

2 Project Description

2.1 Introduction

This chapter presents a description of the B.F. Sisk Dam Safety of Dams Modification Project currently proposed for implementation by the California Department of Water Resources (DWR) and Bureau of Reclamation (Reclamation), with an emphasis on defining the proposed changes to the Approved Project since certification of the B.F. Sisk Dam Safety of Dams Modification Project Environmental Impact Statement/Environmental Impact Report (2019 EIS/EIR).¹ The impacts of proposed changes included under the Modified Project are the subject of the environmental impact analysis presented in Chapter 3. The intent is to provide sufficient detail on the Modified Project for the reader to understand the whole of the action that would be undertaken and to appropriately frame the proposed project modifications subject to this supplemental environmental impact report (SEIR).

Because the 2019 EIS/EIR was a joint National Environmental Policy Act/California Environmental Quality Act (CEQA) document, it included project-level analysis of three alternatives—the No Action/No Project Alternative, the Reservoir Restriction Alternative, and the Crest Raise Alternative. Those alternatives are described in Section 2.2 of the 2019 EIS/EIR. As discussed in Section 1.1.2 of this SEIR, Reclamation and DWR are proceeding with the Crest Raise Alternative, because the 2019 EIS/EIR determined that it was the only alternative identified with the ability to achieve all project objectives while balancing adverse environmental effects. The modifications to the project being considered and evaluated by this SEIR are therefore modifications specific to the Crest Raise Alternative. There are no changed circumstances or other significant new information pursuant to Section 15162 of the State of California CEQA Guidelines that affect the No Action/No Project Alternative or the Reservoir Restriction Alternative to consider in this SEIR. As a result, the project description included in this chapter of the SEIR focuses solely on changes relative to the Crest Raise Alternative.

2.2 Existing B.F. Sisk Dam Features and Stability Concerns

B.F. Sisk Dam, constructed between 1963 and 1967, is a zoned compacted earth-fill embankment structure that impounds over 2 million acre-feet of water in San Luis Reservoir. B.F. Sisk Dam was constructed by and is under the ownership of Reclamation, though the facility is operated by DWR. The dam is split into sections for locational reference, as depicted in Figure 2-1. B.F. Sisk Dam sections run from north to south and include the left abutment; the valley section, which includes the north valley section (NVS) and the south valley section (SVS); and the right abutment. The abutments are primarily founded on bedrock (sandstone, shale, and conglomerate), which is covered by clayey slopewash² in some locations. The NVS and SVS are the alluvial channels of San Luis Creek and Cottonwood Creek impounded by B.F. Sisk Dam and consist of deposits of sands and gravels with clayey or silty fines.

The dam embankment consists of multiple zones, including a rolled earth section of clay, sand, and gravel; a 3-foot-thick layer of rock riprap protecting the upstream face; and a 2-foot-thick rockfill section on the downstream face, as shown in Figure 2-2, Existing Dam Cross-Section.

¹ The project addressed in the 2019 EIS/EIR is referred to in this SEIR as the Approved Project; the Approved Project plus proposed modifications identified since certification of the 2019 EIS/EIR is referred to as the Modified Project.

² Slopewash consists of particles of rock and soil washed downslope by precipitation in the process of sheet erosion and is much weaker than the underlying bedrock material.

The dam has a maximum structural height of 382 feet, a crest width of 30 feet, and a crest length of 18,600 feet at elevation 554 feet. A 200-foot-long, 25-foot-high saddle dike is present along the north rim of the reservoir, separated from the main dam by approximately 1,300 feet. San Luis Reservoir provides 2,027,840 acre-feet of water storage.

B.F. Sisk Dam features a spillway conduit with intake/outlet works leading to a vertical conduit that transitions to a horizontal tunnel pipe for outlet to the open chute leading to O'Neill Forebay. Downstream of the central section of the dam and just south of O'Neill Forebay is a complex of offices, which include Reclamation, DWR, and the California Department of Parks and Recreation (CDPR) office facilities. DWR operates the Romero Visitor's Center, located just northwest of B.F. Sisk Dam's left abutment, along State Route (SR) 152.

The dam is in an area with potential for severe seismic activity from known faults, primarily the Ortigalita Fault, which crosses the reservoir. Studies of the seismic safety of B.F. Sisk Dam completed by Reclamation and DWR beginning in the 1980s determined that less-dense soils under the dam and in the dam abutments could undergo liquefaction during a seismic event and result in significant deformation (i.e., crest settlement) of the dam in the sections built on the alluvium and clayey slopewash, particularly at the NVS and SVS (Reclamation 2013). Seismic analysis and modeling carried out on the dam determined that the predicted settlement of the dam crest as a result of a severe seismic event could result in the dam crest height settling below the surface level of the reservoir, which would allow water to overtop and erode the dam embankment. Settling of the dam embankment also has the potential to result in cracks in the dam embankment that could result in leaks and erosion of the embankment material. Reclamation and DWR completed a probabilistic risk analysis to determine the likelihood of events that could lead to dam failure. The probabilistic risk analysis determined that failure of the dam is very unlikely, but that consequences of a dam failure would be severe and therefore do not meet Reclamation's Public Protection Guidelines (Reclamation 2011) and warrant corrective action. Corrective actions studies were carried out by Reclamation with participation by DWR (Reclamation 2019).

The corrective actions studies indicated that deformation potential would be addressed by removing the alluvium and clayey slopewash, constructing downstream stability berms keyed into the underlying bedrock, and raising the dam crest 12 feet to increase the reservoir's freeboard, or the distance between the water surface and the dam crest (Reclamation 2013). Raising the dam would be accomplished by placing additional material on the downstream face of the embankment, which would also serve to strengthen the embankment; no additional water storage would be provided by the increase in dam height. These measures to alleviate risk associated with a seismic event would be implemented as part of the Approved Project evaluated in the 2019 EIS/EIR.

2.3 Description of the Approved Project

The following section provides a description of the Approved Project as it was presented in Section 2.2.3 of the 2019 EIS/EIR. In summary, the Approved Project—referred to as the Crest Raise Alternative in the 2019 EIS/EIR— involves making improvements to the downstream side of the existing dam to enhance its stability, and increasing the dam crest height to reduce the potential that water would overtop the dam if seismic-induced slumping were to occur. These improvements would be accomplished by (1) constructing stability berms and downstream crack filters in select areas, (2) adding additional material over the entire area of the existing embankment, (3) installing a new filter around the existing spillway conduit, and (4) extending the spillway conduit to meet the resultant downstream edge of the extended embankment. Construction of three foundation shear keys to anchor the proposed stability berms to underlying bedrock is also part of the Crest Raise Alternative. One of the three locations for a proposed shear key is described as optional but was analyzed by the 2019 EIS/EIR as if part of the Approved Project. Features

of the Approved Project are shown in Figure 2-3, Approved and Modified Project Footprints.³ Details of individual Approved Project features and aspects of Approved Project construction are provided below.

2.3.1 Project Features

This section describes the features of the Approved Project, as identified in the 2019 EIS/EIR. The approach to constructing these features, as described in the 2019 EIS/EIR, is summarized in Section 2.3.2, Project Construction. Please note that the description provided below is based on the level of design available at the time the 2019 EIS/EIR was prepared and that minor modifications have been made to refine the Approved Project design to respond to further investigations of site-specific conditions and constraints. Minor changes to the Approved Project are noted below; more substantial changes to the Approved Project made subsequent to the 2019 EIS/EIR, and which are the subject of this SEIR, are described in Section 2.4, Proposed Project Modifications and Clarifications. The latest set of project plans is provided in Appendix A.

