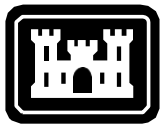
RIVERSIDE LEVEES REHABILITATION PROJECT

RIVERSIDE COUNTY, CALIFORNIA

DRAFT ENVIRONMENTAL ASSESSMENT
&
DRAFT 404B1 ANALYSIS



US Army Corps
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LOS ANGELES DISTRICT

DECEMBER 2021

US Army Corps
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Los Angeles District

Riverside Levees Rehabilitation Project

Draft Environmental Assessment

Contents

1.0 INTRODUCTION

1.1 Proposed Action Area

The Riverside Levees are in Riverside County, California, between the boundaries of the cities of Riverside and Jurupa Valley.

The levees consist of the Right Levee and Left Levee (Right and Left from the perspective of looking downstream). The Right Levee is partially within the city of Riverside and mostly within the city of Jurupa Valley. The Left Levee is completely within the city of Riverside. State Route 60 (SR 60) and two major roadways, Mission Avenue and Market Street, cross the Santa Ana River (SAR) through the area of the proposed project. See Figure 1.

1.2 Study Authority

The repair of Riverside Levees is authorized by Public Law 84-99 (PL 84-99). PL 84-99 amended the Flood Control Act of 1962, authorizing the U.S. Army Corps of Engineers (Corps or USACE) to assist local public works agencies in the repair of both Federal Corps constructed, locally operated and maintained and non-Federal (constructed by a non-Federal interest or by the Work Projects Administration) flood risk management projects damaged by flooding.

1.3 Riverside Levees Background

The Riverside Levees were authorized by the Flood Control Act of 1950 (Public Law 516, 81st Congress). Construction began in 1957 and was completed in 1959.

The purpose of the levee system is to reduce the potential for Santa Ana River flows to break out of the channel and enter adjacent developed areas outside of the levees. The levees range from 15 ft. to 22 ft. in height above the elevation of the riverbed. The riprap apron at the levee toes is 6 ft. high and 12 ft. wide. The levees were designed to convey a flow of approximately 195,000 cubic ft. per second (cfs), exceeding the 100-year flow of 140,000 cfs.

Since 1960, Riverside County Flood Control and Water Conservation District (RCFCWCD) has been responsible for operations and maintenance of the Riverside Levees.

1.3.1 Right Levee

The Right Levee, also referred to as Riverside Levee 1, forms the right bank (looking downstream) of the SAR. The Right Levee starts immediately upstream of Market Street and extends approximately 2.4 miles to approximately 5,000 ft. downstream of the Mission Boulevard Bridge.

1.3.2 Left Levee

The Left Levee, also referred to as Riverside Levee 2, forms the left bank (looking downstream) of the SAR. It is composed of federally and non-federally constructed segments. The federally constructed segment begins approximately 6,276 ft. upstream

of Market Street near the county line and extends 13,780 ft. downstream along the left bank to approximately 500 ft. south of Mission Boulevard.

1.3.3. Groins

Between 1994 and 1996, the RCFCWCD added 31 stone groins to train low flows towards the center of the river. Each groin extends from the lower face of the levee and toe approximately 100 feet toward the low-flow channel. Groins were added the Left Levee from SR 60 to the Riverside County line. Likewise, groins were added to the Right Levee between Mission Boulevard and the SR 60.

1.4 Purpose and Need

From December 2010 to January 2011, multiple storms resulted in substantial flows in the Santa Ana River and flood damage to these levees. Inspections performed by RCFCWCD and USACE in June 2011 identified levee damage including intermittent erosion at the toe of the riverward slope (along approximately 8,300 linear ft. of levee) and the erosion of several groins on both banks of the river. Inspections and subsequent studies concluded that erosion of the levee toe consists of approximately 20,000 cubic yards of rock with another estimated 3,500 cubic yards of rock due to the erosion of several levee groins. In addition to the food damages occurring in 2010 and 2011, floods occurring in previous years have also damaged the levees. Much of the damage occurred due to migration of the low-flow channel against the levee causing erosion along the levee toes.

The segment of river where these damages occurred is designated as critical habitat for the Santa Ana sucker (*Catostomus santaanae*), a Federal Endangered Species Act (ESA) threatened fish species. Critical habitat includes physical or biological features essential to the conservation of the species. The fish is restricted to three noncontiguous populations in three different stream systems in southern California: The lower and middle SAR in San Bernardino, Riverside, and Orange counties; the East, West, and North Forks of the San Gabriel River in Los Angeles County; and lower Big Tujunga Creek, a tributary of the Los Angeles River in Los Angeles County. The proposed action is in the middle reach of the SAR that is within the critical habitat for the fish. Repair activities would require a Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to the Endangered Species Act.

