7 ALTERNATIVES

7.1 ALTERNATIVES DEVELOPMENT

This chapter describes alternatives to the proposed project and compares the environmental impacts of those alternatives. Alternatives that were considered but rejected are also presented. Project alternatives were developed to reduce or eliminate the significant or potentially significant adverse environmental effects identified as a result of the proposed project, while still meeting most if not all of the basic project objectives. This chapter presents CEQA requirements regarding alternatives analysis, project objectives, alternatives development process, alternatives considered but dismissed from further evaluation, alternatives selected for detailed evaluation, and the comparative effects of the alternatives relative to the proposed project. The alternatives evaluated in detail are:

- No-Project/No-Build Alternative—no financing available and no levee improvements would occur
- No-Action/Federal Project Alternative
- Limited Footprint Alternative

As required under California Code of Regulations (CCR) Section 15126.6(e) of the State CEQA Guidelines, an environmentally superior alternative is identified and addressed at the end of this chapter.

7.1.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT REQUIREMENTS

CCR Section 15126.6[a] of the State CEQA Guidelines requires that an EIR (1) describe a range of reasonable alternatives to a proposed project, or to the location of the project, that would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects of the project and (2) evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a proposed project but must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation.

The range of alternatives required to be evaluated in an EIR is governed by a “rule of reason” that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The EIR need examine in detail only those alternatives that the lead agency determines could feasibly attain most of the basic project objectives, taking into account factors that include site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or regulatory limitations; jurisdictional boundaries; and whether the project proponent can reasonably acquire, control, or otherwise have access to the alternative site (State CEQA Guidelines CCR Section 15126.6[f]). CEQA does not require the alternatives to be evaluated at the same level of detail as the proposed project.

The State CEQA Guidelines recommend that an EIR should briefly describe the rationale for selecting the alternatives to be discussed, identify any alternatives that were considered by the lead agency but were rejected as infeasible, and briefly explain the reasons underlying the lead agency’s determination (State CEQA Guidelines CCR Section 15126.6[c]).

An EIR must also evaluate a “no-project” alternative, which represents “what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.” (State CEQA Guidelines CCR Section 15126.6[e][2]).
The following are the significant environmental impacts of the proposed project that the alternatives seek to eliminate or reduce:

- Damage to Scenic Resources within State- or County-Designated Scenic Highways;
- Changes in Scenic Vistas and Existing Visual Character;
- Conversion of Agricultural Land, including Important Farmland, to Nonagricultural Uses;
- Damage to or Destruction of Known Historical Built Environment Resources;
- Potential Exposure of Persons to or Generation of Noise-Levels in Excess of Standards Established in the Local General Plan or Noise Ordinance, or in Other Applicable Local, State, or Federal Standards;
- Potential Exposure of Persons to or Generation of Excessive Groundborne Vibration or Groundborne Noise-Levels;
- Potential for Substantial Temporary or Periodic Increase in Ambient Noise-Levels in the Project Vicinity Above Levels Existing without the Project; and
- Cumulatively Considerable Incremental Contributions to Significant Cumulative Impacts Related to:
  - short-term degradation of visual character or adverse changes to scenic vistas from rock revetment/berms on the waterside of levees in the Sacramento River East Levee Improvements area;
  - permanent degradation of visual character or adverse changes to scenic vistas from vegetation removal;
  - conversion of Important Farmland to a non-agricultural use from the Conservation Strategy;
  - conversion of forestland to non-forest uses from the Conservation Strategy; and
  - damage to or destruction of known historical built environment resource from the removal of the Victory Trees along State Route 160.

7.1.2 **PROJECT OBJECTIVES**

An EIR must evaluate a reasonable range of alternatives to the proposed project, or to the location of the proposed project, which could feasibly attain most of the basic objectives of the proposed project but would avoid or substantially lessen any of the significant effects of the proposed project, and evaluate the comparative merits of the alternatives (State CEQA Guidelines, CCR Section 15126.6). Project objectives are the cornerstone for formulating and screening potential project alternatives. The proposed project has two key project objectives:

1. **Levee Accreditation.** Over the next 5–7 years, implement the elements necessary to ensure that levees along the Lower American and Sacramento Rivers and their tributaries outside the Natomas Basin can be operated in concert with Folsom Dam to meet National Flood Insurance Program (NFIP) Levee Accreditation requirements and urban levee flood requirements under applicable State law.
2. **Conservation Strategy.** Implement Levee Accreditation in a manner that protects the natural environment, especially riparian habitat and stream channels suitable for native plants, wildlife habitat, and public recreation.

In developing alternatives to meet these project objectives, several basic parameters were required:

- The project must be economically feasible.
- The project must consider and minimize temporary, short-term construction impacts.
- The project must consider environmental constraints and minimize environmental impacts as practicable.
- The project must consider real estate and encroachment constraints and minimize property (right-of-way) impacts as practicable.
- The project must achieve acceptance by agencies with jurisdiction, primarily including the Federal Emergency Management Agency (FEMA), Central Valley Flood Protection Board (CVFPB), U.S. Army Corps of Engineers (USACE), and the California Department of Water Resources (DWR) (e.g., meeting FEMA 1-percent-annual-chance [100-year] and Urban Levee Design Criteria [ULDC] geotechnical criteria).

