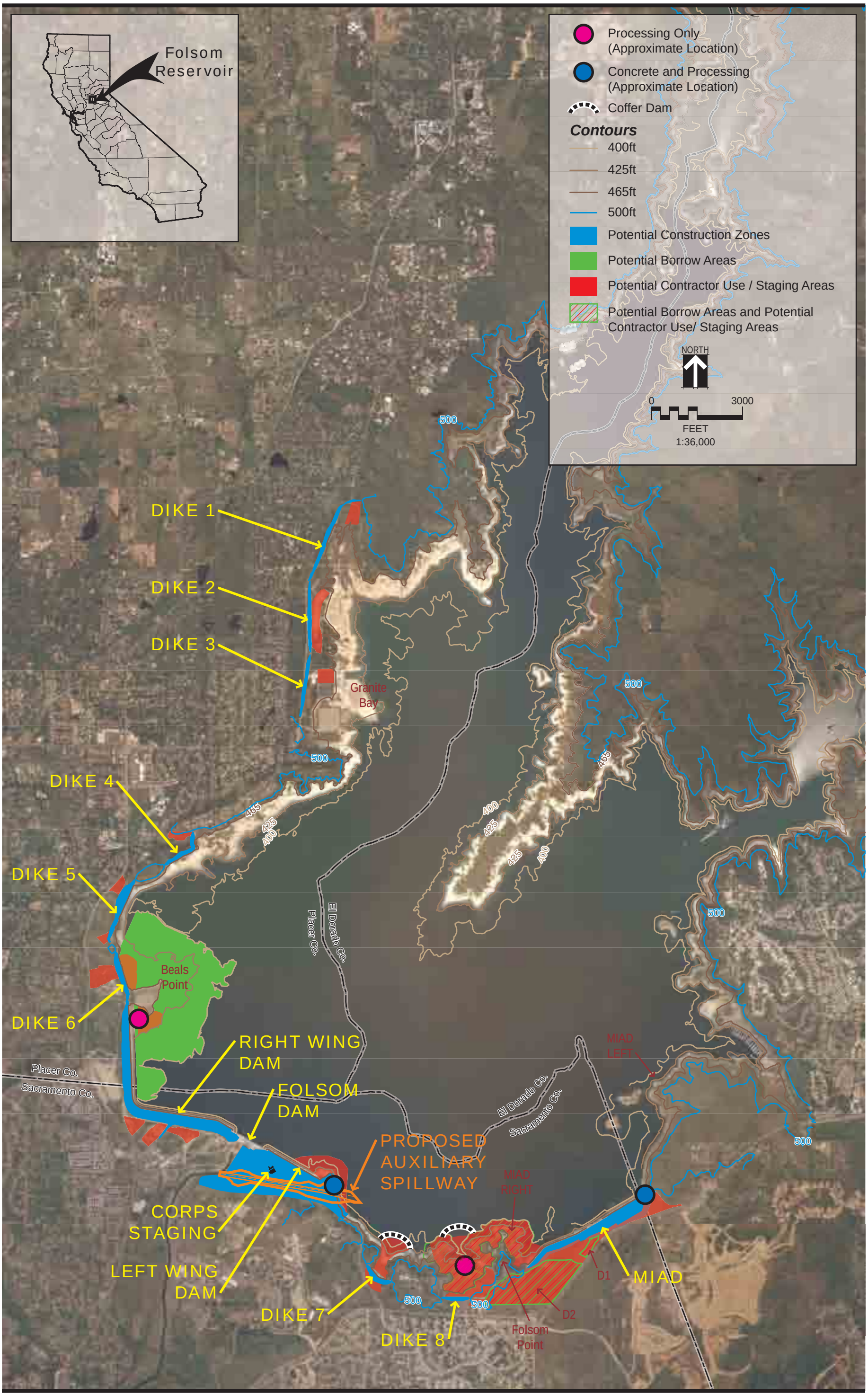

Figure 2-2
Alternative 3, Draft EIS/EIR
Construction Zones

CDM

The haul roads and routes for the revised Preferred Alternative are described below.

a) Auxiliary Spillway to MIAD – This haul route would predominantly follow a portion of Folsom Dam Road closed to public use and the reservoir along the existing shoreline at an elevation below 480.5 ft. The haul road would continue to stock pile locations identified at Dike 7 along the shore line and cross the Folsom Point access road to the stockpile areas near MIAD identified as D1/D2 and near the right groin area of MIAD. The haul route would have haulage access points to the contractor staging areas and stockpile locations identified in Figure 2-3 of this document. Public safety would be maintained via fencing or other similar measures. There would be nearly continuous public access to recreation areas throughout the construction period as outlined in Section 2.5 and Chapter 4 of this document. Specifically in relation to haul routes, Folsom Point, and associated adjacent recreation trails, access would be maintained year-round through the use of traffic control measures and/or grade separated vehicular and/or pedestrian crossings and/or temporary alternate public access detours. Temporary closures could occur when completing construction of the grade separation itself or other access measures or to meet unforeseen project circumstances. In such cases, temporary closures would be accomplished during off-peak days or the off-season to minimize impacts on recreation activities. Reclamation's Central California Area Office will notify local agencies and the general public and accept input in advance of any possible extended closure(s) that may be necessary due to unforeseen project circumstances.

b) Right Wing Dam to Dike 4 – This haul route reflects the above general description by predominantly following existing service roads along the downstream toes of embankments. The haul route would have haulage access points to Dikes 4, 5, 6 and RWD as shown in Figure 2-4 of this document. Public safety would be maintained via fencing or other similar measures. There would be nearly continuous public access to recreation areas throughout the construction period as outlined in Section 2.5 and Chapter 4 of this document. Specifically in relation to haul routes, Beal's Point, and associated adjacent recreation trails, access would be maintained with minimal disruption through the use of traffic control measures and/or grade separated vehicular and/or pedestrian crossings and/or temporary alternate public access detours. Temporary closures could occur when completing construction of the grade separation itself or other access measures or to meet unforeseen project circumstances. In such cases, temporary closures would be accomplished during off-peak days or the off-season to minimize impacts on recreation activities. Reclamation's Central California Area Office will notify local agencies and the general public and accept input in advance of any possible extended closure(s) that may be necessary due to unforeseen project circumstances.

c) MIAD to Hobie Cove – This haul route follows the description presented in b) of this section by predominantly following a previously constructed haul road to Browns Ravine along the shoreline below 480.5 ft, as shown in Figure 2-3 of this document. Public safety would be maintained via fencing or other similar measures. Public recreation access would be maintained year-round, with minimal disruption at Browns Ravine and various recreation trails.

Optimized Borrow

The Draft EIS/EIR discussed the potential for developing borrow sites near each of the Folsom facilities to produce earthen materials for raising structures and additional shell material. The Partner Agencies have determined that the majority of borrow would be produced from the Auxiliary Spillway excavation site, which would reduce the need to develop in-reservoir borrow sites and effects to recreational opportunities. However, both agencies may determine the need to develop other borrow sites for supplemental use (as a contingency); therefore, the potential has been retained in the final project description.

Supplemental borrow site requirements would be limited to in-reservoir areas, between elevation 400.0 and 425.9 ft, north of Beal's Point at an area below Mooney Ridge and the cove area below Dike 8. Also, the Partner Agencies have retained the areas outside the reservoir near MIAD at the D1/D2 area as both a contractor staging area and potential borrow site. Borrow would no longer occur in the immediate vicinity of the Granite Bay or Browns Ravine recreation areas.

Optimization of borrow operations would substantially reduce adverse effects by reducing potential in-reservoir traffic, air quality, recreation and noise impacts on roadways and to communities adjacent to the reservoir, as was presented in the Draft EIS/EIR. Reclamation's Central California Area Office will notify local agencies and the general public and accept input prior to initiating supplemental borrow activities at these sites.

Staging Areas

In response to public comments on the Draft EIS/EIR, the Partner Agencies have reduced the amount of acreage needed for staging purposes by eliminating, consolidating, or reducing acreage from that presented in the Draft EIS/EIR. In principle, contractor staging areas would emphasize use of areas with no current public access, away from residential areas, use of excess materials to create platforms above the normal operating reservoir water surface elevation of 466.0 ft and be placed so as to maintain existing or equivalent public recreation access and use capacity during the peak recreation season. This change, along with other impact reduction measures below would reduce vegetation and wildlife and recreational impacts.

Processing Only
(Approximate Location)

Concrete and Processing
(Approximate Location)

Haul Route

Contours

400ft

425ft

465ft

500ft

Potential Construction Zones

Potential Borrow Areas

Potential Contractor Use / Staging Areas

Seasonal Staging Area

Potential Borrow Areas and Potential
Contractor Use/ Staging Areas

NORTH

0 1250

FEET

1:15,000

RIGHT WING DAM

FOLSOM DAM

LEFT WING DAM

CSALWDE

Overlook Point

PROPOSED AUXILIARY SPILLWAY

CSALWDS

CSAD7N

CSAD8

MIAD Right

MIAD

CSAMIADN

D1

Folsom Point

DIKE 7

CSAD7S

D2

DIKE 8

CSAMIADS

CDM

Figure 2-3
Preferred Alternative,
Auxiliary Spillway to MIAD

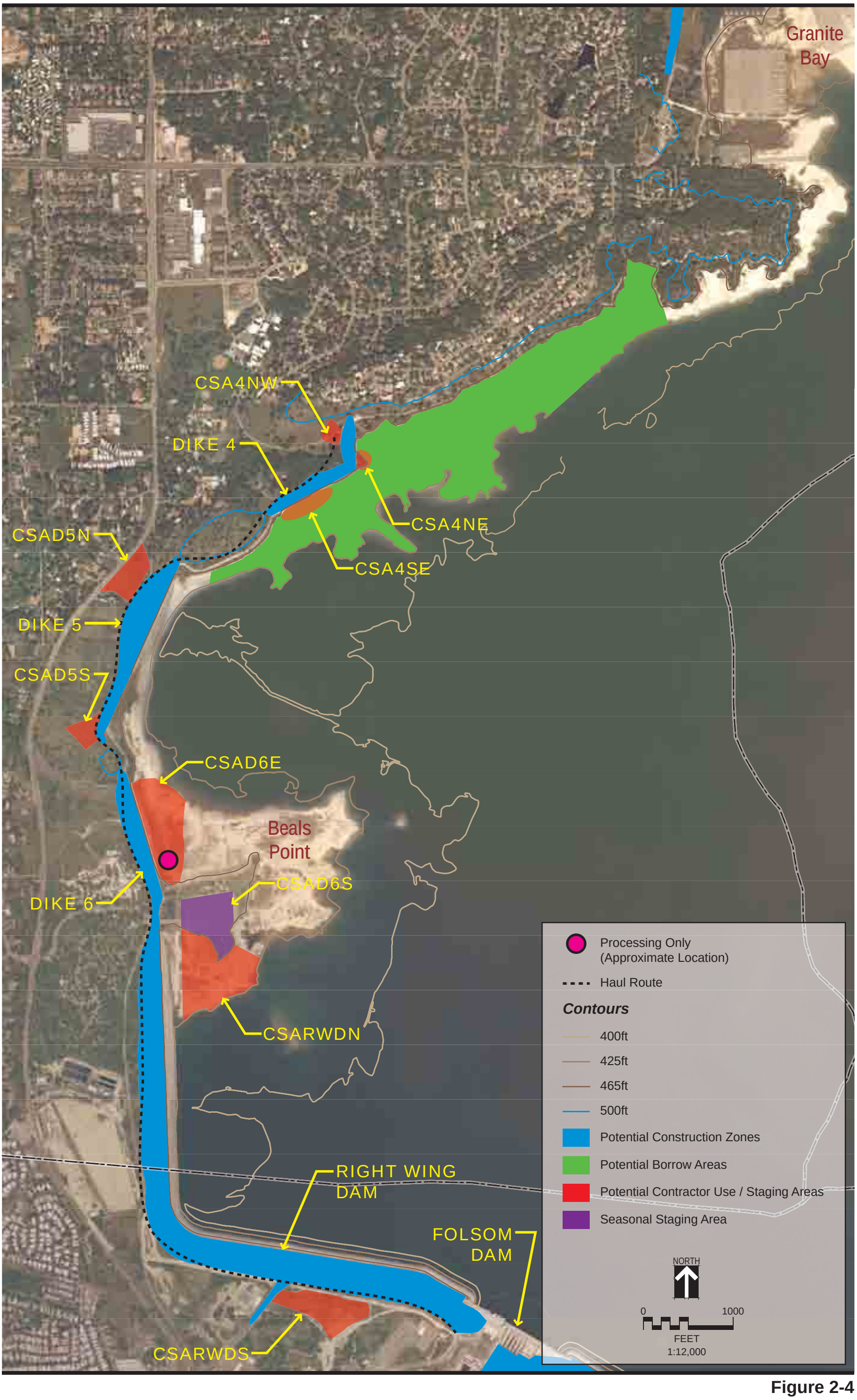

Figure 2-4
Preferred Alternative,
Right Wing Dam to Dike 4

CDM

1) Staging area(s) for work on the RWD at Beal's Point recreation site was removed through construction of a staging platform south of the recreation area.