The central element of the critical habitat is the perennial low-flow channel where the fish reside. The fluvial geomorphology of the river is such that the low flows form a braided low-flow channel system which periodically migrate and impinge against the levees. Impingement of perennial low flows slowly weaken the levee toes resulting in notable damages when large storm flows erode the weakened sections. Periodic repairs of damaged sections require relocation of the low-flow channel towards the center of the river, impacting the fish and its habitat.

During initial coordination with the USFWS to discuss repairs, the USFWS emphasized the need to avoid like-for-like repairs. The levees were constructed with ungrouted stones with a launch stone system. Launch stones are stacked immediately adjacent to the riverward face of the levee. In the event a stone from levee toe is washed downstream, gravity would cause launch stones to drop (i.e., “launch”) to fill voids at the

levee toes. According to the USFWS, like-for-like repair of the design described above would result in ongoing periodic impacts to the fish and its habitat which overtime could jeopardize the continued existence the threatened fish.

Based on the above, the purpose is to rehabilitate damaged sections of the Riverside Levees in a manner that would reduce future structural repairs and relocation of the low-flow channel.

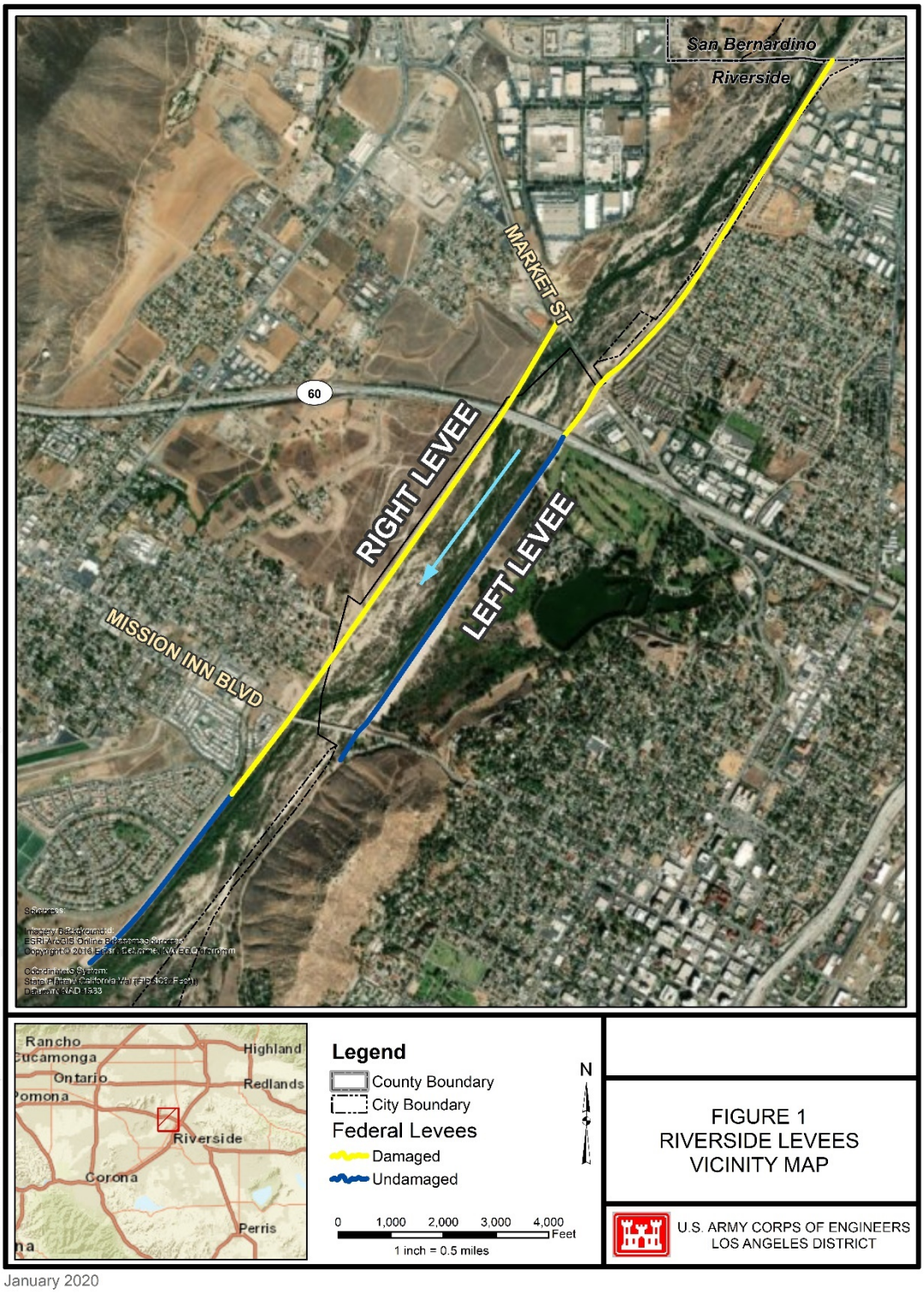


Figure 1. Project Vicinity Map

2.0 ALTERNATIVES

2.1 Project Information Report and Preliminary Array of Designs

As required under the PL 84-99 program, a Project Information Report (PIR) was prepared starting in 2012. The report was approved on September 30, 2019. A PIR consists of a preliminary damage assessment, preliminary repair designs, approximate construction costs, and an evaluation of potential environmental impacts as well as identification of potential environmental or regulatory constraints.

Consistent with requirements of the PL 84-99 program, the 2012 iteration of the PIR focused on like-for-like repairs. That is, the levees and groins would have been repaired to their pre-damage configurations and specifications. Like-for-like repairs would require extensive in-channel construction. Furthermore, the reconstructed structures would continue to remain vulnerable to erosion from large storm flows and impingement of the low-flow channel against the levees. As a result, there would be periodic needs to reconstruct damaged structures. Likewise, there would be periodic disturbance of sensitive species and habitat within the channel. As a result, this alternative was not recommended.

To avoid in-channel construction and minimize disturbance to sensitive species and habitat associated with O&M activities, a floodwall alternative was evaluated. This alternative would construct a highly robust floodwall through the levee prism which would allow the low-flow channel to freely migrate. The construction cost associated with this alternative was deemed to be prohibitive. Furthermore, the benefit to cost ratio was less than one. That is, cost would outweigh benefits. As a result, this alternative was not recommended.

A non-structural alternative that would remove the levees and allow the river to meander in the flood plain was evaluated pursuant to Engineering Regulation (ER) 500-1-1. This alternative was not recommended due to an increase in life safety risk.