### 7.1.3 Alternatives Development Process

Alternatives were developed with the goal of meeting NFIP Levee Accreditation requirements and urban levee flood criteria requirements under applicable State law. SAFCA and USACE levee evaluations have identified specific deficiencies outside of the Natomas Basin that require improvements to meet Federal and State flood requirements. Consequently, this effort is focused on those specific levee deficiencies along the American River, the east side of the Natomas East Main Drainage Canal (NEMDC)/Steelhead Creek, Arcade Creek, Dry Creek North Levee, Robla Creek South Levee, the Lower Sacramento River from the mouth of the American River to the community of Freeport, and the Beach Lake Levee. Alternatives for improving levees are necessarily constrained geographically to the sites which require remediation; the astronomical costs, adverse environmental effects, and infeasibility of building entirely new levees (or relocating people and structures that existing levees protect) limit feasible levee remediation alternatives to the type of treatment to use at each site. Alternatives for high-hazard tree and encroachment removal are also extremely limited as specific trees and encroachments have been identified and require removal to meet Federal and State criteria.

SAFCA has undertaken thorough and detailed alternatives evaluations to determine levee reaches requiring remediation and the best remediation measures for each specific levee reach requiring mediation for the Sacramento River East Levee Improvements area (GEI Consultants, Inc. 2014; MBK Engineers 2014; Kleinfelder 2013a; Kleinfelder 2013b) and the North Sacramento Streams Improvements area (URS Corporation 2013; URS Corporation 2014a). Levee reaches were initially screened to determine whether the reaches met or did not meet Federal and State criteria. Those levee reaches in the North Sacramento Streams and Sacramento River East Levee Improvements areas that did not meet criteria were subject to evaluations to determine the best and most cost-effective treatments. Assessing the various remediation treatments is a vital component in formulating alternatives to properly address levee deficiencies. Multiple levee improvement alternatives were considered for each deficient reach for the purpose of analysis and costing. Improvement alternatives were developed to address seepage (underseepage and/or through-seepage) and landside slope stability.
URS Corporation developed standardized conceptual improvement alternatives in a technical memorandum entitled *Conceptual Levee Repair Alternatives and Cost Estimating* (URS Corporation 2014b). USACE design guidance documents (USACE 2000; USACE 2003; USACE 2005), and recent levee design and evaluation projects in the Central Valley also served as guides for developing standardized improvement alternatives. The potential remediation measures being considered as possible treatments for identified levee deficiencies were screened against several parameters to assess which levee remediation measure would be recommended for implementation. In addition to screening against the basic parameters presented in the section above, “Project Objectives,” the following additional parameters were used in the comparative evaluation of alternatives:

- Performance of proposed remedial measure in addressing the identified deficiency(ies) (resiliency and redundancy);
- Readily implementable (including site accessibility and constructability);
- Minimize comparable costs;
- Minimize environmental impacts;
- Minimize impacts to residences, businesses, and local government agencies;
- Maximize flexibility to changing criteria (robustness); and
- Regulatory acceptance.

Alternative levee remediation treatments evaluated extensively for each problem reach were similar for both the Sacramento River East Levee and North Sacramento Streams Improvements areas (GEI Consultants, Inc. 2014, Appendix A; URS Corporation 2013; URS Corporation 2014b) as follows:

- Cutoff walls
  - Cutoff wall to tie into impervious layer
  - Cutoff wall to tie into semipervious layer
  - Shallow cutoff wall to tie together blanket
  - Steel or vinyl sheet piles for shallow cutoff walls (considered but rejected)

- Pressure relief systems
  - Passive relief wells
  - Pumped relief wells
  - Toe drain trench (considered but rejected)

- Seepage berms

- Shallow drainage and stability berms
  - Toe drain
  - Landside drained stability berms

Given individual levee site constraints, it is anticipated that cutoff walls would likely be the default improvement for underseepage deficiencies. However, alternatives such as relief wells and/or pumped wells may be more
desirable in some reaches to reduce environmental impacts, construction impacts, and/or cost, or where aquifers are so deep that they cannot be effectively cut off by cutoff walls. Depending on the site-specific conditions at each reach, one or more of the remediation treatments above were proposed for each reach to develop the proposed project and alternatives.

### 7.1.4 Alternatives Considered but Rejected from Detailed Analysis

#### Adjacent Levee

Improvement of levee problems through an adjacent levee avoids costs associated with vegetation removal on the original levee. The adjacent levee raise would involve constructing a new embankment adjacent to the existing levee. A minimum 5-foot-wide shoulder would extend from the landside edge of the crown of the existing levee to the water side of the new adjacent setback levee embankment. A 3H:1V slope would extend up to the crown of the adjacent setback levee. The crown would be at least 20 feet wide and would be topped with an aggregate base access road for inspection and maintenance. The adjacent setback levee would have a 3H:1V landside slope. It would be constructed of compacted random fill material from borrow sources and from the excavation of the existing landside stability berm.

Adjacent levees were considered to be infeasible because of the high costs and substantial impacts in urban areas where homes are immediately adjacent to the levees. This alternative treatment was considered but rejected.