2) Staging for work at Dikes 4, 5, and 6 would be in the immediate vicinity of the dikes, or would use the platform established south of Beal's Point. These locations would be in areas typically not accessible by the general public and away from residential areas.

3) Staging for work at the Auxiliary Spillway site would potentially be at multiple locations along the toe of the LWD, at the Observation Point, at a constructed platform at Dike 7, and at the D1/D2 location.

4) Staging for work on MIAD would be at the D1/D2 location.

To minimize potential impacts to recreation, staging areas at Beal's Point and Folsom Point would be placed on constructed platforms or on adjacent unimproved areas a safe distance from primary recreational activities. Public safety would be maintained through the use of fencing or other similar measures. There would be nearly continuous public access to recreation areas and trails throughout the construction period through the use of traffic control measures and/or grade separated vehicular and/or pedestrian crossings and/or temporary alternate public access detours. Temporary closures could occur when completing construction of the grade separation itself or other access measures or to meet unforeseen project circumstances. In such cases, temporary closures would be accomplished during off-peak days or the off-season to minimize impacts on recreation activities. Reclamation's Central California Area Office would notify local agencies and the general public and accept input in advance of any possible extended closure(s) that may be necessary due to unforeseen project circumstances.

Cofferdams

The Partner Agencies have eliminated cofferdams proposed at Dikes 7 and 8. This would result in fewer adverse water quality and recreation impacts.

Materials Storage, Processing and Batch Plants

The Partner Agencies currently anticipate that commercial and processed materials (cement, concrete aggregates, sand and gravel, steel etc.) required for the project would be obtained from local commercial off-site suppliers. The revised Preferred Alternative includes the option of conducting processing (crushing and screening) of materials excavated from the new Auxiliary Spillway site, but limits such activity to areas away from residential areas and off limits to public access. The change to the use of commercially acquired materials would reduce air quality, noise, viewshed, and recreational impacts.

The revised Preferred Alternative includes the option to locate materials storage and processing facilities, with the exception of rock crushing equipment, at staging and stockpile areas shown on Figures 2-1, 2-3, and 2-4 of this document. Specifically:

1) The jet grout materials storage and mixing facilities and a materials screening plant at MIAD have been relocated to the staging area D1/D2.

2) Concrete batch and crushing and screening plants – In response to public comments on the Draft EIS/EIR, the option to locate a concrete batch plant at Folsom Point and/or MIAD was eliminated and location of such facilities is now consolidated to sites between the Auxiliary Spillway and the LWD and/or Observation Point areas. This could require relocation of existing structures and/or power lines below the LWD.

2.3 Overview of the Folsom DS/FDR Alternatives

The Draft EIS/EIR discussed five action alternatives and identified Alternative 3 – the JFP Auxiliary Spillway, with a 3.5-ft raise, as the least environmentally damaging alternative. The five original alternatives and their current status, within the context of this Final EIS/EIR are briefly described below.

2.3.1 Alternative 1 – Fuseplug Auxiliary Spillway/No Dam Raise

Alternative 1 differs from the Draft EIS/EIR Alternative 3 principally in that the Auxiliary Spillway dimensions would be shallower and wider and the control structure would be an earthen fuseplug. There would be no raise to any structure for flood water retention or additional freeboard. This alternative has been retained as an executable option in this Final EIS/EIR should the Corps not receive timely funding and/or realize hydrologic risk reduction measures by constructing the 6STG Auxiliary Spillway component of the revised Alternative 3.

2.3.2 Alternative 2 – Fuseplug Auxiliary Spillway with Tunnel/Potential 4-ft Dam Raise

Alternative 2 incorporates a potential 4-ft dam raise with a fuseplug Auxiliary Spillway and gate-controlled tunnel spillway for better hydrologic control of large flood events. This alternative has been eliminated from further consideration.

2.3.3 Alternative 3 – JFP Auxiliary Spillway/3.5-Ft Raise

Alternative 3 is identified in this EIS/EIR as the Preferred Alternative (also termed Proposed Project/Proposed Action). The principle elements of Alternative 3 are a new Auxiliary Spillway controlled by 6 submerged tainter gates, dam safety modifications to the RWD, LWD, Dikes 4, 5, 6 and MIAD, flood damage reduction modifications to the existing emergency spillway gates and a 3.5-ft embankment raise. The revised Preferred Alternative differs from Alternative 3 in the Draft

EIS/EIR in that the 3.5-ft raise, if constructed in conjunction with modification and/or replacement of the three emergency spillway gates and the 6STG Auxiliary Spillway, would only serve as additional freeboard for the Folsom facilities. The raise would not substantially increase the maximum reservoir water surface elevation above 480.5 ft. As a result, under the Corps' Selected Plan, there would no longer be a need for additional flood easements or auxiliary dikes around the reservoir. The 3.5-ft raise, constructed in conjunction with modification and/or replacement of the three emergency spillway gates and the 6STG Auxiliary Spillway, has been identified by the Corps as the Selected Plan within the Corps' PAC report.

Section 2.4.10 below generally describes potential environmental effects of the 3.5-ft raise. Effects were also previously included in the American River Watershed Long-Term Study Final EIS/EIR, February 2002. The 3.5-ft raise portion of the Corps' Selected Plan will undergo further detailed design during the Corps' pre-construction, engineering, and design phase.

Reclamation would implement the dam safety modifications to address seismic and static concerns related to the Main Concrete Dam and six of the eleven earthen structures. Seismic modifications would be made to MIAD through foundation jet grouting in conjunction with a downstream overlay and the reinforcement of Main Concrete Dam existing gates and piers. Static modifications would be undertaken to the RWD and LWD, Dikes 4, 5 and 6 and MIAD. Reclamation would independently identify the final environmental mitigation and commitments for this effort under a stand-alone ROD.

2.3.4 Alternative 4 – JFP Auxiliary Spillway/Potential 7-ft Raise

Alternative 4 contains many of the same elements as Alternative 3 with the exception of a 7-ft raise for increased reservoir flood storage during large flood events. Based upon additional engineering analysis and considering public comments on the Draft EIS/EIR, the Partner Agencies are no longer considering Alternative 4 as a probable alternative.

2.3.5 Alternative 5 – 17-ft Raise

Alternative 5 was specifically developed to address both dam safety and flood damage reduction requirements without the construction of an Auxiliary Spillway. Alternative 5 would involve increased reservoir storage capacity to control large flood events. Based upon additional engineering analysis and considering public comments, Alternative 5 is no longer being considered by the Partner Agencies as a probable alternative.

2.4 Folsom Dam Safety/Flood Damage Reduction Project Description (Revised Alternative 3)

This section describes activities for the Folsom DS/FDR Preferred Alternative, based upon the current sequencing plans for implementing corrective measures at each of the 12 structures of the Folsom Facility (see Table 2-1). The information below describes the general construction features and processes and the basic construction schedule. The text is not a repeat of the project details provided in the Draft EIS/EIR. The reader is referred to Chapter 2 of the Draft EIS/EIR for additional information regarding description of the features, details on quantities, and the activities planned at each of the structures of the Folsom Facility, recognizing that certain information in the Draft EIS/EIR related to elements of Alternative 3 is superseded by the discussion in this Final EIS/EIR.

2.4.1 Activity 1 – JFP Auxiliary Spillway Excavation Phase 1

The first activity, scheduled for the fall 2007, would be initiation of site excavation of the proposed Auxiliary Spillway. Under this phase, a materials haul road would be constructed from the Auxiliary Spillway site at the LWD to the vicinity of MIAD, stockpile and/or staging areas would be set up at the LWD (CSALWDS[2]), Observation Point (CSALWDE), at Dike 7 (CSAD7), and area D1/D2 (CSAMIADN, CSAMIADS) near MIAD. Excavation of up to 860,000 cubic yards (cy) of soil and rock from the Auxiliary Spillway site would occur. The excavated materials would be hauled primarily to area D1/D2 near MIAD as a temporary stockpile. Excess material would be permanently stockpiled at staging/stockpile areas, principally below the LWD (CSALWDS) and the Observation Point (CSALWDE), Dike 7 (CSAD7), in-reservoir at the southern portion of Folsom Point adjacent to the right groin of MIAD (CSAD8), and area D1/D2 (CSAMIADN, CSAMIADS). CSAMIADS and CSAD8 sites could potentially be used for permanent stockpiling should capacity at primary sites below the LWD (CSALWDS) and observation point (CSALWDE) area be insufficient or to meet unforeseen project exigencies. The contractor staging areas (CSAs) described above are shown on Figures 2-3 and 2-4.

The principle work schedule would include a 24 hour work day over two principal productions shifts, 7 days per week. The work shifts would be approximately 12 hours long with ancillary support activities occurring over a 24-hour period. Work activities with significant impacts to residential areas such as noise, dust, and light would be either mitigated by appropriate measures to less than significant and/or limited to traditional working days and hours and/or in conformance with local relevant permit requirements and/or ordinances.

[2] Contractor staging area (CSA) locations as labeled on Figures 2-3 and 2-4.

Haul Road Construction

Off site material transportation would be via off road haul trucks. Through ongoing engineering analysis, the Partner Agencies continue to evaluate equipment size and other conveyance methods to reduce all impacts. Movement of excavated material would involve a substantial number of haul truck round trips. To keep this amount of truck traffic off city streets, a haul road would be constructed primarily on federal property between the maximum high (480.5 ft) and normal operational water levels (425.0 to 466.0 ft) of the reservoir. The haul road would be approximately 40 ft wide and would be maintained to minimize dust production with water and/or dust surfactants. Public safety would be maintained through the use of fencing or other similar measures. Public recreation access would be nearly continuous through measures described in Section 2.5 and Chapter 4 of this document.

This haul road would be in use intermittingly for approximately 8 years during all 3 phases of the Auxiliary Spillway construction. Excavation of the spillway site would not occur continuously for all 8 years of spillway construction work. There would be several periods of time with no excavation. However, this internal road would be used as a general transportation route for traffic between the main concrete dam and MIAD until all work at MIAD has been completed.

Upon completion of construction activities, the haul road would either be regraded to previous contours or partially regraded to provide a platform for future incidental benefit as a recreational trail. Future beneficial improvements may be undertaken by Reclamation under other authorities and/or other parties on approval by Reclamation, subject to future environmental, economic and other required analysis, but does not represent a commitment to provide such improvements as part of this EIS/EIR.

Staging

Initial staging of equipment for the Phase 1 excavation would be at combinations of below the LWD, Observation Point, Dike 7 and adjacent to MIAD at area D1/D2. Staging is primarily required for contractor facilities such as offices, materials and equipment storage and processing facilities. A batch plant would not be required. Processing facilities would be limited to below the LWD, Observation Point, and/or D1/D2.

Excavation

Excavation would be performed using standard earth moving equipment. Approximately one half to one-third of the material to be excavated during Phase 1 is bedrock, which requires drilling and blasting. Drilling and setting of charges would follow an approved blasting plan and permit.

On-site Hauling

Hauling would occur in large off-road haul trucks. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise along haul routes and control fugitive dust emissions with combinations of water, dust control surfactants, and gravel.

Off-site Hauling

With the exception of transport of construction equipment and miscellaneous supporting services to the Auxiliary Spillway site, there would not be a substantial need for hauling of materials to the site during Phase 1. There would be a daily trip for a fueling truck during this phase, as well as for all other phases. The most likely route for the hauling in of construction equipment would be from US 50 using East Bidwell Street to East Natoma Street to Folsom Dam Road.