In 2013, the array of alternatives was further expanded to include an additional alternative to further strengthen the levee toes against erosion from low-flow channel impingement. The strengthened levee toes would be sufficiently robust to withstand low-flow channel impingement and reduce the need to relocate the low-flow channel away from the levee toes. O&M requirements would be commensurately reduced.

This alternative, also referred to as the “repair and fortify” alternative, was the result of a planning charrette held on 27-28 August 2013 at the USACE Los Angeles District Headquarters in Los Angeles, California. The charrette included attendees from the RCFCWCD, USFWS, USACE staff from the Los Angeles District, South Pacific Division, and USACE Headquarters. The charrette focused on potential impacts to the SAS during construction and O&M activities associated with repair of the damaged levees. This alternative was ultimately recommended by the final PIR for design and implementation.

2.2 Pre-construction Engineering & Design Phase Alternatives

After approval of the PIR, USACE initiated the pre-construction engineering and design (PED) phase of the project. The PED phase focused on various “repair and fortify” designs as recommended by the PIR.

The alternatives development process was centered on evaluation of repair designs. Though the proposed action would be composed of a repair design and revisions to the O&M manual, the latter is dependent on the design selected for implementation. That is, the design dictates the nature of O&M activities.

2.3 PED Alternatives Considered but Not Carried Forward

In 2020, USACE coordinated with RCFCWCD and evaluated several design concepts in accordance with the final PIR's recommendation to determine the design that would strengthen and fortify the toe of the levees. Variants of the design that were evaluated but not carried forward are described below.

2.3.1 Grouted Stone - Overlay atop Existing Grouted Stone

Under this design, the existing grouted stone levees would be left intact in their existing condition. A new grouted stone layer would be placed atop the grouted stone surface. This alternative was not carried forward for further analysis over concerns the overlay could result in voids which could cause cracks in the new grouted stone layer.

2.3.2 Grouted Stone – Remove & Reconstruct with Existing Grouted Stone

Under this design, the existing grouted stone levees would be removed and reconstructed using the existing stones. This alternative was not carried forward for further analysis over concerns that the size and quality of existing stones are unknown. Furthermore, inspection, sorting, and potential import of new stones to replace those deemed unsuitable for reuse would make construction impracticable due to delays and cost increases.

2.3.3 Soil Cement - Remove Existing Grouted Stone

Under this design, the existing grouted stone levees would be removed, and an approximately 10-foot-thick engineered soil cement slope would be constructed in its place. Compared to the existing grouted stone structure, the new soil cement structure would extend approximately 20 ft. deeper to provide additional scour protection. Soils required for the soil cement matrix would be acquired from the riverbed.