#### Toe Drain Trench

A toe drain trench would be a continuous, 4- to 6-foot-wide trench excavated along the landside levee toe extending through the surficial blanket layer and penetrating a limited depth into the aquifer. The toe drain trench would then be backfilled with permeable drainage soils (clean sand and gravel). A perforated pipe would be installed within the backfilled zone to carry water laterally to a pump station. Toe trenches may generate more flow per linear foot of levee than a system of relief wells, because the trench is continuous. This alternative is not appropriate for aquifers that are thick and have a large flow capacity, such as the one present through much of the Sacramento River East Levee. Furthermore, toe drain trenches have had poor performance history in the Central Valley, and regulators have recently discouraged their use in the project study area. This alternative treatment was considered but rejected.

#### Steel or Vinyl Sheet Piles for Shallow Cutoff Walls

Steel or vinyl sheet piles can be used for seepage cutoff applications. Sheet piles are thin pieces of steel formed into a Z or U shape in cross-section. Sheet piles are provided with an interlock at each end, so that adjacent piles can be attached, forming a continuous barrier. Steel sheet piles are typically driven to depth with an impact or vibratory hammer. Vinyl sheet piles are typically driven or pushed to depth with the aid of a steel mandrel, which is removed after driving. The main limitation for sheet piles is difficulty in driving the piles through dense soils. Steel sheet piles can be made larger and stronger to account for dense soils, but the additional steel is an added material cost. The process of driving sheet piles can also cause vibrations that may be strong enough to damage nearby structures. Even if drivability is not problematic, the maximum length of sheet pile is 80 to 100 feet for steel, so sheet pile is not appropriate for very deep aquifers. This alternative treatment was considered but rejected.
7.1.5 **ALTERNATIVES EVALUATED IN DETAIL**

The proposed project is described in detail in Chapter 3, “Project Description,” and is not discussed herein. The following project alternatives selected for evaluation are described below in Section 7.2, “Alternatives Description,” in Sections 7.2.1, 7.2.2, and 7.2.3 below:

- No-Project/No-Build Alternative—no financing available and no levee improvements would occur
- No-Action/Federal Project Alternative
- Limited Footprint Alternative

7.2 **ALTERNATIVES DESCRIPTION**

This section describes the range of reasonable alternatives to the proposed project that were evaluated in this EIR and presents how specific impacts differ in severity from those associated with the proposed project. For the most part, significant impacts of the alternatives can be reduced to less-than-significant levels through adoption of mitigation measures identified in Chapter 4, “Environmental Setting, Impacts, and Mitigation Measures,” which contains the environmental analysis of the proposed project. To varying degrees, the following alternatives would also avoid and/or lessen proposed project impacts, including some or all of the unavoidable effects of the proposed project.

Under CEQA, the No-Project Alternative is the existing condition at the time the notice of preparation was published (May 15, 2014) as modified by what would be reasonably expected to occur in the foreseeable future if the project were not approved. In the case of the proposed project, two no-project alternatives are defined, including a No-Project/No-Build Alternative, and a No-Action/Federal Project Alternative.

7.2.1 **NO-PROJECT/NO-BUILD ALTERNATIVE (NO FINANCING, NO IMPROVEMENTS)**

Under the No-Project/No-Build Alternative, SAFCA would not conduct any work to address identified and critical levee seepage, slope stability, and erosion concerns in the Sacramento metropolitan area. There would be no funding of levee improvements and no levee improvements would be made. The Sacramento metropolitan area would continue to be subject to an unacceptable high risk of levee failure and subsequent catastrophic flooding. A flood in the Sacramento metropolitan area would have substantial repercussions that would affect the entire State; the national economy; and Federal, State, and local government operations on a similar scale to the 2005 flooding of substantial portions of the New Orleans area.

Urban development within the project study area would continue to be at risk of flooding and lives would continue to be threatened. The levees within the project study area could fail and result in a catastrophic disaster. Billions of dollars in damageable property and more than 100,000 residents are located within the flood zones protected by the levees targeted by the proposed project. Flooding could also release toxic and hazardous materials, contaminate groundwater, and damage the metropolitan power and transportation grids. The disruption in transportation that could result from a major flood would likely affect several major interstate and State highways. A temporary shutdown or slowdown of many Federal, State, and local government functions would also result. In addition, displacement of residents, businesses, agriculture, and recreational areas could occur. Resulting damage could also hinder community growth, stability, and cohesion.
7.2.2 **No-Action/Federal Project Alternative**

Under this alternative, SAFCA would not implement the proposed project. Instead, the levee improvements included in the proposed project would be constructed by USACE as part of the American River Common Features (ARCF) General Reevaluation Report (GRR) project. The constructed improvements would be similar to those included in the proposed project but could involve a slightly increased project footprint in both the North Sacramento Streams Levee Improvements area and the Sacramento River East Levee Improvements area. The proposed project involves levee strengthening only with no increases in levee height. Preliminary engineering plans developed by USACE call for levee height increases in both levee improvement areas necessitating flood wall construction in the North Sacramento Streams area and some landside widening of the levee in some locations in the Sacramento River East Levee area. In addition, the USACE preliminary engineering plans anticipate that cutoff wall construction along portions of the Sacramento River East Levee that is needed to address identified underseepage vulnerabilities would require removal of the material and vegetation comprising the upper 1/2 of the levee structure to accommodate construction equipment. By contrast, the proposed project requires removal of the material and vegetation comprising the upper 1/3 of the levee structure in the Sacramento area.