2.3.1.1 Stability Berms and Foundation Shear Keys

The Approved Project would address the dam's crest-settlement potential by removing the weak alluvium and clayey slopewash located beneath parts of the dam and extending the excavations into firm, unweathered bedrock foundation material comprised of the underlying Panoche formation. These excavations would be extended beyond the toe of the existing dam berm to provide a firm foundation for additional material that would be added to construct stability berms on the downstream side of the existing dam as part of the Approved Project. The problematic weak material excavated from under the dam and abutments would be replaced with material less susceptible to liquefaction and consistent with materials in the existing dam berm. The existing rock blanket on the downstream face of the dam would be stripped and stockpiled for reuse and material would be added to the existing berm to strengthen the dam and to ensure more uniform crest settlement, reduce deformation, and minimize internal movement, cracking, and erosion in the event of a severe seismic event.

The stability berms included in the Approved Project are designed and would be constructed based on the results of deformation and risk analyses conducted by Reclamation. The design and materials for stability berms would be specific to the location of the berm along the existing dam embankment. In general, the stability berms would be constructed of layers of compacted boulders, cobbles, gravel, sand, and topsoil to provide appropriate strength and drainage characteristics. Foundation shear keys consisting of large rockfill (up to 15 inches in diameter) would be constructed in several locations at the base of the stability berms at the contact with the underlying bedrock. The shear keys would provide additional stability and protection against movement during a seismic event and would be constructed beneath stability berms in slopewash sections of the abutments and the NVS berm. A shear key at the SVS berm was assessed as an optional feature in the 2019 EIS/EIR; however, due to significant depth to bedrock, a shear key at the SVS berm will not be constructed. Longitudinal drains, filter chimneys, and toe drains would be installed in the stability berms to provide internal drainage and protect against soil migration and erosion of the embankment.

Reinforcement of the dam under the Approved Project as described above would occur by expanding the embankment and constructing downstream stability berms over the length of the dam within the left abutment, NVS, SVS, and right abutment. A typical cross-section of the dam embankment is shown in Figure 2-2. The largest area of proposed reinforcement would be within the SVS. It is anticipated that modifications to the dam

³ The 2019 EIS/EIR considered and addressed the work that would be required in the East Dike area of the dam; however, this area was omitted from exhibits and figures within the 2019 EIS/EIR. To correct for this inadvertent mapping omission, the East Dike area is identified and mapped as part of the Approved Project footprint and is not evaluated as a proposed modification to the Approved Project in this SEIR.

embankment would require up to 5 million cubic yards of earth material, which would be sourced from a borrow area north of SR-152 (Borrow Area 6) and from Basalt Hill Quarry southeast of the dam. Both areas identified for source material are within lands owned by Reclamation.

2.3.1.2 Dam Crest Raise

The Approved Project includes placing earth material over the existing downstream embankment and over the existing crest of B.F. Sisk Dam to increase the crest elevation of the dam by up to 12 feet. Areas where the embankment would be expanded are shown in Figure 2-3. Materials for the expanded embankment would be sourced from Borrow Area 6 and Basalt Hill Quarry. This crest raise would increase the reservoir freeboard to prevent overtopping in the event of seismic-induced dam deformation. This crest raise is intended as a safety measure and would not increase the reservoir's storage capacity. The embankment would be raised to an elevation of 566 feet along the central portion of the dam alignment and would transition back to the existing crest elevation at the left and right abutments. Raising the crest would also involve reconstructing the existing maintenance road over the top of the dam, which would involve applying compacted base material and asphalt paving along the dam crest.

2.3.1.3 Spillway Conduit Filter

The existing B.F. Sisk Dam spillway is located in the dam's left abutment and west of the outlet to O'Neill Forebay. The spillway features a circular intake structure at the dam crest leading to a vertical conduit that then transitions to a horizontal tunnel pipe for outlet to the open chute leading to O'Neill Forebay. The Approved Project includes installing a new filter around the inlet to the existing spillway conduit to O'Neill Forebay. Because the Approved Project would not change the surface elevation of the reservoir, the vertical intake conduit would not be affected by the Approved Project. The Approved Project includes extending the horizontal portion of the spillway conduit to meet the new downstream edge of the expanded embankment in this location.

2.3.2 Project Construction

2.3.2.1 Stability Berms and Foundation Shear Keys

The shear keys and downstream stability berms would be constructed by first excavating the existing liquefiable and soft-foundation soils to bedrock beneath the shear key and berm locations. Excavation would extend to a depth of approximately 55 feet in the NVS alluvium and 50 feet in the abutment sections. Shear key excavations would encounter shallow groundwater and dewatering measures would be employed to maintain a dry work area suitable for excavation with heavy equipment. The downstream rock blanket or slope protection in the affected area of the embankment would also be removed to the top elevation of the embankment and stockpiled downstream of the toe. Next, the existing toe drain of the embankment would be removed by excavation. These two operations would expose the existing blanket drain and surrounding filter materials in the downstream face of the dam. Above the blanket drain, the existing Zone 3 shell would be exposed.

Dewatering for shear key excavations is anticipated to entail installation of temporary deeper wells along with shallower well points that would be installed around each work area requiring dewatering. Water removed from the excavation during this period would be pumped into temporary settling ponds or portable tanks to allow sediment to drop out and meet permit water quality standards before being discharged into the reservoir or forebay. Dewatering will be subject to permitting approval by the Central Valley Regional Water Quality Control Board.

After completing the excavations, the existing filters/drains located at the downstream toe would be re-established and a replacement toe drain seepage collection system would be installed. Sections of the embankment that are not receiving a stability berm would not require further excavation at the downstream toe. Stronger material would be placed as backfill and compacted in the excavated areas and additional embankment material would be added to extend the various zones of the existing embankment to their higher elevations.⁴ Earth materials for this construction are discussed under Construction Material Borrow Areas in the 2019 EIS/EIR.

2.3.2.2 Dam Crest Raise

The dam crest raise component of the Approved Project is referred to as an “overlay raise,” as it is accomplished by overlaying material on top of the existing embankment to achieve the new elevation. This would be performed over the entire length of the dam, including sections receiving stability berms and sections not receiving stability berms. The overlay raise would require excavating approximately 8 feet from the top of the dam and removing the 2-foot-thick rock blanket on the downstream slope of the dam. Removing the top of the dam would expose an approximately 40- to 50-foot-wide surface of the existing low-plasticity clay core (Zone 1) material and provide a working surface for connecting the new zones of the dam overlay to the existing embankment. Raising the crest would also involve reconstructing the existing maintenance road on top of the dam, which would include applying base material, compacting the base material, and paving with asphalt.

2.3.2.3 Construction Material Borrow Areas and Conveyance

Most fill materials for the new enlarged dam embankment, including the stability berms and the crest raise, would be sourced from two on-site borrow areas. These sites, referred to as the Basalt Hill Borrow Area and Borrow Area 6, shown on Figure 2-3, are within Reclamation property. The only fill materials that would be imported to the site are the filter sands that would be used in Zones 6, 9a, and 9b of the stability berms (see Figure 2-2).

Basalt Hill Borrow Area

The Basalt Hill Borrow Area, located approximately 1.5 miles southwest of the dam’s right abutment, was used to provide materials for the original construction of the dam in the 1960s; it would again be used to supply rock materials for the Approved Project, including gravel, riprap, and cobble slope protection. These materials would be produced on site by blasting and crushing source material present at the Basalt Hill Borrow Area. Hauling materials from the Basalt Hill Borrow Area and the downstream construction site would occur on Basalt Road and two haul roads connecting the borrow area to Basalt Road, one for inbound trucks and one for outbound trucks. An additional existing access road providing a shorter haul route from the Basalt Hill Borrow Area to the dam site crosses through San Luis Reservoir’s maximum reservoir water surface elevation and is submerged in the reservoir during much of the year. This road would be used during periods when the reservoir level is low enough to expose the road.⁵

⁴ Additional detail on installing materials in the various embankment zones is provided in Section 2.2.3.2 of the 2019 EIS/EIR.