This alternative was not carried forward for further analysis for the following reasons. First, soils used for soil cement matrix need to meet certain specifications. Differing soil types within the riverbed could result in construction delays and increase costs. Second, repair and maintenance of soil cement structures would be more difficult than grouted stone structures. Third, the increased thickness of the levees would decrease the width of the channel and affect conveyance capacity. Furthermore, a narrow channel would increase O&M requirements since vegetation would need to be mowed more frequently to maintain conveyance capacity.

2.3.4 Soil Cement - Overlay atop Existing Grouted Stone

Under this design, the existing grouted stone levees would be left intact in their existing condition. An approximately 10-foot-thick engineered soil cement slope would be placed atop the grouted stone surface. Compared to the existing grouted stone structure, the new soil cement structure would extend approximately 20 ft. deeper to provide additional scour protection. Soils required for the soil cement matrix would be acquired from the riverbed.

This alternative was not carried forward for further analysis for the same reasons as the Soil Cement Slope (Overlay atop Existing Grouted Stone) design. Moreover, overlay of soil cement atop the grouted stone surface could result in voids which could cause cracks in the soil cement.

2.3.5 Grouted Stone Toe Extension

Under this design, the existing grouted stone levees would largely be left intact in their existing condition. The toe of the current levee would be further extended 20 ft. with additional grouted stone to provide deeper scour protection.

This alternative was not carried forward for further analysis since potential structural deficiencies within the existing levees would not be corrected. Furthermore, review of as-built plans suggests that the existing grouted stone sizes would be insufficient for the proposed design criteria. Additionally, evaluation of stone sizes and removal of stones that do not meet the design criteria would make construction impracticable resulting in delays and cost increases. Moreover, the ability of the levee to resist erosion from low-flow channel impingement would remain unchanged. Likewise, the frequency and intensity of O&M requirements would remain unchanged.

2.4 Alternatives Carried Forward for Analysis

The PIR evaluated an array of conceptual repair designs: like-for-like, floodwall, nonstructural, and repair and fortify. The repair-and-fortify design was recommended for implementation. In accordance with this recommendation, PED phase evaluated various repair and fortify designs and recommended the Reconstruct with New Grouted Stone design.

Having evaluated a range of alternatives during both the PIR and PED phases, only the Preferred Alternative and the No Action Alternative are carried forward for analysis and implementation.

2.4.1 Preferred Alternative (Reconstruct with New Grouted Stone)

Under this design, the existing ungrouted stones on the riverside faces of the levees will be removed. These stones will be salvaged in other ways to reduce transportation and air quality impacts. Potential uses include but are not limited to armoring for the landside face of the levee to protect against erosion, backfill for the trench that will be excavated during construction, and construction of in-river fish habitat.

The riverside faces of the levees will be constructed with new grouted stones that meet design specifications. Compared to the existing structure, the new grouted stone structure will extend approximately 20 ft. deeper to provide additional scour protection. The thickness of the grouted stone (1.5 to 2 ft. thick) and slope (1 vertical: 2 horizontal) of the levee will remain predominantly unchanged. The only area where levee thickness may differ from existing design is at the Mission Blvd. Bridge crossing where some changes to design of the levee may be required to accommodate a new bridge. With no other change in thickness to the levee, conveyance capacity of the channel will remain unchanged.

Approximately 8,800 linear ft. along the Right Levee and approximately 4,770 ft. along the Left Levee would be repaired. Undamaged intervening sections of the federal levee would not be repaired.