It is possible that these differences in project design could be significantly narrowed if not eliminated by USACE as their project engineering and design effort unfolds. In any case, the No-Action/Federal Project Alternative is very likely to lag the proposed project in time of construction. Whereas the proposed project is anticipated to be constructed in 2017 and 2018, the No-Action/Federal Project Alternative might not be completed until 2025 based on current Federal authorization and funding capabilities. This gap in time would prolong the current exposure of people and property in the North Sacramento Streams and Sacramento River East Levee Improvements areas to an unacceptably high risk of flooding and subject these areas to high cost flood insurance requirements and restrictions on new construction under the provisions of the NFIP.

7.2.3 **Limited Footprint Alternative**

Under this alternative, cutoff walls would be installed by the deep mixing method (DMM) thereby avoiding any substantial levee degrade required for construction. Deep cutoff walls using DMM or trench remixing and deep wall (TRD) methods do not require as wide of a working platform. Levee degradation for DMM cutoff wall installations is only required as needed to develop the working platform necessary to operate the cranes and supporting equipment, typically a width of 30 to 40 feet.

The DMM method involves a crane-supported set of two to four mixing augers used to drill through the levee crown and subsurface to a maximum depth of approximately 140 feet. As the augers are inserted and withdrawn, a cement bentonite grout would be injected through the augers and mixed with the native soils. An overlapping series of mixed columns would be drilled to create a continuous seepage cutoff barrier. Once the slurry has hardened, it would be capped and the levee embankment would be reconstructed with impervious or semi-impervious soil. The Limited Footprint Alternative would be similar to the proposed project with the exception of the exclusive use of cutoff walls using DMM and TRD construction methods compared to the use of cutoff walls, pressure relief systems, seepage berms, and shallow drainage and stability berms, depending on reach-by-reach conditions, with the proposed project.
### 7.3 COMPARISON OF EFFECTS OF THE ALTERNATIVES

Table 7-1 shows a comparison of the impacts of the project alternatives and whether their impacts are lesser, similar, or greater than the proposed project for each resource area.

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Notes: B = Beneficial; LTS = Less-than-Significant Impact; PS = Potentially Significant Impact; PSU = Potentially Significant and Unavoidable Impact; S = Significant Impact; SU = Significant and Unavoidable Impact

PSU and SU impacts typically represent 1 impact per topic area. Overall assessment accounts for worst-case assessment of each topic area.

Source: Data compiled by AECOM in 2014 and 2015
7.3.1 PROPOSED PROJECT

See Chapter 3, “Project Description,” for details of the proposed project and Chapter 4, “Environmental Setting, Impacts, and Mitigation Measures,” for an analysis of the proposed project significant and potentially significant impacts.

7.3.2 NO-PROJECT/NO-BUILD ALTERNATIVE

The No-Project/No-Build Alternative would result in none of the impacts or benefits of the proposed project. Temporary and short-term impacts from major construction activities along levees and in the immediate vicinities would not occur. Significant and unavoidable impacts identified for the proposed project would not occur. However, substantial flood risk reduction benefits from the proposed project related to Levee Accreditation would not occur. Furthermore, the Conservation Strategy and the NEMDC/Steelhead Creek Corridor Management Plan (CMP) would not be implemented and related benefits to riparian habitats would not occur.

While it may seem speculative to presume that a flood would occur under the No-Project/No-Build Alternative, there is a substantially higher risk of flooding under the No-Project/No-Build Alternative compared to that under the proposed project. Flood risk analyses show that, in any given year, there is a substantially increased chance of a major flood under the No-Project/No-BuildAlternative compared to under the proposed project. A flood in the Sacramento metropolitan area would be disastrous and result in substantial environmental impacts in essentially every environmental topic area. Physical effects from the flood itself, evacuating thousands of residents, and rebuilding billions of dollars of infrastructure would create substantial significant and unavoidable impacts (direct, indirect, and cumulative) far greater than those under the proposed project, such as:

- Aesthetics – Substantial flood recovery reconstruction efforts would greatly diminish aesthetic resources.
- Agriculture and Forestry Resources – Physical flood effects would cause agricultural and forestry losses.
- Air Quality – Substantial flood recovery reconstruction efforts would cause a substantial decrease in air quality.
- Biological Resources (Fisheries) – Physical flood effects would cause direct mortality to fish.
- Biological Resources (Terrestrial) – Physical flood effects would cause direct mortality to vegetation and wildlife.
- Cultural Resources – Physical flood effects would cause substantial effects to historic resources and potentially to identified and unidentified archaeological sites.
- Geological, Soils, and Paleontological Resources – Physical flood effects would cause substantial erosion and related effects to geological and soils resources.
- Geomorphology – Physical flood effects would cause substantial erosion and effects on geomorphology.
- Greenhouse Gas Emissions – Flood recovery reconstruction efforts would cause greenhouse gas emissions.
Hazards and Hazardous Materials – Physical flood effects would substantially increase hazards and hazardous materials, especially accidental spills.

Hydrologic and Hydraulic Resources – Physical flood effects would cause substantial hydrologic and hydraulic effects at the location of the flood.

Land Use and Planning, and Population, Housing, and Employment – Flood recovery reconstruction efforts would cause a substantial effect to all these areas, requiring relocation, homelessness, and substantial loss of business and revenue. Recovery would result in generation of construction jobs, although there could be economic devastation.