⁵ Use of this road was not explicitly stated in the 2019 EIS/EIR, but the roadway alignment is largely within the study area defined by the 2019 EIS/EIR. A small portion of the work area planned for operation of this road, just west of the dam’s right abutment, extends beyond the 2019 EIS/EIR study area and has been added as an additional impact area considered in this SEIR.

Borrow Area 6

Borrow Area 6 is located east of B.F. Sisk Dam, north of SR-152, and immediately south of O'Neill Forebay. This borrow area is anticipated to supply material suitable for expanding the dam's Zone 1 core and for materials that would be used in downstream berms.

Hauling materials from Borrow Area 6 would require crossing SR-152 to access the dam site. The 2019 EIS/EIR indicates that the preferred method of transporting materials to the dam site from north of SR-152 would be by crossing under the existing bridge that crosses O'Neill Forebay via either a temporary conveyor system or by constructing a roadway to accommodate low-profile haul trucks (see Figure 2-3). As identified in the 2019 EIS/EIR, other potential options for hauling access to the site from north of SR-152 include installing an at-grade, signalized crossing of SR-152 at Basalt Road, and constructing a tunnel under SR-152 at Basalt Road. The tunnel would be constructed from 15-foot-high by 30-foot-wide concrete box culverts to accommodate a conveyor system to transport materials under the highway. Additional options for transporting materials across SR-152 identified in the 2019 EIS/EIR include constructing a temporary bridge over SR-152 at the Basalt Road location, over which a materials conveyor system would be operated, and transporting materials on existing roadways, including Gonzaga Road and the existing Santa Nella Boulevard/SR-33 underpass southeast of Borrow Area 6.

The Approved Project assumed that if the preferred O'Neill Forebay bridge undercrossing were used for transporting materials from Borrow Area 6, a temporary roadbed would be constructed below the bridge by placing clean riprap and rockfill-sized cobbles and boulders in the water between the second bridge column and the south abutment (approximately 60 feet in width) and surfacing with clean gravel (no fine materials). This temporary roadway would be used to allow for transporting materials between Borrow Area 6 and the dam work site without impacting traffic on SR-152. The temporary roadway would be removed and the area would be returned to preconstruction conditions upon Approved Project completion.

2.3.2.4 Staging and Access Roads

Staging areas anticipated in the 2019 EIS/EIR are shown in Figure 2-3. The Approved Project assumed contractor staging and materials stockpiling would occur throughout much of the area downstream of B.F. Sisk Dam, roughly bound by SR-152 on the north, the Reclamation property boundary on the east, and Basalt Road and Basalt Campground on the south. This includes 120 acres north of the Gianelli Pumping-Generating Plant and approximately 1,000 acres south of the plant. Two small areas downstream of the dam's right abutment were excluded from staging, presumably because of the presence of wetlands. As indicated in the 2019 EIS/EIR, available areas around the dam would be used as staging for the full duration of construction and would be returned to preconstruction conditions after completion of the Approved Project.

The footprint of the Approved Project, as shown in Figure 2-3 and defined by the 2019 EIS/EIR, includes Basalt Campground as a contractor staging area. Basalt Campground would be closed to the public for the duration of the Approved Project and would provide lodging to construction crews during the multiyear construction period. Impacts on the existing campground facilities at Basalt Campground are not anticipated, but this area was included in the impact area because it would be a contractor use area and subject to long-term closure. An additional staging area shown in Figure 2-3 is located on the south shore of San Luis Reservoir and north of Basalt Road and includes the Basalt Day Use Area and boat ramp. Existing disturbed and developed areas in this staging area could be used for equipment and materials staging during construction.

The 2019 EIS/EIR noted the access route to the two main staging areas would be via SR-152 to Basalt Road and that temporary traffic signals would be installed at the current left-turn crossing on SR-152 at Basalt Road and at the access road to Romero Visitor Center during Approved Project construction. Temporary traffic signals for crossing SR-152 are no longer being considered as part of the Approved Project at this time. The description provided in the 2019 EIS/EIR estimated that up to 59 large deliveries or off-site waste material transports to local landfills and regional hazardous waste landfills per day could be expected, along with regular commuting of construction personnel.

The Approved Project entails developing new temporary roads and improving existing roads for hauling and construction access. New roads would be cleared and existing roads would be improved and would be either paved or treated to prevent dust. Roads would be approximately 30 feet wide with approximately 100 feet of clearance.

2.3.2.5 Restriction of Reservoir Level and Seasonal Timing

The water elevation at San Luis Reservoir fluctuates seasonally as water is pumped in for storage and out for transmission to the Central Valley Project and California State Water Project. As stated in the 2019 EIS/EIR, any work that would reduce the dam embankment strength, such as foundation or embankment excavation, would be timed to occur when pressure on the dam is at a minimum (i.e., during periods of the year when the reservoir is drawn down to low storage levels as part of normal reservoir operations). Such work would be completed each year prior to refilling the reservoir. To the extent possible, work would be scheduled each year to be completed during one drawdown season to allow the reservoir to be refilled to seasonally high storage levels and ensure minimal disruption to water deliveries.

Excavation of the berm foundation down to bedrock to construct the SVS shear key would require limits on the maximum surface elevation in San Luis Reservoir that would extend across two reservoir-filling seasons. This reduction in surface elevation would reduce storage capacity in the reservoir and could limit Central Valley Project and California State Water Project deliveries during this prolonged limited storage period.

2.3.3 Construction Schedule and Assumptions

As stated in the 2019 EIS/EIR, construction of the Approved Project is expected to last approximately 8 to 10 years, assuming no funding constraints are encountered. The 2019 EIS/EIR assumed work would commence in 2020 and would likely be completed within 10 to 12 years and up to 20 years if funding constraints are encountered; note that actual construction will occur later than originally assumed.

Work would be performed 24 hours per day, 7 days per week, 12 months per year. The 24-hour workday would consist of two 10-hour work shifts, with one 30-minute lunch break each shift, plus a 3-hour maintenance period. It was assumed in the 2019 EIS/EIR that 46 workers would be on site during the dayshift and 30 workers would be on site during the nightshift. Blasting operations at the Basalt Hill Borrow Area would be limited to the hours between 6:00 a.m. and 6:00 p.m.

As indicated in the 2019 EIS/EIR, the following equipment would be used to construct the Approved Project:

- Three excavators
- Four bulldozers
- Five cranes/lifts
- Five compactors
- Two graders
- Two scrapers
- Five loaders (2 small, 3 large)
- Nine dump trucks
- Five water trucks
- Truck-mounted drill rig

The total acreage of disturbed ground is estimated in the 2019 EIS/EIR at up to approximately 3,905 acres, including the crest of the dam, the entire downstream slope of the dam, borrow areas, haul routes, site access, and potential construction use areas.

2.3.4 Project Operation

As noted in the 2019 EIS/EIR, following completion of construction of the Approved Project, operation of San Luis Reservoir will continue consistent with the existing configuration with no change in storage capacity at the reservoir. No changes in facility maintenance are identified in the 2019 EIS/EIR that could occur as a result of the Approved Project.

2.4 Proposed Project Modifications and Clarifications

This section describes the modifications to the Approved Project since certification of the 2019 EIS/EIR, which are the subject of this SEIR as described in Chapter 1, Introduction. Features of the Modified Project are shown in Figures 2-4A and 2-4B, Modified Project Detail, and a comparison to the work area and features of the Approved Project are shown in Figure 2-3.