Stockpiling

Stockpiling would occur primarily at locations near the LWD, Observation Point, Dike 7 and MIAD (identified in Figures 2-3 as CSALWDS, CSALWDE, CSAD7 and CSAD8.) Permanent stockpiling at CSAD7, CSAMIADS, and CSAD8 may occur on a more limited basis if capacity at primary sites is exceeded or to meet unforeseen project exigencies. The majority of this material would be as part of the MIAD overlay (see Activity 6), or would be eventually recontoured as a permanent disposal site following all three phases of Auxiliary Spillway construction.

Processing/Batch Plants

There would not be a need for a concrete batch plant under the Phase 1 excavation work.

Relationship with Recreation Sites

To minimize potential impacts to recreation access and to provide safe access primarily to Folsom Point, the Partner Agencies would implement measures outlined in Section 2.5 and Chapter 4 of this document. Access to FLSRA and trails would be maintained with minimal disruption during the construction of the contractors' haul routes, staging areas, and stockpiling work adjacent to Folsom Point through traffic control measures and/or grade separated vehicular and/or pedestrian crossings and/or temporary alternate public access detours. Temporary closures could occur when completing construction of the grade separation itself or other access measures or to meet unforeseen project circumstances. To the extent practicable, temporary closures would be accomplished off-season or during off-peak days to minimize impacts on recreation activities at Folsom Point. Reclamation's Central California Area Office will notify local agencies and the general public and accept input in advance of any possible extended closure(s) that may be necessary due to unforeseen project circumstances.

Schedule
Contractor mobilization for Phase 1 would start as early as September 2007, with activities lasting 12-18 months with expected completion in 2009.

2.4.2 Activity 2 – Dam Safety Static Upgrades to the Right Wing Dam and Left Wing Dam

The next activity planned under this project would be the proposed dam safety static upgrades to the RWD and LWD, starting in the late fall 2007. This would involve the installation of new filter material within the shells of the downstream faces of both earthen structures. The filter material would be obtained from local sand and gravel suppliers, although crushing and processing of spillway materials has been retained as an option. The existing shell material on the upper 20 ft of the downstream face would be removed, the filter materials installed, and the shell material replaced using standard construction equipment.

Haul Road Construction
Construction of the overlay filters would be conducted along the crest and downstream face of both wing dams. The existing roads on the crest of the dams and along the toe of the dams would be used to support construction. The maintenance road along the toe would require an upgrade (i.e., filling and grading) to handle construction traffic, but no new roads are anticipated to support this activity.

Staging
Staging of equipment for the construction work on the LWD would be at the Observation Point site (CSALWDE) and on the downstream side of the LWD along the toe (CSALWDS). Staging on the downstream side may be limited if the new Folsom Dam Bridge construction is concurrent with the LWD work. Two staging locations would be used for work on the RWD. The first staging area would be constructed south of Beal's Point (CSARWDN), between the parking lot and the RWD. The second staging area would be downstream of the right abutment near the concrete dam (CSARWDS). In order to minimize potential impacts to recreation access and to provide safe access to Beal's Point, the Partner Agencies would implement measures outlined in Section 2.5 and Chapter 4 of this document.

Excavation and Filter Construction
Excavation would be performed using standard earth moving equipment. Shell material would be excavated and stockpiled along the toe or near the abutments of the wing dams while the filters are installed. Local commercial supplies would supply approximately 69,000 cy of fine and coarse filter material to the project sites. Consideration of onsite processed materials from the Auxiliary Spillway is under further evaluation. Filter material deliveries would be scheduled to minimize the need for stockpiling and double handling. The shell material would be replaced once the filter layer is installed.

Off-site Hauling
Hauling of commercially processed material would occur in standard on-road haul trucks. Trucks would access the LWD from US 50 using East Bidwell Street to East Natoma Street to Folsom Dam Road. Trucks would access the RWD from Interstate 80 (I-80) via Douglas Boulevard to Auburn-Folsom Road. Access to the RWD would be from both Beal's Point and Folsom Dam Road. Truck drivers would be instructed to remain on established haul routes to avoid congested and residential areas. To the extent practicable, deliveries would be scheduled for non-commute hours.

Processing/Batch Plants
There would not be a need for processing of excavated materials or a concrete batch plant to complete the filter work at the wing dams.

Relationship with Recreation Sites
In order to minimize potential impacts to recreation access and to provide safe access primarily to Beal's Point, the Partner Agencies would implement measures as outlined in Section 2.5 and Chapter 4 of this document. Construction activities at the RWD may require recreation accommodation measures for Beal's Point. Access to Beal's Point and trails would be maintained with minimal disruption during the construction of the contractors' haul routes, staging areas, and stockpiling work adjacent to Beal's Point through traffic control measures and/or grade separated vehicular and/or pedestrian crossings and/or temporary alternate public access detours. Temporary closures could occur when completing construction of the grade separation itself or other access measures or to meet unforeseen project circumstances. To the extent practicable, temporary closures would be accomplished off-season or during off-peak days to minimize impacts on recreation activities at Beal's Point. Reclamation's Central California Area Office will notify local agencies and the general public and accept input in advance of any possible extended closure(s) that may be necessary due to unforeseen project circumstances.

Schedule
Contractor mobilization would start as early as October 2007 with work completed by November 2008. This activity would overlap with Activity 1 – JFP Auxiliary Spillway Excavation Phase 1.

2.4.3 Activity 3 – Dam Safety Jet Grouting of MIAD Foundation

The third activity would be the stabilization of the foundation at MIAD using a jet grouting process. Start of jet grouting is currently scheduled for summer 2008. Soil borings would be drilled using special drilling equipment. Borings would be drilled through the potentially unstable dredged alluvial or historic alluvial material and then into the underlying bedrock. Once the desired depth is achieved, a concrete-based grout would be injected and extruded into the subsurface using jets along the side of

the drill pipe. The grout would be injected under high pressure into the formation, filling voids. Exploratory borings would be drilled into the grout columns to verify the extent that voids are filled and the grout has set and hardened. The exploratory borings would be backfilled with concrete.

Presently, the Partner Agencies anticipate that approximately 1,360 borings would be drilled for jet grouting purposes. Within each boring, approximately 26 tons of grout would be injected. During grouting, drilling cuttings, water, and grout would be brought to the surface. This waste material would be directed to temporary, lined settling pits for solidification, removal, and disposal. It is anticipated that up to 70 cy of waste material would be generated at each bore hole. This material would be dried and stockpiled on-site. Eventually the dried material would be incorporated into the downstream shell of MIAD (see Activity 6) pending review and approval by the Regional Water Quality Control Board (RWQCB) of chemical inertness tests of the wasted material.

Haul Road Construction

Existing roads within the project site would be utilized. These roads would be upgraded to receive construction traffic, but no new roads will be necessary. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise along haul routes and control fugitive dust emissions by use of combinations of water, dust control surfactants, and gravel. In response to public comments on the Draft EIS/EIR, mitigation requirements identified in Section 2.5.2 would be implemented to control dust and noise.

Staging

Staging of equipment for the jet grouting work would be on federal property downstream of MIAD (CSAMIADN). This area currently has limited recreation use; however, in order to minimize potential impacts to recreation access and to provide safe access to adjacent recreation trails, the Partner Agencies would implement measures outlined in Section 2.5 and Chapter 4 of this document.

Off-site Hauling

Grout material would be hauled to the site in on-road trucks. Although there would be a silo at the site to store some raw material, it is expected that grout deliveries would be at the rate that grout is being injected. Approximately 10 deliveries would be expected each work day. Truck drivers would be instructed to remain on established haul routes to avoid congested and residential areas. To the extent practicable, deliveries would be scheduled during non-commute hours. The most likely traffic route would be from US 50 using East Bidwell Street and Green Valley Road.

Processing/Batch Plants
A grout processing plant would be established at the MIAD staging area. This plant would mix the dry grout, brought to the site in enclosed trailers, with water to a consistency meeting the injection standards. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise during processing and grout plant operations.

Relationship with Recreation Sites
Jet grouting at MIAD is not expected to affect any recreation facilities. This area currently has limited recreation use; however, in order to minimize potential impacts to recreation access and to provide safe access to adjacent recreation trails, the Partner Agencies will implement measures outlined in Section 2.5 and Chapter 4 of this document.

Schedule
Contractor mobilization would start as early as July 2008 with work completed by late fall 2009. This activity would overlap with Activity 1 - Phase 1 of the JFP Auxiliary Spillway excavation and Activity 2 - Dam Safety static upgrades to the RWD and LWD.

2.4.4 Activity 4 – JFP Auxiliary Spillway Excavation Phase 2

Construction of the JFP Auxiliary Spillway and 6STG control structures would be accomplished during three phases. The first phase described above represents the initial excavation and removal of up to 860,000 cy of material. During the second phase, substantially more material, up to 2.0 million cy, would be removed in advance of Phase 3 (see Activity 9). This would involve excavation of the approach channel, control structure, chute, and stilling basin. The material excavated as part of Phase 2 would be substantially rock that requires blasting. One part of Phase 2 would be reinforcing the site slopes using rock bolts, wire mesh, etc., as necessary. Under this phase, the same haul road constructed for Phase 1 would be used to haul material to the Dike 7 and MIAD areas with modifications. Staging areas and materials stockpiling areas would be set up downstream of the LWD, at the Observation Point, at Dike 7, and at the D1/D2 locations.

Haul Road Construction
The existing haul road would be maintained to keep truck traffic on federal property and off city streets. It is anticipated that continuous maintenance of the haul road would be necessary due to the high volume of traffic and material hauled on it.

Principle material distribution is assumed via off road haul trucks; however, through continued engineering analysis, the Partner Agencies continue to evaluate equipment size and other conveyance methods to reduce all impacts. Movement of excavated material would involve a significant number of haul truck round trips. To keep this

amount of truck traffic off city streets, a haul road primarily on federal property (described in Activity 1) would be modified accordingly between the maximum high (480.5 ft) and normal operational water levels (425.0 to 466.0 ft) of the reservoir. The haul road would be approximately 40 ft wide and would be maintained to minimize dust production with water and/or dust surfactants. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise along haul routes and control fugitive dust emissions by use of combinations of water, dust control surfactants, and gravel. Public safety would be maintained via fencing or other similar measures. Public recreation access would be nearly continuously as described in Section 2.5 and Chapter 4 of this document.

Staging

Staging of equipment and materials for the Phase 2 excavation would be primarily at the LWD, Observation Point, and area D1/D2. These areas are away from principle recreation areas; however, to minimize potential impacts to recreation access and to provide safe access to adjacent recreation trails, the Partner Agencies will implement measures outlined in Section 2.5 and Chapter 4 of this document.

Excavation

Excavation would be performed using standard earth moving equipment. The majority of the material to be excavated during Phase 2 is bedrock, which would require drilling and blasting.

On-site Hauling

Hauling would occur in large off-road haul trucks as described in Activity 1. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise along haul routes and control fugitive dust emissions by use of combinations of water, dust control surfactants, and gravel.

Stockpiling

Stockpiling would occur as described in Activity 1.

Off-site Hauling

Iron and steel to stabilize the excavation slopes would be hauled from off-site. Production of concrete would require hauling of cement and gravel to the batch plant site. Hauling of this material would be in standard highway haul trucks. The most likely transportation route from US 50 would be East Bidwell Street to East Natoma Street to Folsom Dam Road. To the extent practicable, deliveries would be scheduled for non-commute hours.

Processing/Batch Plants

This activity may require processing of excavated rock to produce sufficient material for the MIAD overlay. Processing would involve the use of a large material screening device termed a “grizzly.” The grizzly would separate large rocks from

finer materials. The finer materials would then be crushed and screened for use in filters or drains or as part of the MIAD overlay, while the larger materials would be used as riprap along the faces of dikes and wing dams or disposed of permanently at the LWD (CSALWDS), Observation Point (CSALWDE), Dike 7 (CSAD7), and/or D1/D2 (CSAMIADN/S) locations. To produce concrete for the spillway chute, a concrete batch plant would be set up near the spillway site (Observation Point plus the area below LWD) or area CSAMIADN/S. There would be no batch plant at Folsom Point/Dike 8 proper as described in the Draft EIS/EIR. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise during processing and batch plant operations.