Mineral Resources – Flood recovery reconstruction efforts would cause a substantial increase in the use of mineral resources.

Noise – Flood recovery reconstruction efforts would cause a substantial increase in noise and vibration.

Recreation Resources – Physical flood effects and flood recovery reconstruction efforts would cause substantial effects on recreation in the flooded areas.

Water Quality and Groundwater Resources – Physical flood effects and flood recovery reconstruction efforts would cause substantial effects on water quality.

The following impacts of the No-Project/No-Build Alternative would occur under normal conditions without flooding.

Aesthetics: Implementation of the No-Project/No-Build Alternative would not affect scenic resources within or outside of State- or County-designated scenic highways, scenic vistas, or the existing visual character of the surrounding area, and would not create any additional source of light or glare. The No-Project/No-Build Alternative would have no effect on aesthetics. This alternative would result in a lesser impact than the proposed project.

Agriculture and Forestry Resources: This alternative would not result in conflicts with any forestry resource or result in the conversion of agricultural land to nonagricultural uses. The No-Project/No-Build Alternative would have no effect on agriculture and forestry resources. This alternative would result in a lesser impact than the proposed project.

Air Quality: Because no new facilities would be constructed and no existing facilities would be altered, expanded, or demolished, the No-Project/No-Build Alternative would have no impact associated with air pollutant or odorous emissions. This alternative would result in a lesser impact than the proposed project.

Biological Resources – Fisheries: Under the No-Project/No-Build Alternative, no new facilities would be constructed and no existing facilities would be altered, expanded, or demolished. Implementation of the No-Project/No-Build/Alternative would not affect fisheries or aquatic resources. The proposed project’s Conservation Strategy and NEMDC/Steelhead Creek CMP would not be implemented. This alternative would not result in benefits that would occur with the proposed project.
**Biological Resources – Terrestrial:** Under the No-Project/No-Build Alternative, no new facilities would be constructed and no existing facilities would be altered, expanded, or demolished. Implementation of the No-Project/No-Build Alternative would not affect terrestrial resources. The proposed project’s Conservation Strategy and NEMDC/Steelhead Creek CMP would not be implemented. This alternative would not result in benefits that would occur with the proposed project.

**Cultural Resources:** No ground-disturbing activities would occur as a result of the No-Project/No-Build Alternative. Consequently, no indirect or direct impacts on cultural resources would occur. This alternative would result in a lesser impact than the proposed project.

**Geology, Soils, and Paleontological Resources:** The No-Project/No-Build Alternative would have no impact associated with geological hazards or construction-related soil erosion. All of the geotechnical hazards described in Section 4.8, Geology, Soils, and Paleontological Resources,” would remain as under existing conditions. The No-Project/No-Build Alternative would not create any conditions to increase those hazards or reduce the risks to people, structures, or the environment.

No ground-disturbing activities would occur as a result of the No-Project/No-Build Alternative. Consequently, no indirect or direct impacts on paleontological resources would occur. This alternative would result in a lesser impact than the proposed project.

**Geomorphology:** The No-Project/No-Build Alternative would have no geomorphic impacts associated with construction runoff, dewatering operations, slurry wall material, or borrow material. The No-Project/No-Build Alternative would result in no beneficial changes in local flood protection. This alternative would result in a lesser impact than the proposed project.

**Greenhouse Gas Emissions:** Because no new facilities would be constructed and no existing facilities would be altered, expanded, or demolished, the No-Project/No-Build Alternative would have no impact associated with generation of greenhouse gas (GHG) emissions. This alternative would result in a lesser impact than the proposed project.

**Hazards and Hazardous Materials:** Implementation of the No-Project/No-Build Alternative would not expose construction workers or the general public to potential release of hazardous materials into the environment. The No-Project/No-Build Alternative would have no effect on public health or hazards. This alternative would result in a lesser impact than the proposed project.

**Hydrologic and Hydraulic Resources:** The No-Project/No-Build Alternative would have no effects on groundwater levels resulting from slurry wall cutoffs, disruption of local drainage systems by seepage or stability berms, or other hydrologic impacts. However, the No-Project/No-Build Alternative would not reduce flood risks as would the proposed project. This alternative would not result in benefits that would occur with the proposed project.

**Land Use and Planning, and Population, Housing, and Employment:** The No-Project/No-Build Alternative would result in no improvements to the levees and the flood control system. This would result in impacts to NFIP eligibility. The results of losing NFIP eligibility would greatly increase the cost of insurance for home owners and potentially necessitate and/or perpetuate moratoriums on development in the region, which would impact local and regional economies of the greater Sacramento region.
This alternative would also not allow SAFCA and the Sacramento region to comply with Senate Bill (SB) 5 requirements including meeting ULDC requirements to provide a 200-year level of flood protection for an urban area. This alternative would not result in benefits that would occur with the proposed project.

**Mineral Resources:** The No-Project/No-Build Alternative would have no impact associated with mineral resources. No ground-disturbing activities would occur as a result of the No-Project/No-Build Alternative. All of the mineral resources described in Section 4.14, “Mineral Resources,” would remain as under existing conditions. The No-Project/No-Build Alternative would not create any conditions that would produce changes to these resources. This alternative would result in a lesser impact than the proposed project.