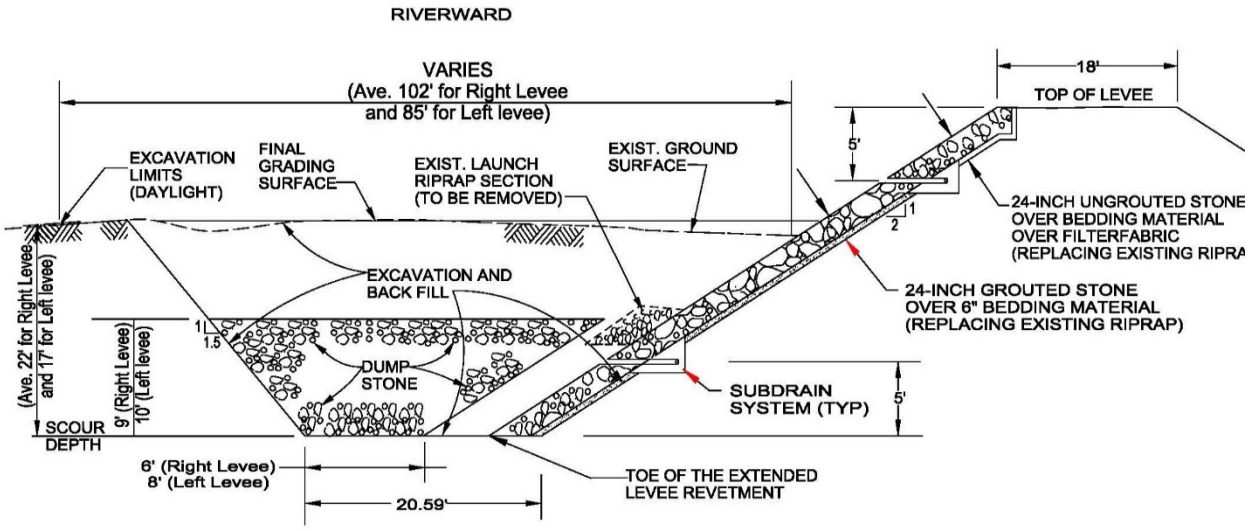


Figure 2. Cross section of the levee repair design.

2.4.2 No Action Alternative

Under the No Action Alternative, the damaged sections of the Riverside Levees would not be repaired. The O&M Manual would not be revised.

2.5 Preferred Alternative (Construction)

Refer to Figure 4 for depiction of elements described for the Preferred Alternative.

2.5.1 Phasing

Construction is currently anticipated to begin in 2022 and continue through 2025. Construction would occur sequentially in two phases. Phase 1 includes rehabilitation of the Right Levee from the downstream terminus near Rancho Jurupa Park.

Phase 2 includes rehabilitation of the Left Levee, including RCPs, the access road on top of the levee, tie-in to the spillway, and underpasses at Market Street and SR-60 bridge crossings.

2.5.2 Duration

Construction is expected to take three years. Each phase will take approximately 18 months to complete. Within each phase, construction will occur in approximately 1,000 ft. segments. There are nine segments on the Right Levee and five segments on the Left Levee.

2.5.3 Temporary Construction Footprint

To facilitate construction, an approximately 150 ft. temporary construction footprint (TCF) will be established extending into the river channel from the toe of levee. An 8 ft.

high temporary wooden sound barrier will be installed along the channel side of the TCF. All construction activities to repair and rehabilitate the levees will occur between the sound barrier and levee toes. An earthen berm will be constructed on the riverside face of the sound barrier. The berm will be protected with plastic sheeting to minimize the possibility for erosion.

All vegetation within the TCF will be removed to facilitate construction and provide enough room for construction equipment to operate. Vegetation will be removed prior to construction, and outside of the bird breeding window (March 15 to September 15).

Within the TCF, a trapezoidal trench will be excavated at various depths ranging from approximately 17 ft. to 30 ft. Construction access roads as well as temporary stockpiling areas will be predominantly located within the TCF, except for two 50 ft. wide construction access roads (extending from the toe of the Riverside Levee 2 into the river channel). These two access roads are necessary to access the northernmost construction areas from the northern staging area.

Outside of the TCF and access roads described above, construction would also occur associated with the establishment of the low-flow diversion channel. Once the low-flow diversion channel is established and functioning, all other construction activities would be confined to within the TCF.

2.5.4 Levee Fortification

Existing 18-inch stones would be removed from the riverside face of the levee to expose the earthen slope. Once the barren slope is recompacted, a filter fabric, a 6-inch-thick bedding layer, and a subdrain system would be installed. A layer of 24-inch stone would be placed atop the bedding layer. The 24-inch stones would be grouted from the toe to 5 ft. below the top of levee.

Excess 18-inch stone would be disposed on-site to the extent practicable. Stone would be used as backfill in the form of dump stone in the construction trench. Excavated soils would also be used as backfill for the trench to the extent practicable. Remaining excess materials (approximately 40,282 cubic yards (cy) of soil) would be disposed at nearby RCFCWCD yards.

2.5.5 Staging and Stockpile Areas

Two landside staging areas will be established for use during construction. The Left Levee Staging Area, adjacent to the Left Levee, is upstream of Riverside Avenue and is approximately 8.9 acres. The Right Levee Staging Area is located at the downstream terminus of the Right Levee, near Rancho Jurupa Park, and is approximately 10 acres in size.

An approximately 6.8-acre lot at the northeast corner of the Mission Blvd./Crestmore Rd. intersection would be used as a temporary stockpile area for excavated soils.