The dam stability features detailed in Section 2.3, Description of the Approved Project, including the stability berms, foundation shear keys, and dam crest raise, remain largely unchanged in the Modified Project, as do overall assumptions of equipment, personnel, workday schedules, and overall construction schedule. In certain cases, supplemental details or clarification regarding components of the Approved Project, such as eliminating the shear key at the SVS and reducing the depth of other shear keys, are presented to ensure that minor changes in the Approved Project are appropriately defined, but these changes are minor and within the scope of the analysis conducted in the 2019 EIS/EIR and are not subject to analysis in the SEIR. The focus of the modifications to the Approved Project addressed in this SEIR are additions of project-related impacts outside the prior study area and the addition of materials excavation sites within the previous study area—referred to collectively in this SEIR as additional impact areas. The latest set of project plans is provided in Appendix A. It should be noted, however, that Reclamation is currently working with CDPR to design the proposed campground and improvements to the San Luis Creek Day Use Area, as described below in Section 2.4.1; therefore, detailed plans for these facilities are not available and are not included in Appendix A.

2.4.1 Additional Impact Areas – Campground Construction and Day Use Area Improvements

The Modified Project addressed in this SEIR would entail construction activity on the western shore of O'Neill Forebay, in the areas shown on Figure 2-4A, associated with development of a new public campground and minor upgrades to the existing San Luis Creek Day Use Area. This work was identified in the 2019 EIS/EIR as part of Mitigation Measure REC-1, but implementation of that mitigation entails environmental impacts that were not incorporated into the analysis presented in the 2019 EIS/EIR, so they are included in the scope of this SEIR. Mitigation Measure REC-1 in the 2019 EIS/EIR included the expansion of the boat launch at Dinosaur Point Use Area. Since that time, CDPR has indicated the previously proposed expansion of this boat launch is no longer required, as the existing facility has excess capacity and would accommodate any increase in use due to the closure of the Basalt Campground boat launch for the duration of Modified Project construction (CDPR 2020). As such, changes to the Dinosaur Point Use Area boat launch facility are not part of the Modified Project addressed in this SEIR.

DWR, in consultation with CDPR, has agreed to construct a new permanent campground on the northwestern shore of O'Neill Forebay to compensate for the long-term temporary closure of Basalt Campground and the Medeiros Use Area during Modified Project construction. Basalt Campground will be closed to avoid disruption to campground users that could result from blasting operations at the Basalt Hill Borrow Area during Modified Project construction, and to allow for use of the campground facility for equipment and materials staging and lodging for construction personnel. The 2019 EIS/EIR assumed that the Medeiros Use Area (and campground) south of O'Neill Forebay would be closed during the entire construction phase of the Approved Project; the 2019 EIS/EIR addressed the potential impacts of this closure. However, the Medeiros Use Area was inadvertently not included in the Approved Project footprint as shown in the exhibits and figures of the 2019 EIS/EIR. As such, the Medeiros Use Area is included in the Modified Project footprint in this SEIR; however, note that impacts resulting from its closure have already been addressed in the 2019 EIS/EIR.

The proposed site for the new campground is an undeveloped grassland area bisected by an existing paved road on the west side of O'Neill Forebay that provides access to recreational facilities along the west side of O'Neill Forebay and to the San Luis Creek RV Campsite north of the proposed campground area.

The new campground proposed as part of the Modified Project is in the conceptual design stage. The site, which is shown on Figures 2-3 and Figure 2-4A, is approximately 40 acres (24 acres for the campsite areas and 16 acres for utilities) and would include 79 campsites, including 73 tent sites and 6 hookup sites compliant with the Americans with Disabilities Act. Two restroom and shower buildings would be constructed, along with a campfire center, overflow parking, and realignment of the existing bike path along the shoreline. Shore access for fishing would also be provided. The work to construct the campground would include vegetation removal and site grading; installation of utilities including sewer/septic (including a lift station), water, and electrical; surfacing roadways and vehicle parking areas with asphalt; and constructing restrooms and associated campground and campsite amenities (e.g., picnic tables, fire rings). The facilities would be managed by CDPR as part of the San Luis Reservoir State Recreation Area. The new campground would operate similarly to existing campgrounds in the San Luis Reservoir State Recreation Area; anticipated visitation rates, campsite usage, and demand for utilities are estimated from existing campgrounds.

To compensate for Modified Project-related closure of the Basalt Day Use Area for the duration of construction, DWR and Reclamation would also make improvements to the existing San Luis Creek Day Use Area, a developed facility that is located south of the newly proposed campground. Improvements made as part of the Modified Project would be within the existing developed facility and would include provision of an additional boat launch lane and boarding float, a fish-cleaning station, and a new replacement restroom facility. The existing San Luis Creek Day Use Area has been added to the SEIR study area, but Modified Project-related disturbance would not occur throughout the entire facility and would be limited to areas receiving the improvements, as subject to additional planning and design by DWR and CDPR. Disturbance associated with these improvements would be limited to minor site preparation for improvements. The existing access road immediately adjacent to the main access to the San Luis Creek Day Use Area would be resurfaced. Staging areas for construction would be within existing paved parking lots in the use area. The schedule for construction of the proposed improvements is estimated to start in 2022 and take 12 to 18 months to complete.

2.4.2 Changes in Borrow Area Location

The Modified Project includes materials extraction for dam construction from two more borrow areas, in addition to those identified as part of the Approved Project in the 2019 EIS/EIR (Borrow Area 6 and the Basalt Hill Borrow Area). The additional borrow areas, referred to as Borrow Area 12 and Borrow Area 14, are shown on Figures 2-3

and 2-4B. Geotechnical investigations and materials testing are underway at all four prospective borrow areas, and depending on the testing results and the presence of suitable materials, it is possible that some combination of all four borrow areas would be used for sourcing materials during Modified Project construction. Borrow Area 12 and Borrow Area 14 are within the overall construction footprint identified in the 2019 EIS/EIR, but were identified in that document and analyzed as anticipated contractor staging areas. Additional environmental impact analysis and disclosure is warranted due to the potential scale of Modified Project-related activity at these sites, including excavation, export of materials, and changes to the existing landform that would occur as a result of removing materials from these additional borrow areas.

Borrow Area 12 is approximately 28 acres in size. It includes a grassland-covered hill east of the dam's SVS that is approximately 100 feet higher than the surrounding lower-lying area. The top of the hill is flat, having been used in the past as a borrow area for initial construction of B.F. Sisk Dam, with two unpaved roads leading to the top. Borrow Area 14 is approximately 200 acres in size. It is located south of Borrow Area 12 and is situated around four low hills within grassland. One of the hills has a road leading to the top. Utility lines and poles in the area would not require relocation as part of the Modified Project.

Borrow Areas 12 and 14 are closer to the dam construction site than Borrow Area 6, and existing roads allow for access from these borrow areas to the dam. Hauling materials from these borrow areas would be preferable for construction because it would reduce the length of haul trips and would not require crossing SR-152 to deliver fill to the dam site. If testing determines that materials from these borrow areas are suitable, their use would reduce or avoid the need for longer haul trips across SR-152.

Materials extraction at Borrow Areas 12 and 14 is intended to preserve the existing topographic contours of the borrow areas to the greatest extent practicable, with the elevation of the existing hills and ridges being lowered up to 25 feet from their current elevations. If Borrow Area 14 is used, excavation would be minimized at the lower elevations and defined drainage areas between the hills. Up to 7 million cubic yards of material would be removed from these borrow areas if the materials testing determines that they contain suitable material for construction. As part of the Modified Project, a remediation plan would be prepared and implemented for Borrow Area 6, Borrow Area 12, and Borrow Area 14. The restoration plan would include measures to revegetate and perform final grading to achieve a naturalized appearance and topography.

Near the Basalt Hill Borrow Area, the Modified Project also includes addition of a new work area proposed for stockpiling extracted materials prior to transporting the materials to the dam construction zone. Like the larger Basalt Hill Borrow Area, this area, shown on Figure 2-4B, was used to extract materials for the original dam construction. An existing access road from Basalt Road would be widened and improved for hauling use as part of the Modified Project.