Relationship with Recreation Sites
These areas currently have limited recreation use; however, to minimize potential impacts to recreation access and to provide safe access to adjacent recreation trails, the Partner Agencies will implement measures outlined in Section 2.5 and Chapter 4 of this document.

Schedule
Contractor mobilization for Phase 2 would start in September 2010 and continue to January 2014.

2.4.5 Activity 5 – Dam Safety Dike 5 Static Repair

Under Reclamation's Dam Safety Program, Dike 5 would be subject to modifications to control seepage. This would involve placement of a sand filter within the downstream face in a fashion similar to that performed for the wing dams. Existing shell material would be removed, filter material placed, and the shell material replaced, along with additional material from borrow. Trucks would haul filter material to the project site from commercial off-site sources.

Haul Road Construction
The existing maintenance roads along the crest and along the toe of the downstream side of Dike 5 would be improved to receive haul truck traffic. The use of Dike 5 as a recreation trail would be closed for the duration of the construction and a temporary detour would be constructed nearby. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise along haul routes and control fugitive dust emissions by use of combinations of water, dust control surfactants, and gravel.

Staging
Staging would take place near Dike 5 (CSAD5S, CSAD5N) in one of the areas designated for staging. These areas currently have limited recreation use; however, to minimize potential impacts to recreation access and to provide safe access to adjacent recreation trails, the Partner Agencies would implement measures as outlined in Section 2.5 and Chapter 4 of this document.

Excavation
The Partner Agencies assume that material stockpiled from the Auxiliary Spillway may be used for supplemental shell material. In the event of unforeseen circumstances, shell material for Dike 5 could be excavated from the reservoir shoreline, north of Beal's Point below Mooney Ridge. Supplemental borrow site requirements would limited to in-reservoir areas, between elevation 400.0 and 425.9 ft, north of Beal's Point at an area below Mooney Ridge and the cove area below Dike 8.

Optimization of borrow operations would substantially reduce the adverse effects presented in the Draft EIS/EIR by reducing potential in-reservoir traffic, air quality, recreation and noise impacts on roadways and to communities adjacent to the reservoir. Reclamation's Central California Area Office will notify local agencies and the general public and accept input prior to initiating supplemental borrow activities at this sites.

On-site Hauling
As needed, supplemental excavated material from either the Auxiliary Spillway, various stockpiles and/or the reservoir area borrow below Mooney Ridge would be transported directly to the Dike 5 project site using an internal construction road. Traffic would be separated from public either through a grade separation or via a controlled, secured intersection with a traffic control measure, public detour, or other engineered mechanism.

Off-site Hauling
Processed material for filters and drains would be obtained from a local commercial source or sources. Auburn-Folsom Road would be used as the primary artery for commercial material transport.

Materials Screening
There would not be a need for rock crushing and/or a concrete plant at Dike 5. If necessary to produce material of proper size for additional shell material for the Dike 5 modifications, a materials separating plant (grizzly and screening only) would be established north of Beal's Point. This plant would separate large rocks from finer material. The large rocks would be placed near the processing site and the finer material hauled to Dike 5.

Relationship with Recreation Sites
Beal's Point or the Dike 5 access road would be the primary access point for Dike 5 work. In order to minimize potential impacts to recreation access and to provide safe access to adjacent recreation trails, the Partner Agencies would implement measures outlined in Section 2.5 and Chapter 4 of this document.

Schedule
Contractor mobilization would start in September 2009 with the majority of the work accomplished during the winter. Completion is expected in May 2010. This activity would overlap for several months with the completion of Activity 3 – Dam Safety Jet Grouting of MIAD Foundation.

2.4.6 Activity 6 – Dam Safety MIAD Overlay

To address seismic concerns for dam safety of this earthen structure, an earthen overlay would be constructed on the downstream side of MIAD. This activity would involve excavation of a portion of the downstream fill, placement of a filter layer, replacement of shell, and placement of an overlay of approximately up to 2 million cy. The material for the overlay would be obtained from the D1/D2 stockpile site (material originally excavated from the Auxiliary Spillway site and waste material from the jet grouting program). Filter material would be transported from an off-site commercial source or processed at the Auxiliary Spillway.

Haul Road Construction
The Partner Agencies would construct a haul road from the stockpile for trucks to haul overlay material to MIAD.

Staging
Staging of equipment and materials would be at the CSAMIADN/S locations and at the downstream toe of MIAD.

On-site Hauling
Trucks would haul overlay material from the CSAMIADN/S locations using internal construction roads.

Off-site Hauling
For filter material obtained from a local commercial source or sources, East Bidwell and Green Valley Road would be used as the primary artery for transport from US 50.

Processing/Batch Plants
Though not anticipated in Auxiliary Spillway Excavation Phase 2, the Partner Agencies retain an option to process material via rock crushing and screening at the Auxiliary Spillway site. If a commercial source is not available, the material for the overlay would be obtained from already processed materials as part of the Auxiliary

Spillway Phase 2 excavation. No concrete batch plant would be required. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise during processing and batch plant operations.

Relationship with Recreation Sites
The trail along the top of MIAD would be closed to foot traffic during the construction period and alternate access to trails will be provided where practical. In order to minimize potential impacts to recreation access and to provide safe access to adjacent recreation trails, the Partner Agencies will implement measures outlined in Section 2.5 and Chapter 4 of this document.

Schedule
Contractor mobilization would start in the summer 2015 and continue until the spring 2017.

2.4.7 Activity 7 – Dam Safety Dikes 4 and 6 Static Repair

To address Dam Safety concerns, both Dikes 4 and 6 would receive static control modifications consisting of sand filter upgrades as described for Dike 5. This repair would involve placement of a filter within the downstream face in a fashion similar to that performed for Dike 5. Existing shell material would be removed, filter material placed, and the shell material replaced, along with additional material from borrow. Filter material would be hauled to the project site from off-site sources. Supplemental additional shell material would be excavated from the reservoir shoreline, north of Beal's Point. Staging would be adjacent to each dike in areas identified for that purpose.

Haul Road Construction
The Partner Agencies would improve the existing maintenance roads along the crests and along the toes of the downstream portions of Dikes 4 and 6 to receive haul truck traffic. The recreational trails affected by the truck traffic would be relocated to allow the trails to stay open during construction. The use of Dike 5 as a recreation trail would be closed for the duration of the construction and a temporary detour would be constructed nearby.

Staging
Staging of equipment and materials would be adjacent to each dike (see locations CSAD4NW, CSAD4NE, CSAD4SE, and CSAD6E.)

On-site Hauling
Excavated material from either the Auxiliary Spillway site or – as circumstances require – the reservoir area borrow north of Beal's Point would be transported directly to each dike using internal construction roads.

Off-site Hauling
Filter material would be obtained from a local commercial source or sources. Trucks would use Auburn-Folsom Road as the primary artery for commercial transport.

Materials Screening
There would not be a need for a concrete plant to support work at either dike. If necessary to produce material of proper size for additional shell material, a materials separating plant (grizzly and or screening only) could be established north of Beal's Point. This plant would separate large rocks from finer material. The large rocks would be placed near the processing site(s) and the finer material hauled to Dikes 4 and 6. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise during processing operations.

Relationship with Recreation Sites
Beal's Point would be the primary access point for Dike 4, 5 and 6. For Dike 4 and 5 staging areas would be utilized that are separated from the principle recreation areas; however, to minimize potential impacts to recreation access and to provide safe access to adjacent recreation trails, the Partner Agencies will implement measures outlined in Section 2.5 and Chapter 4 of this document. Dike 6 is in very close proximity to Beal's Point and the intersection of numerous trails and recreational facilities. Access to Beal's Point and trails would be maintained with minimal disruption during the construction of the contractors' haul routes, staging areas, and stockpiling work through traffic control measures and/or grade separated vehicular and/or pedestrian crossings and/or temporary alternate public access detours. Temporary closures could occur when completing construction of the grade separation itself or other access measures or to meet unforeseen project circumstances. To the extent practicable, temporary closures would be accomplished off-season or during off-peak days to minimize impacts on recreation activities at Folsom Point. Reclamation's Central California Area Office will notify local agencies and the general public and accept input in advance of extended closure(s).

Schedule
Contractor mobilization would start in September 2017 with the majority of the work to be accomplished during the winter to minimize recreation impacts. Completion is expected for April 2018.

2.4.8 Activity 8 – Dam Safety Main Concrete Dam Seismic Improvements and Repairs

To provide better seismic stability and to upgrade the spillway gates and piers for dam safety, the Main Concrete Dam would be subject to a series of improvements. These include installation of tendons through the spillway piers into the Main Concrete Dam's monoliths to tie the piers and monoliths together, installation of steel members to the spillway piers, and modifications to the spillway gates.

Pier Tendon Installation
Tendons would be installed through the piers by drilling a borehole into the concrete blocks, inserting the tendon, and grouting the tendon in place. After drilling the hole, the tendon would be inserted, anchored, and tensioned. The tendon and hole would then be grouted to the surface. There are 6 tendons anticipated per pier and 7 piers that require anchoring.

Spillway Pier Wraps and Braces
The pier wraps and braces would consist of installation of steel plates on the existing piers and steel braces between the piers. This would involve drilling for insertion of bolts. This work would not involve substantial staging areas or cause haul truck issues.

Spillway Gate Modifications
Work on the spillway gates would involve structural modifications and metal plate bracing. This work would not involve substantial staging area or cause haul truck issues.

Haul Road Construction
The existing dam maintenance roads would be used to access the project sites.

Staging
Staging of equipment and materials would be at CSALWDS.

Off-site Hauling
Off-site hauling would include the tendons, grout material, braces, metal plates, and miscellaneous supplies such as bolts.

Processing/Batch Plants
A small grout mixing plant would be established near the Main Concrete Dam at one of the established staging areas to produce grout for the tendon installation. No other processing would be required.

Relationship with Recreation Sites
There would not be a need to close recreation sites for this work. The work area is inaccessible to the public.

Schedule
Work on the pier tendons is scheduled to start in January 2014 and would take approximately 14 months. Work on the spillway pier wraps and braces would start in August 2016 and take approximately 20 months to complete. The spillway gate repairs would start in January 2018 and take over 2.5 years.

2.4.9 Activity 9 – JFP Auxiliary Spillway Excavation Phase 3

Phase 3 would involve construction of the JFP Auxiliary Spillway's approach channel, control structure, chute, and stilling basin. This includes the removal of approximately up to 500,000 cy of material to excavate the approach channel and control structure that would house the submerged tainter gates. A substantial amount of concrete would be required to construct and line the approach channel, control structure, spillway chute, and stilling basin. Under this phase, the same haul road constructed for Phase 1 would be used to haul material to the Observation Point, Dike 7, and D1/D2 areas. Staging areas would be set up near the spillway site and/or at D1/D2. Activity 9 represents the completion of the 6STG portion of the Corps' Selected Plan. The Corps continues to evaluate design criteria.

Haul Road Construction
The existing haul road would be maintained to keep truck traffic on federal property and off city streets. It is anticipated that continuous maintenance of the haul road would be necessary. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise along haul routes and control fugitive dust emissions by use of combinations of water, dust control surfactants, and gravel.

Staging
Staging of equipment and materials for the Phase 3 excavation would be primarily at the LWD (CSALWDS), Observation Point (CSALWDE), and MIAD (CSAMIADN/S) areas. These areas are away from principle recreation areas; however, to minimize potential impacts to recreation access and to provide safe access to adjacent recreation trails, the Partner Agencies would implement measures outlined in Section 2.5 and Chapter 4 of this document.

Excavation
Excavation would be performed using standard earth moving and dredging equipment.

On-site Hauling
Hauling would occur in large off-road haul trucks. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise during processing and batch plant operations.

Stockpiling
Stockpiling would primarily occur at the Observation Point area. The majority of this material would be either used as part of a permanent stockpile, or the stockpile site eventually would be recontoured as a permanent disposal site.

Off-site Hauling
Production of concrete would require hauling of commercially sourced cement and gravel to the batch plant site near the Auxiliary Spillway construction site. Hauling of this material would be in standard highway haul trucks.

Processing/Batch Plants
To produce concrete for the spillway approach and control structure, a concrete batch plant would be set up near the spillway site and/or Observation Point and/or D1/D2. To the extent practicable, the Partner Agencies would use natural topography and stockpiled materials to reduce noise during processing and batch plant operations.