2.5.6 Groin Removal

Overall, the repair-and-fortify design would provide an increased level of protection against erosion at the toe of the levee, reducing the need for periodic incursions into the riverbed and construction impacts within associated with realignment of the low-flow channel. The increased protection against low-flow erosion would allow for the removal

of 18 groins located within the bounds of the Riverside Levees system (12 on the Right Levee, 6 on the Left Levee). Removal would restore approximately two acres of the riverbed.

2.5.7 Channel Access Ramps

Approximately five temporary access ramps would be constructed, three on the Left Levee and two on the Right Levee. All ramps would be constructed from alluvium excavated during construction. Access ramps would be 12 feet with a maximum height of 10 feet with 2:1 slopes (horizontal:vertical).

2.5.8 Engineered Low-flow Diversion Channel and Santa Ana Sucker Habitat.

An existing low-flow channel abutting the levee toe in three separate locations would be diverted into an engineered diversion channel to ensure flows do not enter the TCF during construction. In addition, the diversion channel would provide habitat for the Santa Ana Sucker. The design incorporated recommendations from USACE biologists, ichthyologists specializing in the Santa Ana Sucker, and USFWS biologists.

A trapezoidal, low-flow diversion channel would be excavated in the center of the river. The bottom width would be 30 ft. with 6:1 (horizontal:vertical) slopes. Trapezoidal earthen berms, offset from the excavated channel by approximately five ft., would be constructed atop the riverbed on both sides of the excavated channel, forming a stepped trapezoidal channel. The earthen berms would be 3 ft. wide on top with 3:1 slopes.

Native vegetation will be used to stabilize side slopes, sourced from within the temporary construction footprint (e.g., willow cuttings). If necessary, temporary erosion control measures (e.g., straw waddles, erosion netting, etc.) will be utilized to further protect the slopes during vegetation establishment. In addition to stabilizing slopes, the vegetation will provide shade and aid in the reduction of water temperatures for the Santa Ana Sucker.

Locally sourced rock substrate (boulder, cobble, and gravel) will be purchased for in-stream SAS features and will be placed in the diversion channel to create rock clusters at 200 ft. intervals. Cobble and gravel substrate will be placed in the vicinity of rock clusters to improve channel bottom substrate at these locations. Rock clusters are expected to create scour pools with varying depths and provide additional channel complexity and in-channel cover and concealment for the Santa Ana Sucker.

The diversion channel would be constructed in three separated segments: an approximately 3,050 ft. segment upstream; an approximately 2,440 ft. segment in the middle; and an approximately 2,750 ft. segment downstream. The total length is approximately 8,200 ft.

Once constructed, earthen berms would be placed across the existing low-flow channel to shunt low flows into the diversion channel. After levee rehabilitation, the diversion channels would be left in place. Over time, the diversion channel is expected to meander and migrate in accordance with the river's fluvial geomorphology.

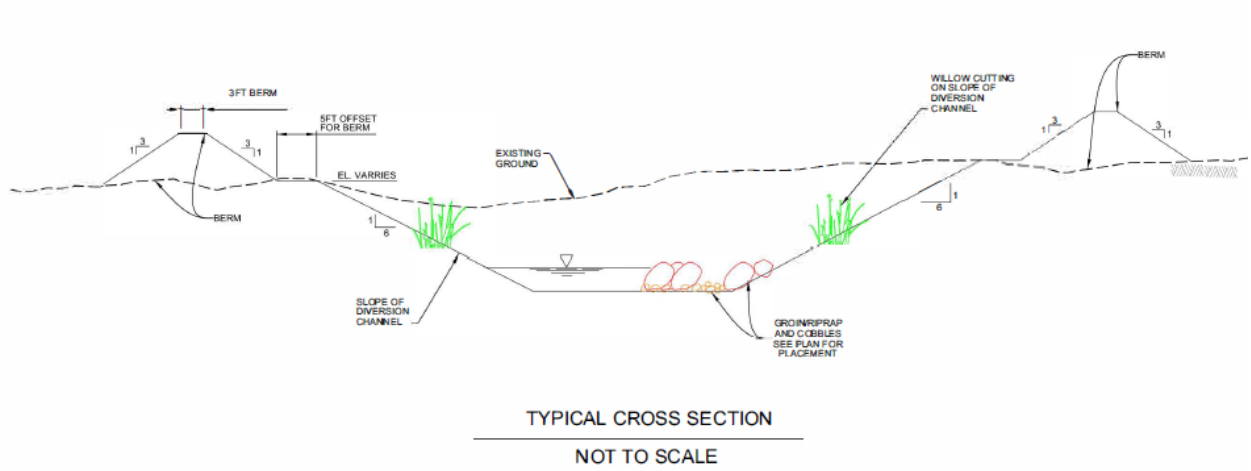


Figure 3. Cross Section of the Low-flow Diversion Channel

2.5.9 Export of Excess Soil

Construction would result in approximately 23,000 cy of excess soil. The excess fill would be hauled to a rock quarry located approximately 5 miles away. Approximately 2,300 truck trips would be required to export the excess soil.