2.4.3 Minor Additions to Contractor Work Area

The Modified Project boundary includes some minor expansion of contractor work areas downstream of the dam that were not part of the original study area addressed in the 2019 EIS/EIR. These additions, which are based on recent planning refinement conducted by Reclamation and DWR, are shown in Figures 2-4A and 2-4B and total approximately 41 acres.

Another small area of less than 1 acre has been added to the original Approved Project study area immediately west of the dam's right abutment. This area, shown in Figure 2-4B, is a portion of the footprint of the alignment of an existing road that crosses San Luis Reservoir and is exposed when the reservoir is at a low water level. The

existing road would be used to transport materials from the Basalt Hill Borrow Area to the dam construction zone during periods when the reservoir water level is low enough to expose the road. Most of the road alignment is within the 2019 EIS/EIR study area, but a small area was excluded, and is considered under the Modified Project and addressed in this SEIR.

In total, the Modified Project's impact area is estimated at approximately 4,243 acres, an increase of 338 acres from the 3,905 acres identified in the 2019 EIS/EIR. It should be noted that the acreage of Borrow Areas 12 and 14 were included in the area of impact identified in the 2019 EIS/EIR, but these areas were identified in that document as contractor use areas and not envisioned to be used for quarrying materials for dam construction. As analyzed in this SEIR, most impacts of the Modified Project would be temporary, with borrow areas and staging areas subject to remediation to a naturalized condition following completion of construction work. Permanent impacts would occur in areas at the foot of the dam that would be covered by new downstream stability berms and the expanded dam embankment, areas of widened access roads, and within the footprint of the proposed new campground and new San Luis Creek Day Use Area facilities west of O'Neill Forebay. While Borrow Areas 12 and 14 would be remediated to a naturalized condition and are considered temporary impact areas, excavating and exporting materials would result in a permanent change in the landform and topography of the borrow areas. It should also be acknowledged that efforts are being made to reduce unnecessary disturbance and habitat impacts and that the overall disturbance area will likely be less than the conservative estimates provided above.

2.4.4 Additional Construction Assumptions

As noted above, the overall construction schedule and assumptions regarding personnel and equipment remain unchanged by the Modified Project. With respect to the new features included in the Modified Project, campground development and improvements are anticipated to take 18 months and be accomplished by up to 20 construction personnel working standard 8-hour dayshifts. Equipment to be used for the campground and improvements work would include equipment as identified in the 2019 EIS/EIR (see Section 2.3.3, Construction Schedule and Assumptions).

Construction would use water from the reservoir and forebay for proposed construction purposes and dust suppression. It is anticipated that submersible pumps would be mounted to a floating platform and powered either through generators or grid power. These pumps would be screened per National Marine Fisheries Service standards to avoid impacts to fish.

With respect to timing of dam improvement construction, the 2019 EIS/EIR mentioned restrictions based on water level for certain work that would occur at the base of the dam with potential to affect the structural integrity of the dam, but the description of the Approved Project did not go into detail on this subject. For clarification purposes in this SEIR, this work at the base of the dam would occur during periods when the reservoir is naturally below elevation of 480 feet. The elevation of the reservoir typically falls below 480 feet in June or July and remains below this level through November or December, depending on weather. Construction may occur at other times of the year, provided the surface level of the reservoir is below an elevation of 480 feet, but the surface level would not be manipulated to achieve or maintain that elevation. Work that does not affect the stability of the dam may occur outside of this timeframe and at surface elevations at or above 480 feet.

2.4.5 Mitigation Site(s)

Potentially significant impacts to sensitive biological resources and regulated aquatic resources resulting from the Approved Project were identified in the 2019 EIS/EIR. Mitigation measures were incorporated into the Approved Project that required compensatory mitigation for impacts to special-status plants (Mitigation Measure TERR-1), special-status amphibians (Mitigation Measure TERR-3), Swainson's hawk (*Buteo swainsoni*) (Mitigation Measure TERR-7), golden eagle (*Aquila chrysaetos*) and California condors (*Gymnogyps californianus*) (Mitigation Measure TERR-8), San Joaquin kit fox (*Vulpes macrotis mutica*) (Mitigation Measure TERR-12), vernal pool fairy shrimp (*Branchinecta lynchi*) or vernal pool tadpole shrimp (*Lepidurus packardii*) habitat (Mitigation Measure TERR-14), and jurisdictional wetlands or waters (Mitigation Measure TERR-16). With the exception of compensatory mitigation to special-status amphibian aquatic habitat (California tiger salamander [*Ambystoma californiense*] and California red-legged frog [*Rana draytonii*]), which recommended that mitigation areas be located within a California red-legged frog recovery area, as identified in the California Red-legged Frog Recovery Plan (USFWS 2002), no specific mitigation sites were identified as part of the 2019 EIS/EIR mitigation measures.

The Modified Project would purchase mitigation lands at mitigation banks approved by the permitting agencies to satisfy the compensatory mitigation requirements of the 2019 EIS/EIR. The purchase of lands in established mitigation banks for the purpose of preservation would not otherwise require additional changes to the physical environment.