Relationship with Recreation Sites
These areas are separated from principle recreation areas; however, to minimize potential impacts to recreation access and to provide safe access to adjacent recreation trails, the Partner Agencies would implement measures outlined in Section 2.5 and Chapter 4 of this document.

Schedule
Contractor mobilization for Phase 3 would start during the fall 2011 and continue into the late fall 2014.

2.4.10 Activity 10 – Flood Damage Reduction 3.5-ft Raise of Dam Structures

The last activity related to flood damage reduction actions would be modification and/or replacement of the existing emergency spillway gates and a 3.5-ft raise of all embankments using either a parapet wall design on top of all facilities or through an earthen raise. Relative to the revised Preferred Alternative, this 3.5-ft raise would be to provide additional freeboard capacity and is not necessary to raise the reservoir surface water elevation as related to flood damage reduction objectives. The parapet wall raise is described below and potential environmental effects of the raise are discussed generally in this document and in the American River Watershed Long-Term Study Final EIS/EIR, February 2002. Activity 10 represents the completion of the additional flood damage reduction portions of the Corps' Selected Plan as identified in the PAC Report. The Corps continues to evaluate design criteria during the Corps' pre-construction, engineering, and design phase.

The parapet wall raise would involve excavating a small portion of the top of each earthen structure to receive the base of the parapet wall, constructing forms to receive cement, pouring the cement, removing the forms for the next construction length, and replacing/backfilling of filter and removing shell material. Existing maintenance roads would be used to access the construction sites; there would not be a need for new roads. Staging would be conducted at each site.

Haul Road Construction
There would not be a need for haul roads for the embankment raise.

Staging
Staging would occur adjacent to each earthen structure.

Excavation
Excavation of the crown of each dike and wing dam would be performed using standard earth moving equipment. One daylight shift is anticipated on a 5 day per week schedule.

On-site Hauling
Any hauling of materials on-site would be in smaller, on-road type vehicles.

Stockpiling
Temporary stockpiling of materials would occur adjacent to each facility.

Off-site Hauling
Concrete for the parapet walls would be produced at a commercial site batch plant and hauled to the project site in rotary concrete trucks. There would not be concrete production at the site. If an earthen raise is done, material needed for construction would be hauled to the project site from a commercial source.

Processing/Batch Plants
There would not be a need for a concrete batch plant at the site.

Schedule
Contractor mobilization for the parapet wall raise would start in May 2010 and continue to June 2014. The smaller facilities such as Dikes 1, 2, and 3, would require several weeks to install the parapet wall. Larger facilities, such as the RWD, would require several months.

2.4.11 Ancillary Actions

There are several actions related to the Folsom DS/FDR project that have not been completely defined at this time. These actions include dredging mechanism for the spillway approach channel construction and new Auxiliary Spillway stilling basin construction.

Spillway Approach Channel Construction
Construction of portions of the approach channel to the new Auxiliary Spillway would require "wet" work below the water level of the reservoir. It is anticipated that some form of dredging would be required to excavate some of the material. The specific dredging method and materials handling processes are not known at this time. The detailed design on the spillway approach channel, including dredging and

materials handling, would be determined in the Corps' pre-construction, engineering, and design phase and if needed, supplemental NEPA/CEQA documentation would be prepared.

Auxiliary Spillway Stilling Basin

The new Auxiliary Spillway would require a stilling basin at the point where the channel would enter the American River. Details regarding the stilling basin and how it would be constructed are currently being refined by Reclamation. Reclamation would issue a supplemental environmental document on the construction of the stilling basin if needed, in consultation with National Marine Fisheries Service and the USFWS once those details are known.

2.5 Commitments

This section presents the environmental commitments proposed by the Folsom DS/FDR Partner Agencies.

2.5.1 Recreation Mitigation Limitations

Reclamation under the authority of the Safety of Dams Act, under which Reclamation exercises its authority to make the proposed Folsom Facility improvements, can mitigate for damages to recreation facilities and take actions to ensure recreational access is maintained, but it cannot provide additional recreational benefits (i.e., Reclamation cannot provide recreational enhancements). Reclamation and the Corps authorities related to recreation include but are not limited to:

1) Section 4, 1944 Flood Control Act (P.L. 78-534) as amended, Federal Water Project Recreation Act 1965 (P.L. 89-72) as amended;

2) Section 103(c)(4) and 103(e) Water Resources Development Act 1986 as amended; and

3) Reclamation Projects Authorization and Adjustments Act, Section 2804 (P.L. 102-575).

As public stewards of the Federal interests and property of which the project is being undertaken, Reclamation and the Corps acknowledge the potential exists in the future to provide new beneficial recreational or other improvements that could be made to remnant unimproved platforms following completion of project construction. Such potential improvements are viewed at this time as being consistent with conceptual plans put forth in the Draft Folsom Lake State Park Resource Management Plan and with other local recreation plans. These plans are conceptual in nature at this time and are not funded and/or approved plans and not considered an existing project future condition and thus are not required to be considered as offsetting mitigation for potential impacts. Future beneficial

improvements may be undertaken by Reclamation under other authorities and/or by the Corps or other parties on approval by Reclamation, subject to future environmental, economic and other required analysis but does not represent a commitment to provide such improvements as part of this EIS/EIR.

2.5.2 Folsom DS/FDR Mitigation Commitments

Table 2-2 identifies mitigation commitments as part of the Folsom DS/FDR. These commitments relate to potential environmental impacts of the actions that would occur under the Preferred Alternative.

2.6 Unresolved Issues

Some actions have not been fully defined in this project description primarily because engineering methods have not been determined. These actions include the spillway approach channel, the Auxiliary Spillway stilling basin, a 3.5-ft raise, and grade separation activities at Beal's Point. Reclamation and/or the Corps will supplement these actions, as needed, to comply with CEQA and NEPA, as further described below.

The dredging mechanism for the spillway approach channel construction is currently not known. Methods could involve in-reservoir excavation, which could result in additional environmental impacts. The detailed design on the spillway approach channel including dredging and materials handling would be determined in the Corps' pre-construction, engineering, and design phase and if needed, supplemental NEPA/CEQA documentation would be prepared.

The new Auxiliary Spillway would require a stilling basin at the point where the channel would enter the American River. Details regarding the stilling basin and how it would be constructed are currently being refined by Reclamation. Reclamation would issue a supplemental environmental document on the construction of the stilling basin if needed, in consultation with National Marine Fisheries Service and the USFWS once those details are known.

The engineering for the 3.5-ft raise is currently not determined and could include a parapet wall or an earthen raise. In conjunction with the raise, additional hydrologic evaluation of Dike 1 would need to occur. The detailed design on the 3.5-ft raise including dredging and materials handling would be determined in the Corps' pre-construction, engineering, and design phase and if needed, supplemental NEPA/CEQA documentation would be prepared.

Grade separation activities at Beal's Point could occur to maintain access for recreational activities. Currently, a technique for grade separation, including the route and alignment are not known. Supplemental NEPA/CEQA documentation may be necessary to evaluate environmental impacts of grade separation actions.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]	*List of Mitigation Measures for each Resource*[4]
Hydrology/Water Quality /Groundwater			
Construction-related activities related to earth moving operations, storage and handling of construction materials on site, and operation and maintenance of construction equipment and vehicles could affect water quality within the reservoir or small local tributaries leading to the reservoir. Soil erosion associated with excavating material and re-grading may transport sediment into local tributaries or directly into the reservoir.	HWQ-1, HWQ-2, HWQ-3, HWQ-9	LTS	**HWQ-1**: The responsible Federal Agency working with their Construction Contractor will obtain an NPDES permit prior to construction activities, commencing by filing a Notice of Intent (NOI) with the Central Valley Regional Water Quality Control Board (CVRWQCB} and preparing a Stormwater Pollution Prevention Plan (SWPPP).
			HWQ-2: The responsible Federal Agency working with their Construction Contractor will incorporate measures to control on-site spills in the SWPPP. In addition to the spill prevention and control Best Management Practices (BMPs) presented above, the SWPPP will contain a visual monitoring program and a chemical monitoring program for pollutants that are non-visible to be implemented if there is a failure of BMPs.
Jet grouting at the downstream foundation of MIAD would affect water quality.	HWQ-4, HWQ-5, HWQ-6, HWQ-7, HWQ-8	LTS	**HWQ-3:** The responsible Federal Agency working with their Construction Contractor will prepare and obtain permits abided by as stated in Section 401 and Section 404 of the Clean Water Act (CWA) regarding dredging or filling of waters of the United States, and activities involving discharging into those waters, which include wetlands, respectively.