2.5.10 Post-Construction Revegetation

Approximately 60 acres of vegetated riverbed disturbed construction would be revegetated via hydroseed. This effort includes post-construction preparation of soils, hydro-mulching/seeding, planting of woody cuttings, and temporary irrigation. Monitoring and adaptive management will be performed biannually over a period of five years to ensure successful restoration of native riparian vegetation.

2.5.11 Temporary Detour for the Santa Ana River Trail

Refer to Figure 5 for depiction of detours described.

Two temporary detours of the Santa Ana River Trail (SAR Trail), a multi-use trail atop the Left Levee would be required at the following locations:

- **SR 60-Market St.:** Upstream of the SR 60 bridge, the SAR Trail would be shunted to the landside slope of the Left Levee for approximately 430 ft. Two ramps would join the detour to SAR Trail.

- **Market St.-Riverside Dr.:** An existing ramp landside of the Left Levee perpendicular to the terminus of Columbia Ave would divert trail users to a 0.5 mile-long access road adjacent to the levee toe. The road would lead to a ramp located at the confluence of the SAR and Highgrove Channel. From this ramp, trail would be diverted onto an existing recreational trail atop the embankment of Highgrove Channel for approximately 0.3 mile towards a turn-around at Riverside Ave. From this point, the trail would double-back on the opposite embankment back towards SAR-Highgrove Channel Confluence. At this juncture, a ramp would transition the detour back onto the SAR Trail.

Ascending and descending grades for all ramps will not exceed 8%. The temporary detour trails would be approximately 8 ft. wide and paved with 2 in. asphalt concrete over 6 in. aggregate base course. Signage will be posted on both ends of the trail detours to alert approaching trail users to the detours.

The trail detours are projected to take place in 2024 and would last up to a year. The estimated date and duration are subject to change based on progress of construction and environmental factors such as weather and storm flows.

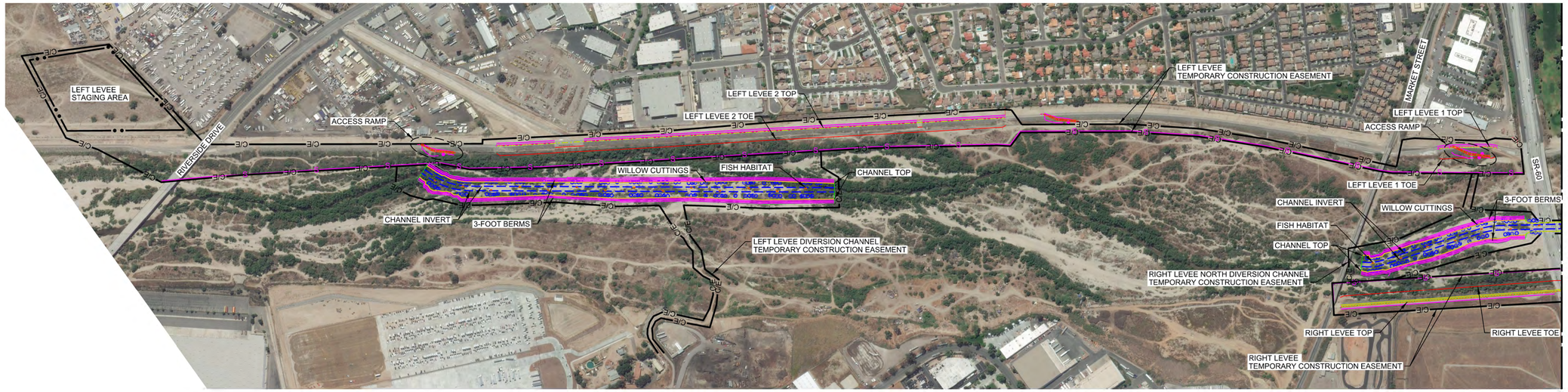
Temporary and periodic disruption of SAR Trail use downstream of Carlson Dog Park is expected starting fall 2022 as construction equipment will access the SAR from this point. The duration of construction at this area is approximately six months. The estimated date and duration are subject to change based on progress of construction and environmental factors such as weather and storm flows.