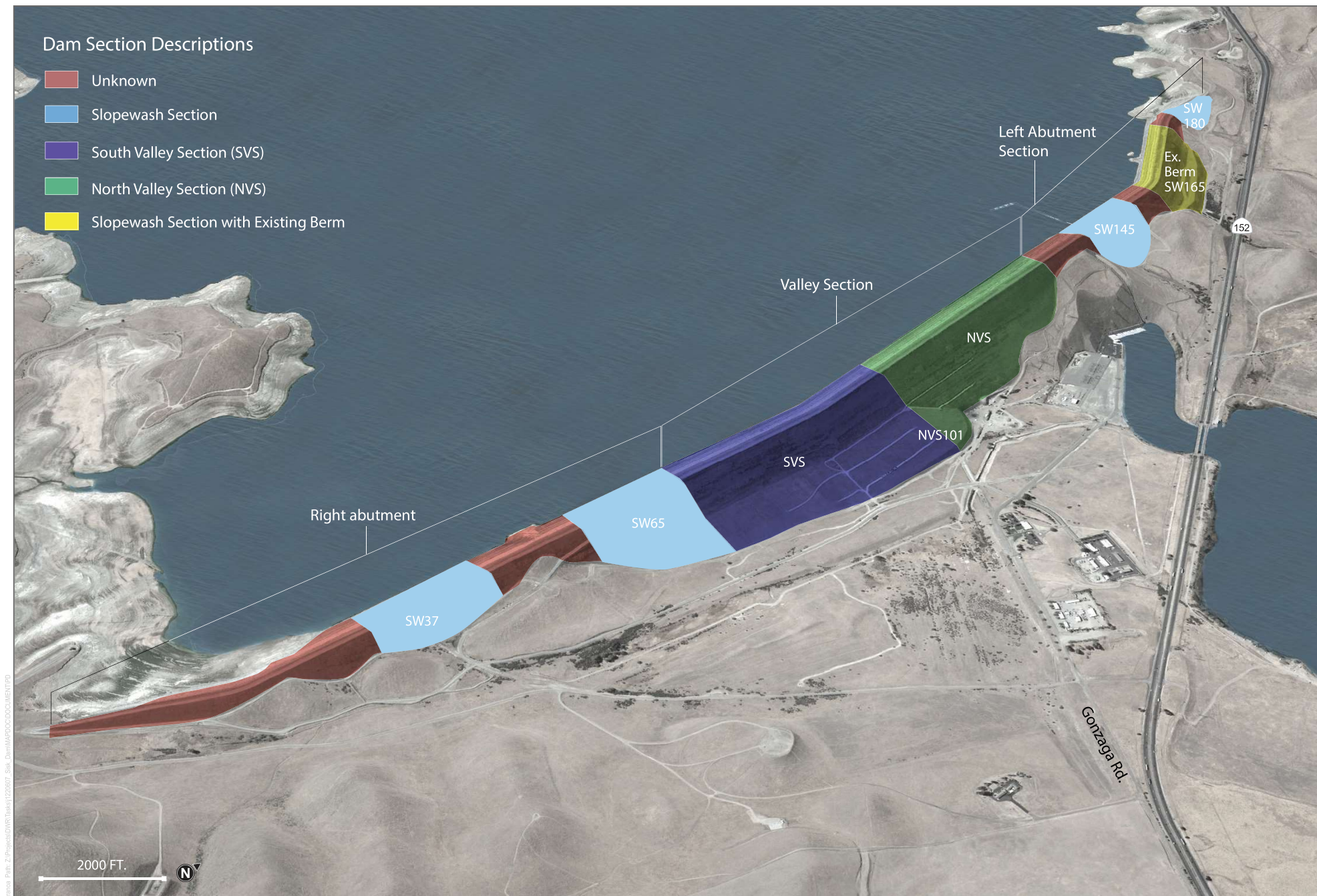
2.5 Discretionary Actions

A list of permits anticipated for the Approved Project is presented as Table 1-1 of the 2019 EIS/EIR. An updated list for the Modified Project is shown in Table 2-1.

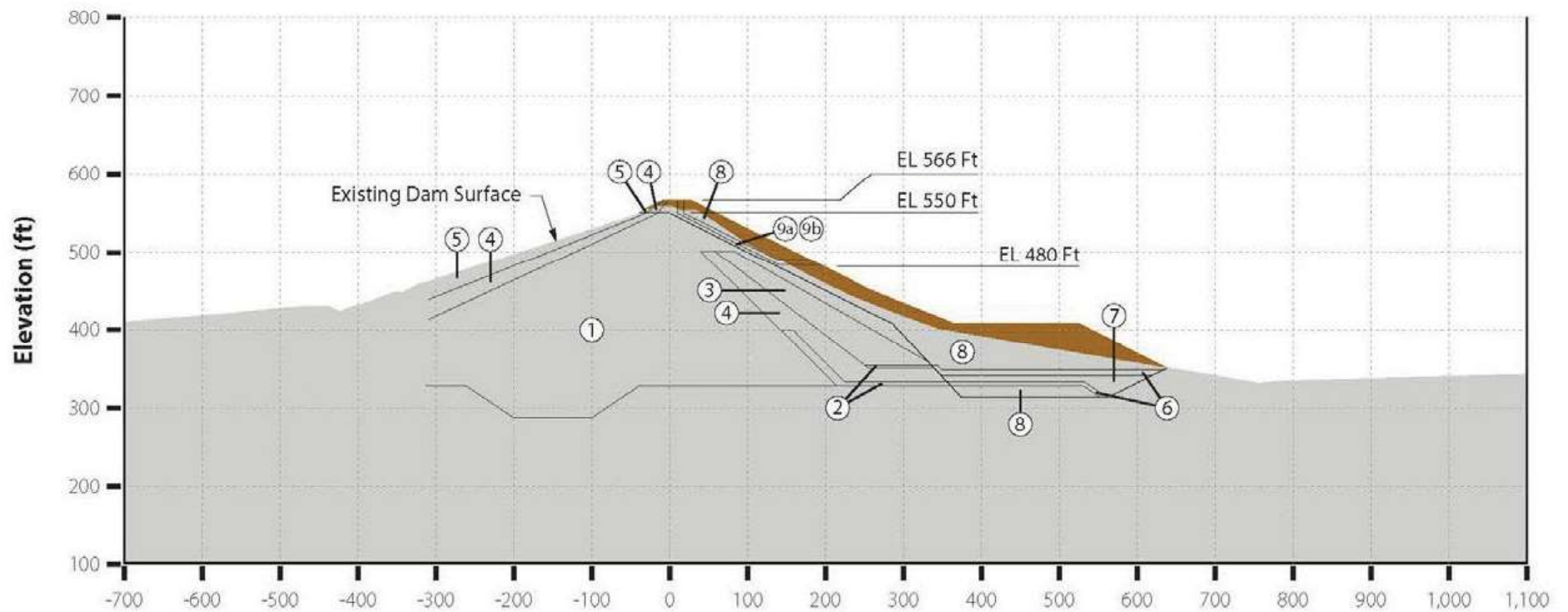
Table 2-1. Anticipated Permits or Approvals for the Modified Project

Approving Agency(s)	Permit or Approval	Applying Agency
USFWS	Federal Endangered Species Act Formal Consultation	Reclamation
CVRWQCB	Clean Water Act Section 401 Certification	Reclamation/DWR
USACE	Clean Water Act Section 404 Permit	Reclamation
CDFW	California Fish and Game Code Section 2081 (b) Incidental Take Permit	Reclamation/DWR
CDFW	California Fish and Game Code Section 1602 Lake and Streambed Alteration Agreement	Reclamation/DWR
SHPO and/or ACHP	NHPA Section 106 Compliance	Reclamation
CVRWQCB	NPDES Permit for General Construction	Reclamation/DWR
CVRWQCB	NPDES/WDR Individual Permit for Discharge	Reclamation/DWR
SJAPCD	Clean Air Act Fugitive Dust Control Plan & Indirect Source Review Air Impact Assessment	Reclamation/DWR
Caltrans	Encroachment Permit for work in State Route 152 right-of-way	Reclamation/DWR
CVRWQCB	Construction dewatering discharge permit	Reclamation/DWR

Notes: USFWS = U.S. Fish and Wildlife Service; Reclamation = Bureau of Reclamation; CVRWQCB = Central Valley Regional Water Quality Control Board; DWR = California Department of Water Resources; USACE = U.S. Army Corps of Engineers; CDFW = California Department of Fish and Wildlife; SHPO = State Historic Preservation Officer; ACHP = Advisory Council on Historic Preservation; NHPA = National Historic Preservation Act; NPDES = National Pollutant Discharge Elimination System; WDR = water discharge requirement; SJAPCD = San Joaquin Air Pollution Control District; Caltrans = California Department of Transportation; WAPA = Western Area Power Administration.



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- Zone 1 (central zone): clay
- Zone 2: embankment filter
- Zone 3: shell
- Zone 4: upstream bedding
- Zone 5: upstream rip rap
- Zone 6: filter sand
- Zone 7: miscellaneous fill
- Zone 8: downstream shell
- Zones 9a and 9b: filter sands