**Noise:** Under the No-Project/No-Build Alternative, no construction work would take place and therefore no construction-generated noise or vibration would result, nor would construction workers be exposed to excessive aircraft noise. No new stationary sources of noise or vibration would be created, and there would be no new source of ground-borne noise or vibration. This alternative would result in a lesser impact than the proposed project.

**Recreation:** The No-Project/No-Build Alternative would neither temporarily nor permanently affect existing recreational resources or opportunities. The No-Project/No-Build Alternative would have no effect on recreational resources. This alternative would result in a lesser impact than the proposed project.

**Transportation and Traffic:** The No-Project/No-Build Alternative would not result in any adverse environmental effects with respect to transportation and circulation because no additional vehicle trips would be generated. Furthermore, there would be no potential hazards to navigation created from use of barges in the Sacramento River. There would be no change from existing conditions. This alternative would result in a lesser impact than the proposed project.

**Utilities and Service Systems:** The No-Project/No-Build Alternative would not result in potential damage to public utility infrastructure or water supply and drainage facilities. The No-Project/No-Build Alternative would have no effect on utilities and service systems. This alternative would result in a lesser impact than the proposed project.

**Water Quality and Groundwater Resources:** The No-Project/No-Build Alternative would have no water quality impacts associated with construction runoff, dewatering operations, slurry wall material, or borrow material. There would be no effects on groundwater levels resulting from slurry wall cutoffs, disruption of local drainage systems by seepage or stability berms, or other hydrologic impacts. This alternative would result in a lesser impact than the proposed project.

### 7.3.3 No-Action/Federal Project Alternative

The No-Action/Federal Project Alternative includes many of the elements of the proposed project but is substantially greater in magnitude and covers a substantially greater area. It is possible that these differences in project design could be significantly narrowed if not eliminated by USACE as their project engineering and design effort unfolds. However, due to the potentially larger footprint, potential impacts are generally greater under the No-Action/Federal Project Alternative compared to the proposed project based on the increased footprint and magnitude of this alternative.
Aesthetics: The No-Action/Federal Project Alternative would result in greater impacts to aesthetics from increased vegetation loss. More extensive construction activities would impact and disrupt the existing visual conditions in the American River Parkway and along the Sacramento River. This alternative would result in a greater impact than the proposed project.

Agriculture and Forestry Resources: The No-Action/Federal Project Alternative would require the acquisition of properties for flood control easements along the Sacramento River and Arcade Creek. This alternative would also require conversion of agricultural lands to floodway. Because of the increased footprint of this alternative, it could also result in an increased conversion of non-forest land to nonforest uses. This alternative would result in a greater impact than the proposed project.

Air Quality: The No-Action/Federal Project Alternative would require additional construction work resulting in impacts from additional construction equipment, haul trucks, and barges. This alternative would result in a greater impact than the proposed project.

Biological Resources – Fisheries: The No-Action/Federal Project Alternative would result in increased impacts to fish habitat from the removal of vegetation along the levee slopes. The placement of rock along the bank protection sites would cause an increase in turbidity. Widening the Sacramento Bypass would create additional floodplain habitat for fish which could provide a benefit. Overall, this alternative would result in a greater impact than the proposed project.

Biological Resources – Terrestrial: The No-Action/Federal Project Alternative would include construction of levee improvements would result in significant loss of wildlife habitat on the Sacramento River levees, in the American River Parkway, and along Arcade Creek. The Sacramento Weir expansion would require the removal of riparian vegetation. This alternative would result in a greater impact than the proposed project.

Cultural Resources: The No-Action/Federal Project Alternative would result in adverse effects to historic properties from construction of levee improvements and the bypass widening impacts associated with archaeological resources would be greater than those described for the proposed project because the proposed project site does not include the Sacramento Weir or Yolo Bypass. This alternative would result in a greater impact than the proposed project.

Geology, Soils, and Paleontological Resources: The No-Action/Federal Project Alternative would result in greater impacts to geology, soils, and paleontological resources as the footprint of the project is greater in size. This alternative would result in a greater impact than the proposed project.

Geomorphology: The No-Action/Federal Project Alternative would decrease water surface elevations in the Sacramento River channel but water surface elevations in the lower Yolo Bypass would be slightly higher. Although the magnitude of these changes has not been quantified, it is likely that the increase in the Yolo Bypass water surface elevations would be considered “substantial” under the standard historically applied by the CVFPB and thus would constitute a potentially significant and unavoidable impact. This alternative would result in a greater impact than the proposed project.

Greenhouse Gas Emissions: The No-Action/Federal Project Alternative would result in greater impacts to GHG emissions from the use of the additional construction work resulting in impacts from additional construction equipment, haul trucks, and barges. This alternative would result in a greater impact than the proposed project.
**Hazards and Hazardous Materials:** The No-Action/Federal Project Alternative would result in impacts similar to those described for the proposed project from construction activities. Any hazardous materials encountered would be removed and properly disposed of prior to construction. This alternative would result in similar impacts to the proposed project.

**Hydrologic and Hydraulic Resources:** The No-Action/Federal Project Alternative would decrease water surface elevations in the Sacramento River channel but water surface elevations in the lower Yolo Bypass would be slightly higher. Although the magnitude of these changes has not been quantified, it is likely that the increase in the Yolo Bypass water surface elevations would be considered “substantial” under the standard historically applied by the CVFPB and thus would constitute a potentially significant and unavoidable impact. This alternative would result in a greater impact than the proposed project.