[3] LTS = Less than significant with mitigation.
[4] Unless otherwise specified, for mitigation measures that refer to "responsible Federal agency", the Corps is responsible for impacts and corresponding mitigation related to flood damage reduction construction activities; for all other construction-related project impacts and corresponding mitigation, Reclamation is the responsible Federal agency.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]	*List of Mitigation Measures for each Resource*[4]
Jet grouting at the downstream foundation of MIAD would reduce the water source for a portion of the wetlands.	HWQ-5	LTS	**HWQ-4**: Reclamation will perform jet grouting tests at Mormon Island Auxiliary Dam (MIAD) prior to implementing the full jet grouting action, including the monitoring for any grout leakages as well as the testing of groundwater and surface water levels and quality. If Reclamation determines that leakages are expected to occur and could cause adverse water quality effects, they will construct a cutoff wall before they jet grout the foundation at MIAD that will eliminate the migration of the grout, metals released from sediments and pH12 water impacts to surrounding waters.
Construction actions such as in-reservoir dredging would cause adverse water quality effects from mercury and metals in the reservoir.	HWQ-12, HWQ-13	LTS	**HWQ-5:** Reclamation will monitor surface and groundwater levels and water quality prior to, during, and after jet grouting or excavation and replacement of MIAD.
Excess material placed in the reservoir would cause adverse water quality effects.	HWQ-1, HWQ-2, HWQ-3, HWQ-9, HWQ-14	LTS	**HWQ-6:** The Reclamation Construction Contractor will be instructed to cease work should jet grout daylight more than 50 ft from the point of construction or until it can be determined that the grout will remain localized.
Dewatering the existing Stilling Basin could cause adverse water quality effects.	HWQ-11	LTS	**HWQ-7:** Reclamation will visually inspect all wetlands near jet grout injection that could be impacted by construction for the presence of grout at a frequency of every 15 to 30 minutes.
			HWQ-8: The Reclamation Construction Contractor will line all temporary jet grout solidification areas with an impervious material that does not allow the migration of any construction-related wastes.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]	*List of Mitigation Measures for each Resource*[4]
			HWQ-9: The Responsible Federal Agency will obtain guidance from the CVRWQCB for testing earthen materials before constructing work area platforms within or adjacent to the reservoir. This is to ensure that any potentially-associated pollutants will not be introduced into the reservoir that would violate water quality standards or substantially degrade existing water quality. Fill material will be placed in the reservoir during periods of lower water elevation, when possible. Best management practices will be adhered to in order to minimize water quality impacts during the placement of fill in the reservoir.
			HWQ-11: The Corps will obtain a dewatering permit from CVRWQCB and will implement applicable water quality monitoring during dewatering of the existing Stilling Basin.
			HWQ-12: The Responsible Federal Agency will develop mitigation measures in consultation with CVRWQCB staff to minimize water quality impacts. These measures may include placement of a silt curtain surrounding the construction zone or construction of coffer dams. If appropriate, routine water samples will be collected at the start and completion of each dredging and/or blasting period.
			HWQ-13: During the process of dredging material to construct the approach channel for the Auxiliary Spillway, sediment containing mercury will be controlled using a variety of methods, including, but not limited to, silt curtains, silt fences, as well as other BMPs and construction methods approved by the CVRWQCB. Dredged material will be placed on the downstream side of the reservoir in a contained area for drying and processing. The dredged material will then be contained either in the MIAD overlay or transported to a permanent disposal site outside of the reservoir.
			HWQ-14: The Responsible Federal Agencies will develop a water quality monitoring plan for review by the CVRWQCB prior to any in reservoir construction work. The plan will address sampling requirements during dredging, blasting, excavation, and placement of fill within the reservoir. If turbidity readings exceed action level values established by the CVRWQCB, corrective actions will be implemented in accordance with the plan.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]		*List of Mitigation Measures for each Resource*[4]
Water Supply				
The relocation of a 300-ft segment of the Natomas Pipeline to an above ground pipeline would temporarily interrupt water supplies to the City of Folsom and California Department of Corrections water treatment plants.	WS-1	LTS		**WS-1**: The Responsible Federal Agencies working with their Construction Contractors will construct a temporary bypass using means (e.g., a temporary, scheduled disruption, using a bypass pipeline) that will not disrupt water supply. These means will be discussed with CCAO and the CCAO area manager, the City of Folsom, and California Department of Corrections prior to implementation.
Air Quality				
Stationary Source Mitigation Options: The stationary sources associated with the Folsom DS/FDR would include the concrete batch plant(s) and material crushing/processing facilities. Because these plants would be subject to air quality permitting by one or more of the local air districts with assumed emissions reduction requirements.	AQ-1, AQ-2	LTS		**AQ-1**: The Responsible Federal Agencies, including CCAO and CCAO area manager, will seek opportunities to tie facility power to the electric utility grid, in lieu of diesel-driven generators and pumps. Using grid power eliminates both the gaseous pollutants associated with diesel engines, as well as diesel particulate matter which is a listed toxic air contaminant in California.
Mobile Source Mitigation Options: Construction equipment emissions would exceed air quality standards. The standard CEQA mitigation measures for construction equipment emissions are provided in SMAQMD, 2004	AQ-3, AQ-4	LTS		**AQ-2**: If deemed appropriate, the Responsible Federal Agencies in conjunction with their Construction Contractors will institute a wet suppression test used to reduce plant dust emissions. For this analysis, the controlled emissions are based on AP-42 controlled emission factors for batch plants and crushing facilities. These controls are included as part of the Folsom DS/FDR design for the stationary plants. The emissions for these units will be refined as the design is firmed up for air quality permitting and eventual operation.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]	*List of Mitigation Measures for each Resource*[4]
NOx Mitigation Options: Construction equipment emissions would exceed air quality standards. Several mitigation options that may be applicable to mobile construction equipment engines to reduce NOx emissions are described below. The specific measures to be employed will be based on discussions with the SMAQMD.	AQ-5, AQ-6, AQ-7	LTS	**AQ-3**: The Responsible Federal Agencies (working with their Construction Contractors as appropriate) will provide a plan for approval by SMAQMD, demonstrating that the heavy-duty (> 50 horsepower) off-road vehicles to be used in the construction project, including owned, leased and subcontractor vehicles, will achieve a project wide fleet-average 20 percent NOx reduction and 45 percent particulate reduction compared to the most recent CARB fleet average at time of construction
PM 10 Mitigation Options: Construction activities, materials processing, and materials hauling will produce fugitive dust above air quality standards	AQ-8	LTS	**AQ-4**: The Responsible Federal Agency working with their Construction Contractor will submit to the SMAQMD a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that will be used an aggregate of 40 or more hours during any portion of the construction project. The inventory shall include the horsepower rating, engine production year, and projected hours of use or fuel throughput for each piece of equipment. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative shall provide SMAQMD and the CCAO area manager with the anticipated construction timeline including start date, and name and phone number of the project manager and on-site foreman.
			AQ-5: The responsible Federal Agency in conjunction with their Construction Contractors will evaluate the potential use of emulsified or aqueous diesel fuel could theoretically be applied to all diesel equipment operating at the site. The evaluation would be making a decision whether this would be the only diesel fuel purchased for the Folsom DS/FDR action. It is anticipated that equipment fueling would occur onsite with a fuel depot and/or mobile fueling trucks. It is assumed that aqueous diesel fuel would provide a 14 percent reduction NOx emissions as well as a 63 percent reduction of engine exhaust PM10 emissions, consistent with the control efficiencies incorporated in the URBEMIS2002 model.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]		*List of Mitigation Measures for each Resource*[4]
				AQ-6: The responsible Federal Agency working with their Construction Contractors will evaluate the use of equipment with engines that incorporate exhaust gas recirculation (EGR) systems. EGR systems may need to be part of the engine design for a substantial portion of the existing construction equipment fleet in the region to be effective. While EGR systems can provide reductions of NOx, PM10, CO, and VOC emissions, it is not likely that enough available construction equipment have EGR engines to provide any real reductions for the Folsom DS/FDR action. However, the availability of construction equipment with EGR systems will need to be reviewed in detail prior to the final decision to incorporate or drop this option from the MMRP for the proposed action.
				AQ-7: The responsible Federal Agency working with their Construction Contractors will evaluate the installation of a lean NOx catalyst in the engine exhaust system. Lean NOx catalyst filters may be available for construction equipment exhaust. However, these units would need to be certified by CARB before being installed on specific construction equipment engines. In addition, other add-in exhaust filters are not compatible with aqueous diesel fuel. Therefore, aqueous fuel use and lean NOx catalysts may be mutually exclusive mitigation options. Again, a detailed review of applicable catalysts and compatibility with different fuels will need to be conducted before a final decision can be made to incorporate in or drop this option from the MMRP.
				AQ-8: The responsible Federal Agency working with their Construction Contractors will apply fugitive dust control to reduce PM10 and PM2.5 emissions. Typical dust mitigation measures include: • Wet suppression and soil stabilization • Wind fencing around active area • Paving on-site roadways • Truck wheel washing facilities at site exits onto public roadways • Maintaining minimum truck bed freeboard or covering haul truck beds
Terrestrial Vegetation and Wildlife				

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]	*List of Mitigation Measures for each Resource*[4]
Construction may have direct or indirect impacts to special-status plant species.	BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-7, BIO-11	LTS	**BIO-1**: A biologist qualified for the respective survey will conduct pre-construction surveys within the project footprint in areas that may contain suitable habitat for special-status plant, invertebrate, or wildlife species. The biologists would identify locations of special status plant, invertebrate, or wildlife species and take necessary measures to provide protection.
There would be direct or indirect impacts to protected oak woodlands.	BIO-1, BIO-2, BIO-4, BIO-7, VEG-1	LTS	**BIO-2:** To the extent consistent with project implementation needs, the Responsible Federal Agencies working with their respective Construction Contractors will avoid any populations of special-status plant, invertebrate, or wildlife species by placing fencing around the population and a suitable buffer area. Environmental monitors employed either by the Responsible Federal Agency or their Construction Contractor will regularly inspect any fenced sensitive biological resources to ensure no disturbance.
There could be direct or indirect impacts (death, harassment, disturbance, noise) to special-status wildlife species, including amphibians, reptiles, birds, and mammals, or their habitat due to temporary or permanent alteration of terrestrial habitat through construction, development of borrow sites, and placement of fill.	BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-7, BIO-9, BIO-11, AMP-1	LTS	**BIO-3:** The responsible Federal Agency will consult with USFWS and CDFG should populations of special-status plant, invertebrate, or wildlife species be found that cannot be avoided; special mitigation measures may need to be developed for those populations.
Borrow site excavation and other construction activities could result in sedimentation in streams, creeks and seasonal wetlands.	BIO-6, BIO-7	LTS	**BIO-4:** All construction personnel at the Folsom DS/FDR construction site would receive environmental awareness training from Responsible Federal Agency biologist(s) associated with the project, or suitably trained representative(s), regarding the potential presence of listed, special-status, and protected (e.g., oak trees) species in the project area and the importance of avoiding impacts to these species and/or habitats and reporting sightings.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]	*List of Mitigation Measures for each Resource*[4]
Borrow site excavation and other construction activities could result in direct mortality to nesting birds protected by the Migratory Bird Treaty Act.	BIO-11 WIL-1, BRD-1, BRD-2	LTS	**BIO-5:** The responsible Federal Agencies will develop a Revegetation Plan to address potential losses to all habitats impacted within the project footprint. The Revegetation Plan will be implemented immediately following construction in accordance with requirements in the SWPP, FWCAR, and Mitigation, Monitoring, and Reporting Plan (MMRP).
Adverse effects to wildlife could result from underwater blasting.	BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-11	LTS	**BIO-6**: The Construction Contractor will be required to implement standard erosion and sedimentation control measures (BMPs), as described in mitigation measures HWQ-1 through HWQ-3, for all grading, filling, clearing of vegetation, or excavating that occurs as part of site and haul road construction.
There would be loss of native vegetation.	VEG-1 to VEG-3, VEG-5, VEG-6, BIO-10	LTS	**BIO-7**: The Construction Contractor will be required to minimize dust impacts to vegetation, wetlands, and breeding wildlife. Unpaved access roads would be frequently watered with raw water using a sprayer truck during periods when trucks and other construction vehicles are using the roads, except during periods when precipitation has dampened the soil enough to inhibit dust. The speed limit on unpaved roads in the construction footprint would be limited to avoid visible dust.
There would be permanent loss of wetlands and other waters of the U.S.	VEG-4, VEG-6, VEG-7, BIO-10	LTS	**BIO-9:** The responsible Federal Agency or their respective Construction Contractor will employ qualified biologists (monitors) throughout the construction period to identify any at-risk special-status species. The biologist will consult with the appropriate agency to remove individuals from the project area, according to USFWS and CDFG laws, handling guidelines, licenses, and permits.
There would be temporary disturbance of wetlands and other waters of the U.S.	VEG-4, VEG-6, VEG-7, BIO-10	LTS	**BIO-10:** Reclamation will follow recommendations in the FWCAR and complete mitigation in the FWCAR for all affected habitats. Following the Corps' incremental analysis, the Corps will develop and coordinate project-related mitigation with USFWS, and ensure mitigation will be implemented for all affected habitats.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]	*List of Mitigation Measures for each Resource*[4]
Construction activities and borrow site excavation may result in adverse effects to host plants for the valley elderberry longhorn beetle.	BIO-11, INV-1a, INV-1b, INV-1c, INV-1d, INV-1e	LTS	**BIO-11:** To minimize adverse effects to federally listed species and their habitats, the responsible Federal agency shall implement avoidance and minimization measures from the project Biological Assessment and anticipated in the Biological Opinion from the USFWS. These measures will supplement and supercede, if necessary, other project mitigation measures.
			WIL-1: To the extent possible, the responsible Federal Agency will direct their respective Construction Contractor to initiate excavation and construction activities during non-breeding seasons for special-status and protected wildlife. Habitat for special status and protected species will be removed during the non-breeding season if practicable to preclude return to the project area by the species during construction activities.
			BRD-1: To the extent possible, the responsible Federal Agency will direct their respective Construction Contractor to remove vegetation and potential bird breeding habitat in the Folsom DS/FDR project area between September 1 and February 28, when birds are not expected to be nesting within the project area, in order to comply with the Migratory Bird Treaty Act (MBTA) and EO 13186. Impacts to non-breeding birds still may occur between September 1 and February 28, because they are not reproductively constricted to the project area during that period. During the period from March 1 to August 31, bird reproduction is occurring and therefore the potential for impacts to nesting birds exists.

Table 2-2 *Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures*				
Impact Being Mitigated	***Relevant Mitigation Measures***	***Level of Significance With Mitigation[3]***		***List of Mitigation Measures for each Resource[4]***
				BRD-2: The responsible Federal Agency will be required to develop and implement a bird monitoring plan as part of the MMRP to monitor and mitigate construction-related impacts to birds during the breeding season, in compliance with the MBTA and Executive Order 13186. Mitigation will include but is not limited to a nest monitoring zone of an adequate size to avoid or significantly reduce impacts to breeding birds at active construction sites. Also, methods to either deter nesting or acclimate birds to construction noise and activities will be employed. One potential method would be the use of acoustic recordings within 500 ft of blasting sites to deter birds from nesting near blasting areas or allow them to become habituated to the noise. Also, an appropriate buffer zone around active nests of special status bird species will be implemented. Nest monitoring will be conducted by a biologist qualified and experienced in such methods.
				AMP-1: The Construction Contractor will be required to grade and drain excavated areas within the proposed borrow sites to prevent attraction to the artificial pools by amphibian species as well as prevent fish stranding with changing reservoir water surface elevations.
				VEG-1: Reclamation will be required to compensate for native oaks and oak woodlands impacted by construction at the ratio stipulated in the FWCAR and MMRP. Following the Corps' incremental analysis, the Corps will develop and coordinate project-related mitigation with USFWS, and ensure mitigation will be implemented for all affected habitats.
				VEG-2: Reclamation will be required to compensate for riparian vegetation impacted by construction at the ratio stipulated in the FWCAR and MMRP. Following the Corps' incremental analysis, the Corps will develop and coordinate project-related mitigation with USFWS, and ensure mitigation will be implemented for all affected habitats.
				VEG-3: Reclamation will be required to compensate for chaparral vegetation impacted by construction at the ratio stipulated in the FWCAR and MMRP. Following the Corps' incremental analysis, the Corps will develop and coordinate project-related mitigation with USFWS, and ensure mitigation will be implemented for all affected habitats.