SOURCE: Reclamation 2019

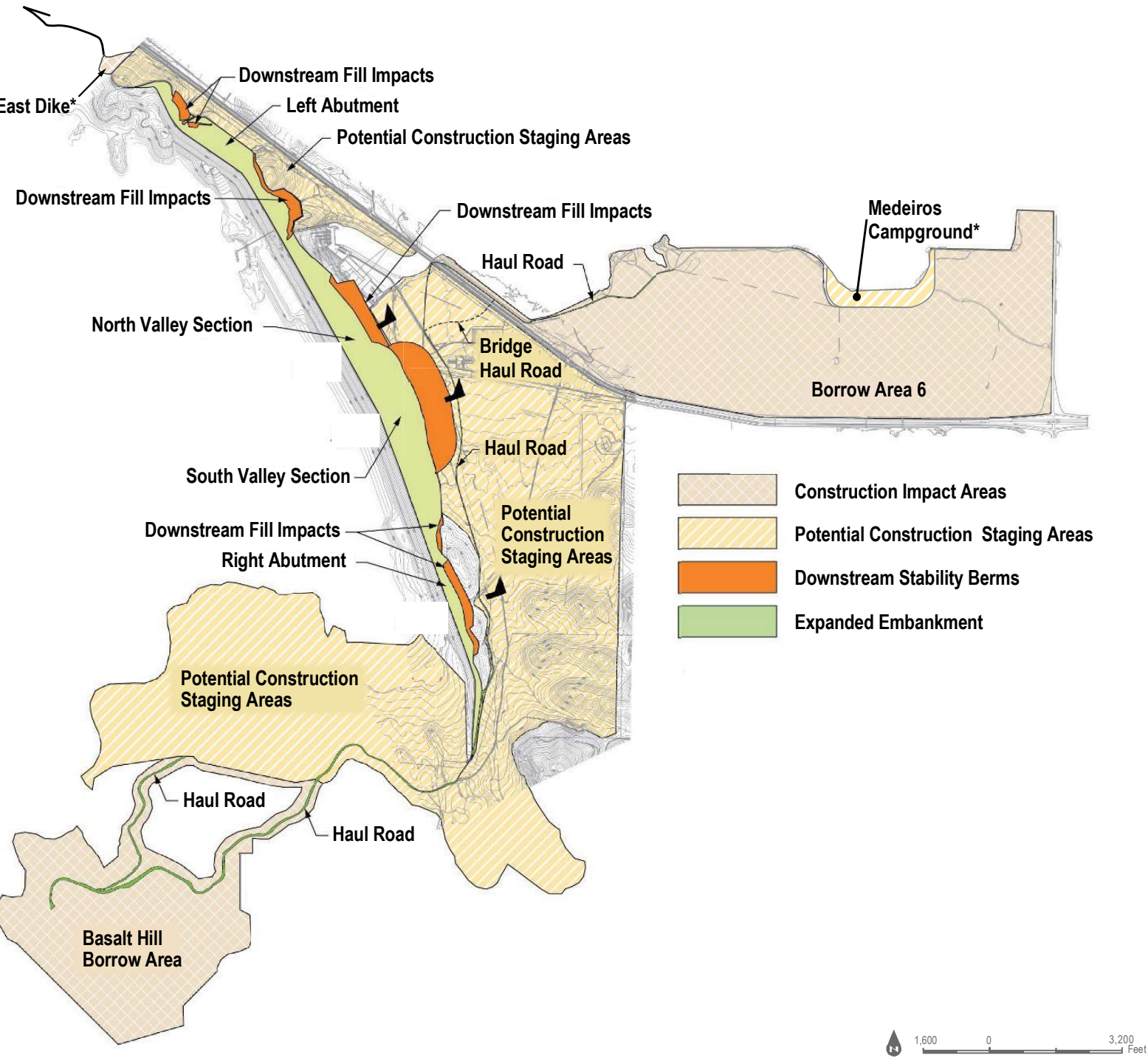
FIGURE 2-2

Existing Dam Cross-Section

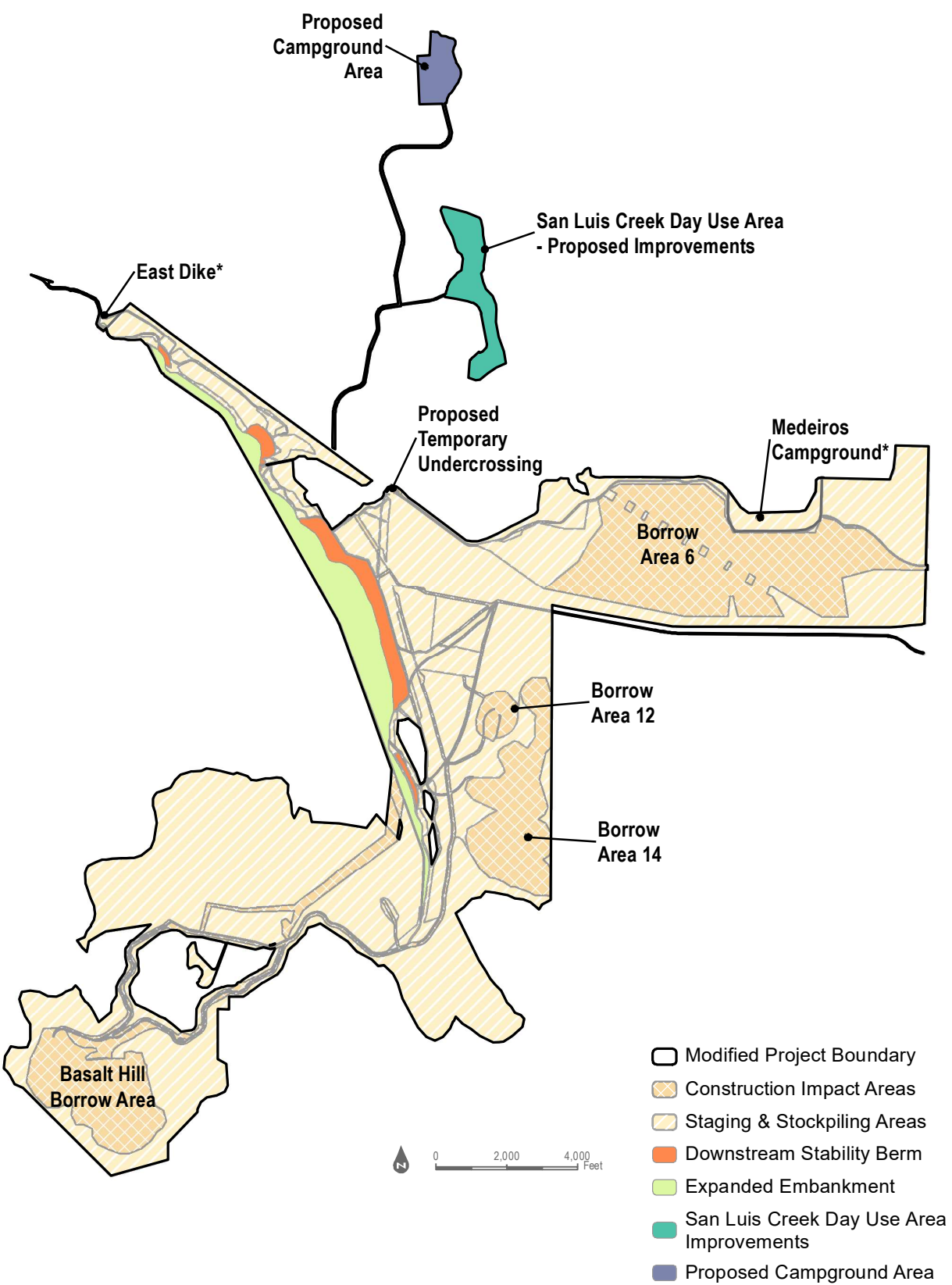
B.F. Sisk Dam Safety of Dams Modification Project SEIR

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Approved Project Footprint



Modified Project Footprint



*The 2019 EIS/EIR analyzed impacts of the project within the East Dike and Medeiros Campground area but did not include these areas in mapping of the project footprint. These areas have been added to the Approved Project footprint to correct this mapping omission.