**Land Use and Planning, and Population, Housing, and Employment:** The No-Action/Federal Project Alternative would require the acquisition of properties for flood control easements along the Sacramento River and Arcade Creek. This alternative would also require conversion of agricultural lands to floodway. The No-Action/Federal Project Alternative would result in disruption to residents alongside the construction sites from traffic, noise, and dust impacts. Acquisition of properties for flood control easements would be required, which could displace residents. This alternative would result in a greater impact than the proposed project.

**Mineral Resources:** The No-Action/Federal Project Alternative would result in greater impacts to mineral resources as the footprint of the No-Action/Federal Project Alternative is greater in size compared to the proposed project. This alternative would result in a greater impact than the proposed project.

**Noise:** The No-Action/Federal Project Alternative would result in greater noise and vibration impacts to sensitive receptors as a result of the proximity to sensitive receptors from additional construction work resulting in impacts from additional construction equipment, haul trucks, and barges. This alternative would result in a greater impact than the proposed project.

**Recreation Resources:** The No-Action/Federal Project Alternative would result in greater impacts to recreation as a result of temporary closure of recreation facilities for construction in the American River Parkway. Impacts would include temporary closures to bike trails, walking trails, and boat launches/facilities. Other impacts would include possible closure of the Sacramento Bypass during portions of hunting season. This alternative would result in a greater impact than the proposed project.

**Transportation and Traffic:** The No-Action/Federal Project Alternative would result in greater impacts to transportation and traffic as a result of additional construction work associated with this alternative. The resulting impacts from additional construction equipment, haul trucks, and barges would be greater than the proposed project. This alternative would result in a greater impact than the proposed project.

**Utilities and Service Systems:** The No-Action/Federal Project Alternative would result in temporary disruptions to utility services during relocation of utilities that penetrate the levee. This alternative would result in similar impacts to the proposed project.

**Water Quality and Groundwater Resources:** The No-Action/Federal Project Alternative would result in additional potential water quality impacts including increased turbidity during bank protection construction;
runoff of exposed soils; and cement, slurry, or fuel spills during construction. This alternative would result in a greater impact than the proposed project.

7.3.4 **LIMITED FOOTPRINT ALTERNATIVE**

The Limited Footprint Alternative includes many of the elements of the proposed project but is lesser in magnitude. Consequently, potential environmental impacts are generally lesser under the Limited Footprint Alternative compared to the proposed project based on less construction-related activities under this alternative.

**Aesthetics:** Implementation of the Limited Footprint Alternative would result in fewer impacts to aesthetics from vegetation loss. Construction activities would impact and disrupt the existing visual conditions in the American River Parkway and along the Sacramento River but to a lesser extent than the proposed project. This alternative would result in a lesser impact than the proposed project.

**Agriculture and Forestry Resources:** The Limited Footprint Alternative would require the acquisition of properties for flood control easements along the Sacramento River and Arcade Creek. This alternative would result in a lesser impact than the proposed project.

**Air Quality:** The Limited Footprint Alternative would have less impact associated with air pollutant and/or odorous emissions. There would be less heavy equipment needed to perform the improvements resulting in lower air quality impacts. This alternative would result in a lesser impact than the proposed project.

**Biological Resources – Fisheries:** The Limited Footprint Alternative would result in a smaller impact due to the reduced width of the construction footprint. This alternative would not eliminate all impacts to the aquatic biological resources but would reduce the overall impacts. This alternative would result in a lesser impact than the proposed project.

**Biological Resources – Terrestrial:** The Limited Footprint Alternative would result in a smaller impact due to the reduced width of the construction footprint. This alternative would not eliminate all impacts to the terrestrial biological resources but would reduce the overall impacts. This alternative would result in a lesser impact than the proposed project.

**Cultural Resources:** The Limited Footprint Alternative would still include ground-disturbing activities; the reduced width of the construction footprint would eliminate a portion of the potential impacts to cultural resources. This alternative would result in a lesser impact than the proposed project.

**Geology, Soils, and Paleontological Resources:** The Limited Footprint Alternative would have the same risk of construction-related erosion impacts to proposed levee improvements as that described for the proposed project. The risk of potential damage to proposed levee improvements from seismic activity, settlement or liquefaction, or from construction on unstable soils or expansive soils under this alternative would be the same as that described for the proposed project. Project-related construction activities would occur in the same paleontologically sensitive rock formations as the proposed project, therefore the potential impacts to unique paleontological resources would be similar. This alternative would result in a similar impact as the proposed project.

**Geomorphology:** The Limited Footprint Alternative would result in potential geomorphic impacts similar to those described for the proposed project; although the project footprint would be slightly smaller the same
avoidance and minimization measures would be employed as the proposed project thus the impacts would be similar. This alternative would result in a similar impact as the proposed project.

**Greenhouse Gas Emissions:** The Limited Footprint Alternative would have less impact associated with GHG emissions than the proposed project. There would be less heavy equipment needed to perform the improvements resulting in lower GHG emissions. This alternative would result in a lesser impact than the proposed project.

**Hazards and Hazardous Materials:** The Limited Footprint Alternative would result in a similar risk of exposure of construction workers or the general public to potential release of hazardous materials into the environment because construction activities would occur in the same location as the proposed project. This alternative would result in a similar impact as the proposed project.