Table 2-2 *Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures*				
Impact Being Mitigated	***Relevant Mitigation Measures***	***Level of Significance With Mitigation[3]***		***List of Mitigation Measures for each Resource[4]***
				VEG-4: Reclamation will be required to compensate for wetlands impacted by construction at the ratio stipulated in the FWCAR and MMRP. Following the Corps' incremental analysis, the Corps will develop and coordinate project-related mitigation with USFWS, and ensure mitigation will be implemented for all affected habitats.
				VEG-5: For appropriate phases of work, prior to bringing in equipment from other sites, Construction Contractors will clean all mud, soil, and plant/animal material from the equipment. This will help prevent the importation of plants or animals that are exotic, non-native, or invasive.
				VEG-6: The responsible Federal Agency will ensure that all revegetated or disturbed areas will be monitored for invasive non-native plant species, particularly French broom and pampas grass, for three to five years following completion of construction, with the assistance of a qualified botanist. If invasive species are becoming established on areas disturbed by project activities during the three to five year period, invasive species will be removed at times that preclude the plants from setting new seed.
				VEG-7: During jet grouting of the foundation at MIAD, Reclamation will be responsible to delineate wetlands downstream of MIAD using flagging. No equipment will be staged within 25 ft of a wetland, nor will work take place within 25 ft of a wetland.
				INV-1a: Where avoidance is compatible with the construction of the Folsom DS/FDR Action, the responsible Federal Agency working with their respective construction contractor will establish and maintain a 100-foot buffer zone round all elderberry plants containing stems measuring 1.0 inches or greater in diameter at ground level. USFWS will be consulted before any disturbances within the buffer area occur.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]		*List of Mitigation Measures for each Resource*[4]
				INV-1b: The responsible Federal Agency will transplant each elderberry plant that cannot be avoided during Folsom DS/FDR construction to a conservation area approved by USFWS. All elderberry plants containing stems measuring 1.0 inches or greater in diameter at ground level will be transplanted to a conservation area if technically feasible, per project Biological Assessment that was submitted to USFWS and Biological Opinion that is anticipated from USFWS as well as the Valley Elderberry Longhorn Beetle (VELB) conservation guidelines (USFWS 1999).
				INV-1c: The responsible Federal Agency will compensate for each elderberry stem measuring 1.0 inch or greater in diameter at ground level that is adversely affected during Folsom DS/FDR construction with elderberry seedlings and associated native plant seedlings in the conservation area, per the Biological Opinion for the Project and USFWS's 1999 VELB Conservation Guidelines. A minimum survival rate of at least 60 percent of the elderberry plants will be maintained throughout the monitoring period (see INV-1e). If survival drops below this level, additional seedlings or cuttings will be planted. Stock for plantings will be obtained from local sources.
				INV-1d: The responsible Federal Agency will be responsible for planting native plants associated with elderberry plants at the Folsom DS/FDR Action site, or at similar reference sites, at ratios provided in the Biological Opinion for the Project. A minimum survival rate of at least 60 percent of the associated native plants must be maintained throughout the monitoring period (see INV-1e). If survival drops below this level, additional seedlings or cuttings will be planted. Only stock from local sources will be used.
				INV-1e: The responsible Federal Agency will establish a conservation area distinct from the project area that will be protected in perpetuity as a compensation site for transplanted elderberry plants and associated native vegetation. This area will provide at least 1,800 square feet for each transplanted elderberry plant. The condition of the valley elderberry longhorn beetle, elderberry shrubs, and general condition of the conservation area will be monitored over a period of ten consecutive years or for seven years over a 15-year period occurring on the first, second, third, fourth, fifth, seventh, tenth, and fifteenth years.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]	*List of Mitigation Measures for each Resource*[4]
Aquatic Biota			
Construction activities may result in alteration of habitat for protected vernal pool invertebrates or direct impacts to these species.	BIO-4, BIO-11, AQINV-1a, AQINV-1b, AQINV-1d	LTS	**AQINV-1a**: The responsible Federal Agency will complete protocol surveys for special-status branchiopods prior to any grading or other construction activities in potential habitat for these species.
Jet grouting may have direct or indirect impacts to adjacent wetland ecosystems	AQINV-4	LTS	**AQINV-1b**: The responsible Federal Agency working with their respective Construction Contractor will avoid (preserve) potential vernal pool habitat by placing fencing and a suitable buffer area around the vernal pool area to prevent effects from vehicle compaction and other construction-related activities. For vernal pool habitat that is to be avoided, an approved biologist (monitor) will inspect construction-related activities to ensure that no unnecessary take or destruction of habitat occurs. The biologist will contact the construction representative who has the authority to stop activities that may result in such take or destruction until corrective measures have been taken. The biologist will also be required to report immediately any unauthorized effects to Reclamation or the Corps, and to the USFWS and CDFG.
Dewatering the existing Stilling Basin would displace and potentially harm fish.	FISH-1	LTS	**AQINV-1d:** Adverse impacts to potential vernal pool habitat in the Folsom DS/FDR footprint will be compensated in a manner agreed upon by the responsible Federal Agency and the USFWS. For example, for habitat that is directly or indirectly affected, vernal pool credits will be dedicated within a USFWS-approved ecosystem preservation bank. Based on a USFWS evaluation of conservation values of the affected habitat, vernal pool habitat will be preserved, or created and monitored, on the Folsom DS/FDR site, or on another non-bank site approved by the USFWS. Vernal pool habitat and associated upland habitat used as on-site mitigation will be protected from adverse effects and managed in perpetuity or until the responsible Federal Agency and USFWS agree on a process to exchange such areas for credits within a USFWS-approved mitigation banking system.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]		*List of Mitigation Measures for each Resource*[4]
				AQINV-4: To monitor the health of the wetlands downstream of the construction at MIAD, Reclamation will conduct bioassessment studies prior to, during, and after jet grouting of the MIAD foundation.
				FISH-1: The responsible Federal Agency will develop a fish removal plan prior to dewatering the existing Stilling Basin and implement the plan at the time of dewatering.
Soils, Minerals, and Geological Resources				
Construction activities near D1/D2, MIAD, and Dike 8 could result in effects associated with asbestos disturbance.	GR-1	LTS		**GR-1**: In order to obtain air quality permits from both Sacramento and El Dorado Counties, the responsible Federal Agency will prepare a geologic site characterization report (signed by a California Registered Geologist) and a county approved Dust Mitigation Plan. The geologic site characterization report will be useful for mitigation purposes by identifying areas of naturally-occurring asbestos. The Dust Mitigation Plan will specify the activities and Best Management Practices (BMPs) required to minimize airborne naturally-occurring asbestos. These activities and BMPs are specified in the Airborne Toxic Control Measure regulation as well as the more restrictive county requirements. These include, but are not limited to, the following: • Pre-wet work area and keep area sufficiently wet during construction operations. An approved palliative material may also be used to seal loose fibers to the parent material; • Limit vehicle access and speed on serpentine and other materials containing asbestos; • Cover areas that are exposed to vehicle travel; • Material transfers and stockpiles of loose material must be covered, kept adequately wet, or sealed by an approved palliative; and,

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[3]		*List of Mitigation Measures for each Resource*[4]
				• Worker safety precautions and monitoring should be considered. Written employee notifications should be provided, notifying employees of the potential health risk and requirements of the asbestos dust mitigation plan (El Dorado County 2003).
Construction activities would increase the potential for soil erosion.	GR-2	LTS		**GR-2:** Prior to construction activity, the responsible Federal Agency along with their Construction Contractor will file a Notice of Intent with the CVRWQCB to indicate the intent to comply with the State General Permit for Storm Water Discharges Associated with Construction Activity (General Permit). The General Permit establishes conditions to minimize sediment and pollutant loading and requires preparation and implementation of a SWPPP prior to construction. (See Section 3.1 for more details). The purpose of this Plan is to prevent the movement of construction pollutants (in contact with storm water) into receiving water. This is accomplished through the selection of BMPs which are measures that are applied to control erosion and sediment transport. The SWPPP lists the BMPs that will be used and identifies the placement of the BMPs (State Water Resources Control Board 2006). BMPs will be used during the construction period to stabilize the soil in affected areas (e.g., Auxiliary Spillway and borrow and fill sites) until vegetation will be reestablished as well.
Visual Resources				
Construction would introduce color and form changes to the landscape				Note: visual resource impacts during construction are not mitigatable. The restoration of disturbed areas following construction will reduce any form or color impacts due to construction.
Construction of the parapet wall would introduce a color change to the top of existing dikes and dams.	VIS -3	LTS		**VIS-3***:* To lessen the visual impacts of the concrete parapet walls, a coloring agent will be added to the concrete to help it blend In with the natural surroundings.
Agricultural Resources				
N/A				Note: there are no agricultural resources within the footprint of the Folsom DS/FDR actions.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Impact Being Mitigated	*Relevant Mitigation Measures*	*Level of Significance With Mitigation*[5]	*List of Mitigation Measures for each Resource*[6]
Transportation and Traffic			
Project alternative would result in traffic impacts including LOS deterioration, an ADT Increase >2%, and LOS F V/C Increase >0.05.	T-1, T-2, T-3	LTS	**T-1:** In conjunction with the development and review of more detailed project design and construction specifications, the responsible Federal Agency, including CCAO and CCAO area manager, will prepare a peak hour capacity analysis on specific intersections to evaluate the need for changes to traffic signal timing, phasing modification, provision of additional turn lanes through re-striping or physical improvements, as necessary and appropriate to reduce project-related impacts to an acceptable level. In conjunction with that assessment, the potential need for roadway improvements or operation modifications (i.e., temporary restrictions on turning movements, on-street parking, etc.) to enhance roadway capacity in light of additional traffic from the project will be evaluated. The completion of these evaluations and the identification of specific traffic improvement measures, as deemed necessary and appropriate in light of the temporary nature of impacts, will be coordinated with the transportation departments of the affected jurisdictions.
			T-2: The responsible Federal Agency, including CCAO and CCAO area manager, working with their respective Construction Contractor will prepare a transportation management plan, outlining proposed routes to be approved by the appropriate local entity, and implement it. High collision intersections will be identified and avoided if possible. Drivers will be informed and trained on the various types of haul routes, and areas that are more sensitive (e.g., high level of residential or education centers, or narrow roadways). To the extent practicable, deliveries will be restricted to non-commute hours.
			T-3: The responsible Federal Agency, including CCAO and CCAO area manager, working with their respective Construction Contractor will develop and utilize appropriate signage to inform the general public of the haul routes and route

[5] LTS = Less than significant with mitigation.
[6] Unless otherwise specified, for mitigation measures that refer to "responsible Federal agency", the Corps is responsible for impacts and corresponding mitigation related to flood damage reduction construction activities; for all other construction-related project impacts and corresponding mitigation, Reclamation is the responsible Federal agency.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

			changes, if applicable.
Noise			
The following measures will be incorporated into a Noise Control Plan to address increased night time noise levels as a result of the Folsom DS/FDR activities.	N1, N2, N3, N4, N5, N6, N7, N8, N9, N10	LTS	**N-1:** The responsible Federal Agency will incorporate the appropriate level of sound attenuation on equipment or near facilities that will attenuate sound at sensitive receptors to comply with local noise ordinances. Potential sound attenuation measures that could be considered include, but are not limited to, temporary sound barriers near the noise source, such as those considered in the impacts analysis relative to BACT for stationary/quasi-stationary equipment, or otherwise placed between the source(s) of construction noise and noise-sensitive receptors, as appropriate.
			N-2: The Construction Contractor will be responsible for maintaining equipment to comply with noise standards (e.g., exhaust mufflers, acoustically attenuating shields, shrouds, or enclosures).
			N-3: If necessary to meet local noise ordinances, the Construction Contractor will be required to enclose above-ground conveyor systems in acoustically-treated enclosures.
			N-4: If necessary to meet local noise ordinances, the Construction Contractor will be required to line or cover hoppers, conveyor transfer points, storage bins and chutes with sound-deadening material.
			N-5: When necessary to comply with nighttime noise levels, the Construction Contractor will be required to schedule truck loading, unloading, and hauling operations so as to reduce nighttime noise impacts to less than noticeable levels.
			N-6: For nighttime or after-hour construction, the Construction Contractor will obtain a permit from the City and County, as appropriate.
			N-7: The responsible Federal Agency will schedule blasting to daylight hours only and will adhere to restrictions on blasting as stated per Reclamation and Corps' safety regulations.
			N-8: Monitoring blasting vibration will be implemented as per Reclamation and Corps safety guidelines.
			N-9: The Construction Contractor will be directed to use as appropriate blasting mats to cover blasts in order to minimize the possibility of fly rock.