SOURCE: Approved Project: Figure 2-2, 2019 EIS/EIR, Revised Project Boundary & Features: USBR, 6/4/20

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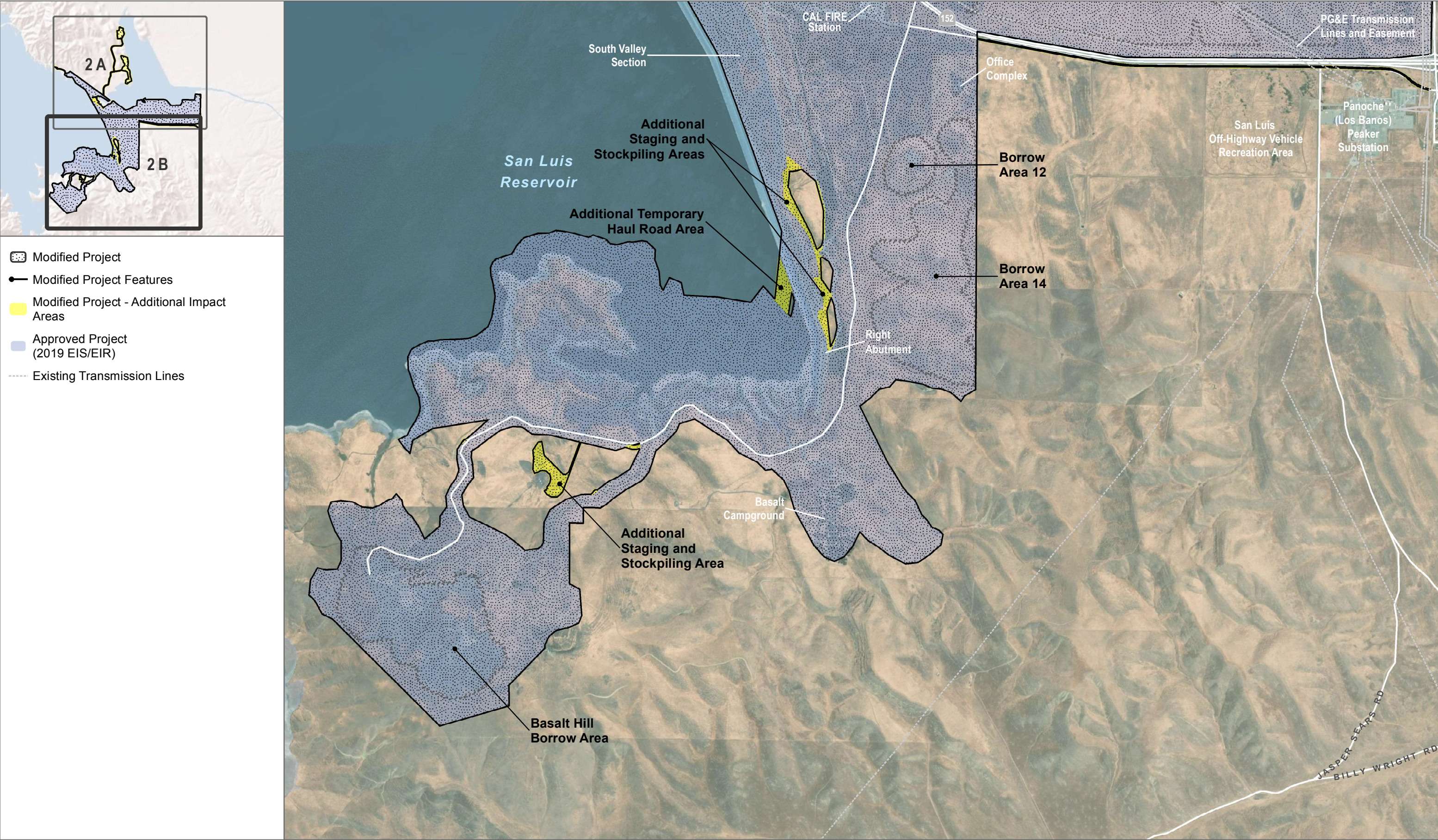


SOURCE: Basemap: ESRI World Imagery
 Project Boundary: Reclamation, 3/14/20
 Previous Boundary: DWR, 4/2019

DUDEK 0 1,000 2,000 Feet

FIGURE 2-4A
Modified Project Detail
 B.F. Sisk Dam Safety of Dams Modification Project SEIR

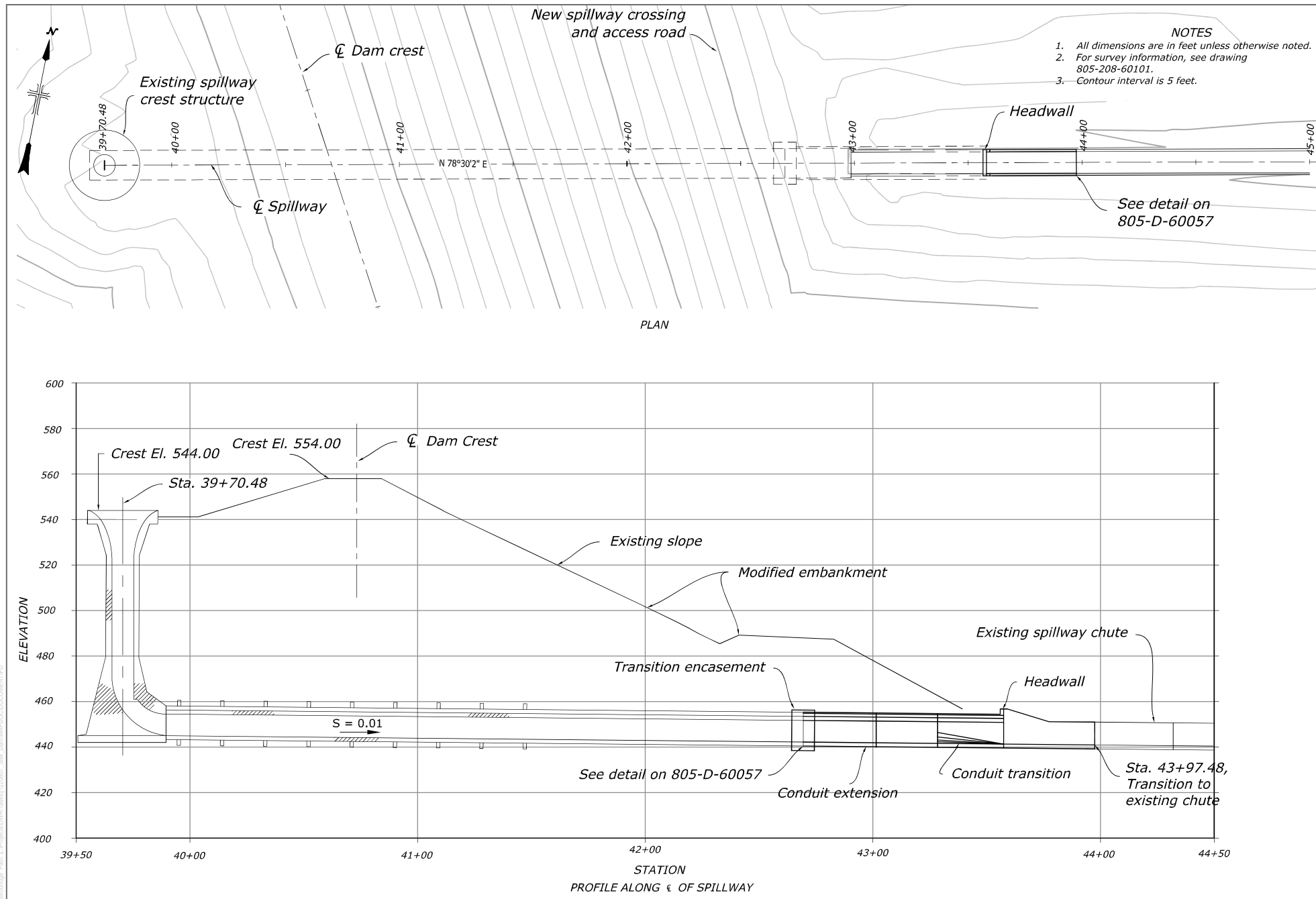
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SOURCE: Basemap: ESRI World Imagery
Project Boundary: Reclamation, 3/14/20
Previous Boundary: DWR, 4/2019

FIGURE 2-4B
Modified Project Detail
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SOURCE: Reclamation 2/26/20

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