**Hydrologic and Hydraulic Resources:** The Limited Footprint Alternative would result in potential hydrologic and hydraulic impacts that would be similar to those described for the proposed project. Although the project footprint would be slightly smaller, the same avoidance and minimization measures would be employed as the proposed project. Thus, the impacts would be similar. This alternative would result in a similar impact as the proposed project.

**Land Use and Planning, and Population, Housing, and Employment:** The Limited Footprint Alternative would result in potential land use and planning impacts that would be similar to those described for the proposed project. The construction-related impacts would be temporary in nature and occur within the existing footprint of the SAFCA levee system. Potential population, housing, and employment impacts would be similar to those described for the proposed project. The construction-related impacts would be temporary in nature and occur within the existing footprint of the SAFCA levee system. This alternative would result in a similar impact as the proposed project.

**Mineral Resources:** Potential mineral resource impacts from the Limited Footprint Alternative would be similar to those described for the proposed project because none of the levee improvement areas are located within a regionally or locally designated important mineral resource extraction zone. This alternative would result in a similar impact as the proposed project.

**Noise:** The Limited Footprint Alternative would result in less truck trips and less heavy equipment being used as a result of the smaller footprint being required for the degrade and rebuild of the levee. Therefore, the overall level of construction noise and vibration generated by this alternative would be less. This alternative would result in a lesser level of impact as compared to the proposed project.

**Recreation:** The Limited Footprint Alternative would result in fewer impacts to recreation as a result of the smaller construction footprint. Impacts would still include temporary closures to bike trails, walking trails, and boat launches/facilities. Other impacts would include possible closure of the Sacramento Bypass during portions of the hunting season. This alternative would result in a lesser impact than the proposed project.

**Transportation and Traffic:** The Limited Footprint Alternative would result in less truck trips and less heavy equipment being used as a result of the smaller footprint being required for the degrade and rebuild of the levee. This alternative would result in a lesser impact than the proposed project.
Utilities and Service Systems: The Limited Footprint Alternative would have impacts related to potential damage of utility infrastructure and disruption of service during construction. This would be similar to the proposed project as a cutoff wall would still be installed to the same depth, only the construction methods would differ. This alternative would result in a similar impact as the proposed project.

Water Quality and Groundwater Resources: The Limited Footprint Alternative would have potential water quality and groundwater impacts similar to those described for the proposed project. Although the project footprint would be slightly smaller, the same avoidance and minimization measures would be employed as the proposed project. This alternative would result in a similar impact as the proposed project.

7.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The State CEQA Guidelines require identification of an environmentally superior alternative. If the no-project alternative is environmentally superior, CEQA requires selection of the “environmentally superior alternative other than the no-project alternative” from among the project and the alternatives evaluated (State CEQA Guidelines CCR Section 15126.6(e)(2)). The environmentally superior alternative is the Limited Footprint Alternative because it would have fewer potential impacts on environmental resource areas than the proposed project and the Federal Project Alternative. The Limited Footprint Alternative has substantially higher costs than the proposed project because of the greater use of DMM construction methods for the cutoff walls. Table 7-2 compares the ability of alternatives to meet project objectives and general environmental impacts of alternatives relative to the proposed project.
<table>
<thead>
<tr>
<th>Alternative</th>
<th>Does the Alternative Achieve Objective 1 (provide adequate protection to meet the requirements for accreditation under the NFIP and for urban-level flood protection under applicable State law)?</th>
<th>Does the Alternative Achieve Objective 2 (protect the natural environment, especially riparian habitat and stream channels suitable for native plants, wildlife habitat, and public recreation)?</th>
<th>Summary Description/Comparison to Proposed Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Project</td>
<td>Yes</td>
<td>Yes</td>
<td>Achieves project objectives in a cost-effective manner.</td>
</tr>
<tr>
<td>Alternative 1</td>
<td>No</td>
<td>No</td>
<td>Fewer direct impacts from construction of flood risk reduction improvements than under proposed project, but redirected regional growth would result.</td>
</tr>
<tr>
<td>No-Project/No-Build Alternative</td>
<td></td>
<td></td>
<td>Sacramento metropolitan area would continue to be at a very high risk of levee failure and subsequent flooding, which would result in significant and unavoidable impacts to essentially all environmental resource topics.</td>
</tr>
<tr>
<td>Alternative 2</td>
<td>Yes</td>
<td>No</td>
<td>Construction of fix-in-place levee remediation measures to address seepage, slope stability, erosion, and overtopping with widened Sacramento Weir and Bypass to divert more flows into the Yolo Bypass. Generally greater environmental impacts from larger size and breadth of this alternative and more exposure to flood risk due to a more extended timeframe for project authorization and implementation.</td>
</tr>
<tr>
<td>No-Action/Federal Project Alternative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternative 3</td>
<td>Yes</td>
<td>Yes</td>
<td>Improvements achieve desired Levee Accreditation requirements.</td>
</tr>
<tr>
<td>Limited Footprint Alternative</td>
<td></td>
<td></td>
<td>Generally fewer direct impacts from construction-related activities because of smaller construction footprint.</td>
</tr>
</tbody>
</table>

Note: NFIP = National Flood Insurance Program
Source: AECOM 2014