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

				N-10: The responsible Federal Agency along with their respective Construction Contractor will examine any properties, structures and conditions where complaints of damages have been filed will be performed within three weeks of rock excavation and blasting work.
Cultural Resources				
Construction would lead to adverse effects to historic properties and/or historical resources.	CR-1	LTS		**CR-1:** Identification, Evaluation and Mitigation (Treatment) of Impacts to Historic Properties and/or Historical Resources. All cultural resources located within the Area of Potential Effect (APE) will be evaluated for inclusion in the National Registry of Historic Places (NRHP) and the CRHR using criteria found at 36 CFR Part 800.4 or CRHR Guidelines. A memorandum of agreement or a programmatic agreement will be developed, in consultation with SHPO and consulting parties, to mitigate impacts to any identified historic properties or historic resources. The implementation of the agreement document will reduce impacts to historic properties or historic resources to less than significant levels, per NEPA and CEQA. Cultural resources that are determined to be not eligible for inclusion in the NRHP or the CRHR require no further management. It should be noted that some cultural resources may not meet NRHP eligibility criteria, but still may be CRHR eligible and could be managed per CEQA but not per NEPA. If human remains are discovered, procedures outlined in Reclamation's Directive and Standards for the Inadvertent Discovery of Human Remains (LND 07-01) will be followed. The standard contract specifications contain directions to follow in the unlikely event of the discovery of other cultural resources during the construction phase of this project. Any such discovery will also be considered under the provisions of 36 CFR Part 800.13.
Construction would lead to adverse effects to previously unknown historic properties and/or historical resources.	CR-1	LTS		

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

Construction would lead to adverse effects upon previously undiscovered and potential historic properties and/or historical resources within the area of the increased reservoir elevation, and locations of new embankment, or footprints of construction work at existing Folsom Facilities.	CR-1	LTS	
Land Use			
N/A			There will be no changes to land use under the Preferred Alternative for the Folsom DS/FDR actions.
Recreation			
Construction could result in occasional temporary loss of recreational use at Folsom Point.	RC-1 through RC-8	LTS	**RC-1:** All construction-related damages to recreation facilities will be replaced in kind by the appropriate Federal Agency, in accordance with their respective policies and guidance.
Construction traffic could result in periodic interruptions to recreation at Beal's Point.	RC-1 through RC-8	LTS	**RC-2:** The responsible Federal Agency will post signage and public announcements to inform the public of construction activities, facility closures at Folsom Point or Beal's Point, and provide instructions as to where alternative access to FLSRA will be possible. The selected alternative is to construct a grade separation at Folsom Point. Traffic will be separated either through a tunnel that creates a grade separation or via a controlled, secured intersection with a flag person or other engineered mechanism. In any case, the public will have continuous access to Folsom Point during the construction period. The public access entrances at Beal's Point will be reconstructed to allow concurrent construction traffic and public access. This will significantly reduce the impacts on the recreation facilities.
Construction could result in lost recreational use on trails at Beal's Point.	RC-9, RC-10	LTS	
Construction could result in cancellation of special events scheduled at FLSRA.	RC-7	LTS	
Installation and operation of security measures could interrupt recreation at FLSRA facilities.	RC-6, RC-9, RC-10	LTS	
Construction could result in lost recreation on the Folsom Point-Browns Ravine Trail.		Temporary, Significant and Unavoidable	
			RC-3: Construction, borrow and staging areas will be sited as far away from recreation areas as practical in order to minimize recreation impacts, as determined by the responsible Federal Agency. When a staging area cannot be moved or relocated, appropriate measures would be taken for noise and safety considerations.

Table 2-2 *Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures*	
	RC-4: The responsible Federal Agency will ensure that sites used for borrow development, staging and construction activities will be re-contoured by the lead constructing agency, as appropriate, to pre-construction conditions, or to contours which do not pose a safety hazard.
	RC-5: After all construction activities are complete at Beal's Point, Folsom Point, or Granite Bay, the responsible Federal Agency will ensure that all disturbed recreation areas and facilities will be restored as closely as possible to pre-construction conditions.
	RC-6: The responsible Federal Agency will include in the plans and specifications, as appropriate, details necessary to ensure that the entrance stations at Folsom Point and Beal's Point will meet public safety and traffic requirements during construction.
	RC-7: The Responsible Federal Agencies including CCAO and the CCAO Area Manager will ensure that construction activities will be scheduled to minimize impacts during peak recreation use periods, holidays, and special events so as to allow public access to the extent practical.
	RC-8: The Responsible Federal Agencies including CCAO and the CCAO area manager will develop a traffic management plan for all public roads and trails within the recreation areas where both public and construction traffic occur. The plan would include measures such as flagmen and appropriate signage. The traffic plan would be submitted to the appropriate entities, or included in the Plans and Specifications for construction. An appropriate mile per hour speed limit would be imposed in all public areas close to construction. Construction crews and traffic will utilize internal haul routes, to the extent practical.
	RC-9: The responsible Federal Agency working with California Department of Parks and Recreation (DPR) will identify suitable detours, with appropriate signage, for any bike, equestrian, or pedestrian trails that are interrupted by construction, per agency guidance and policy. Public service announcements would also be distributed and posted to inform the public of route changes. Where possible to ensure public safety, the recreational trails affected by the truck traffic will be relocated to allow the trails to stay open during construction.

Table 2-2
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				RC-10: Any damage to existing improved trails from construction will be repaired in kind after construction is completed by the responsible Federal Agency, per agency policy and guidance.
Public Utilities				
Construction activities could require the relocation of electricity infrastructure.	PSU-1	LTS		**PSU-1:** The responsible Federal Agency, including CCAO and CCAO area manager, working with their respective Construction Contractor will coordinate with utility companies and other relevant agencies before construction to locate existing utilities and avoid damage. Avoid the relocation of utilities whenever possible. Provide notification of any potential interruptions in services to the appropriate agencies.
Electricity would be required to power processing and concrete batch plants.	PSU-2	LTS		**PSU-2**: The responsible Federal Agency, including CCAO and CCAO area manager, working with their respective Construction Contractor and local power utility will stage utility relocations to minimize interruptions in service.
Construction activities could require the relocation of existing water and wastewater infrastructure.	PSU-1	LTS		**PSU-3**: The Construction Contractor will be instructed to consult with local landfills to select licensed landfills with adequate capacity to receive the wastes.
Construction activities would generate solid waste.	PSU-3, PSU-4, PSU-5	LTS		**PSU-4:** The Construction Contractor will be instructed to recycle construction wastes whenever possible.
Construction activities could increase emergency response times to the Folsom Facility.	PSU-6	LTS		**PSU-5:** The Construction Contractor will be directed to dispose of hazardous wastes at licensed hazardous waste facilities.
Construction activities could require the relocation of telecommunication infrastructure.	PSU-1, PSU-2	LTS		**PSU-6:** Prior to construction, the responsible Federal Agency in conjunction with its respective Construction Contractor will consult with local police, fire, CCAO and CCAO area manager, and DPR staff to develop and implement emergency response plans and establish emergency vehicle routes.
Hydropower				
N/A				The Folsom DS/FDR actions will not change current power operations.
Population & Housing				
N/A				The Folsom DS/FDR actions will not require new housing construction.
Environmental Justice				

Table 2-2 *Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures*				
N/A				The Folsom DS/FDR actions will have no significant environmental justice impacts.
Public Health & Safety				
Construction activities could increase hazards by the placement of construction equipment in waterways, roadways, or other areas potentially accessible by park visitors.	PHS-1	LTS		**PHS-1:** A public safety management plan will be prepared by the responsible Federal Agency and implemented to maintain public safety during all phases of construction. Components of the plan will address: • Public notification of the location and duration of construction activities, pedestrian/bicycle path/trail closures, and restrictions on reservoir use (i.e., boating, water skiing, fishing, swimming); • Verification with local jurisdictions that construction blockage of existing roadways will not interfere with existing emergency evacuation plans; • Adequate signage regarding the location of construction sites and warning of the presence of construction equipment; • Fencing of construction staging areas and of construction areas if dangerous conditions exist when construction is not occurring; and • Temporary walkways (with appropriate markings, barriers, and signs to safely separate pedestrians from vehicular traffic) and detour signage where an existing sidewalk or pedestrian/bicycle path/trail will be closed during construction.
Construction would increase the risk of fire.	PHS-2	LTS		**PHS-2:** Prior to initiating construction activities, the responsible Federal Agency in consultation with CCAO and CCAO area manager and the appropriate city, county and State fire suppression agencies will prepare and implement a Fire Management Plan. The plan will include fire prevention and response methods including fire precaution, pre-suppression, and suppression measures consistent with the policies and standards in the affected jurisdictions.
Construction work at sites used to construct the original Folsom Facility may expose workers to health and safety effects from chemical materials buried at those sites.	PHS-3, PHS-4, PHS-5	LTS		**PHS-3:** The responsible Federal Agency will conduct a Phase I Environmental Site Assessment (ENSA) at all former construction sites before beginning construction. As necessary, a soil characterization program will be developed and implemented at all excavation locations in proximity to listed hazardous waste sites identified in the Phase I ENSA. The soil characterization program will identify those excavation areas that will require development and implementation of appropriate remediation measures. Mitigation Measure PHS-5 described below applies only to areas where contact with contaminated soil or groundwater is suspected.
Construction work could expose workers	PHS-4,	LTS		**PHS-4:** The Responsible Federal Agencies will prepare and implement a Worker

Table 2-2
Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures

to hazardous materials used during construction	PHS-5			Health and Safety Plan prior to the start of construction activities. The Contractor will prepare a Health and Safety Plan that should, at a minimum, identify: • all contaminants that could be encountered during excavation activities (e.g., potential for asbestos, TPH in soil) ; • all appropriate worker, public health, and environmental protection equipment and procedures; • emergency response procedures; • most direct route to a hospital; and • Site Safety Officer. The plan will require documentation that all workers have reviewed and signed the plan.
				PHS-5: Prior to initiation of construction activities, the Construction Contractor will be required to prepare a Hazardous Material Management Plan for review by the responsible Federal Agency. The purpose of this plan is to have an established plan of action if hazardous materials are encountered during construction and to establish best management practices (BMPs) to reduce the potential for exposure to hazardous wastes. The plan will: • define a protocol for proper handling and disposal of hazardous materials if they are encountered during construction, • define a protocol for proper emergency procedures and handling and disposal of hazardous materials if an accidental spill occurs during construction, and • establish BMPs to reduce the potential for spills of HTRW. Typical BMPs to reduce the potential for spills may include, but are not limited to: • having a spill prevention and control plan with a designated supervisor to oversee and enforce proper spill prevention measures; • providing spill response and prevention education for employees and subcontractors; • stocking appropriate clean-up materials onsite near material storage, unloading and use areas; • designating hazardous waste storage areas away from storm drains or watercourses; • minimizing production or generation of hazardous materials onsite or substituting chemicals used onsite with less hazardous chemicals; • designating areas for construction vehicle and equipment maintenance and fueling with appropriate control measures for run-on and runoff; and • arranging for regular hazardous waste removal to minimize onsite storage.

Table 2-2 *Folsom Dam Safety/Flood Damage Reduction EIS/EIR Impacts and Mitigation Measures*				
Indian Trust Assets				
There are no Indian Trust Assets within the Folsom DS/FDR project footprint.				