Construction flaggers would be posted on this segment of the trail near the dog park as well as upstream of Riverside Ave. bridge during hours of construction to alert approaching trail users and direct traffic.

2.5.12 Temporary Operating Hours Reduction at Carlson Dog Park

Construction of the Low-flow Diversion Channel at the downstream terminus of the Right Levee would require use of the access road (Scout Ln.) and parking area at Carlson Dog Park for construction access. For safety purposes, the park would be temporarily closed during hours of construction from Monday through Friday. The park would be available for use in the early morning or early evening. The temporary reduction in operating hours would start in fall 2022 and would last for approximately six months. Historical features adjacent to the haul route would be protected in place with concrete barriers.

Coordination with the City of Riverside, Riverside County Regional Park and Open-Space District, and the San Bernardino County Regional Parks Department is underway. Once agency coordination is complete and stipulations for use are specified, the temporary operating hours will be posted at the park via signage.



MATCH LINE SEE DETAIL A1

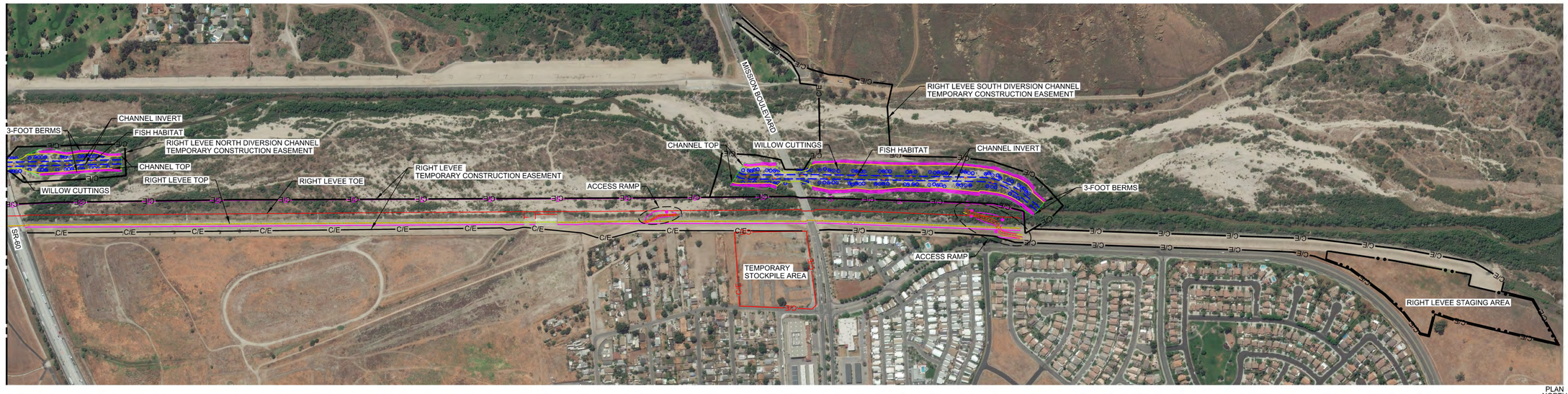
PLAN NORTH

TRUE N

E1 REPAIRS NORTH OF SR-60

SCALE: 1" = 400'

0 400' 800'



PLAN NORTH

TRUE N

A1 REPAIRS SOUTH OF SR-60

SCALE: 1" = 400'

0 400' 800'

Figure 4: Plan View of Construction Elements

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DATE | DESCRIPTION | MARK

SIZE ANSI B | CAD FILE: 475912- PROJECT MASTER MODEL.dgn

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
LOS ANGELES, CALIFORNIA

RIVERSIDE COUNTY, CALIFO
SANTA ANA RIVER BASIN
RIVERSIDE LEVEES REHABILITATION

LEVEE REPAIRS
PROJECT MAP

PLATE ID

1

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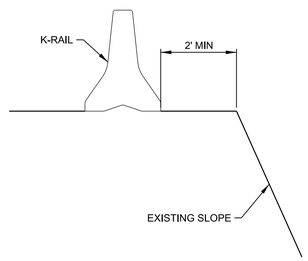
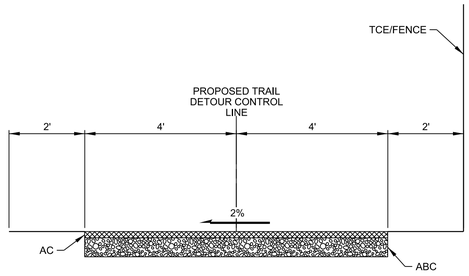


L1 K-RAIL ON LEVEE
SCALE: N.T.S.



L5 TRAIL DETOUR TYPICAL SECTION
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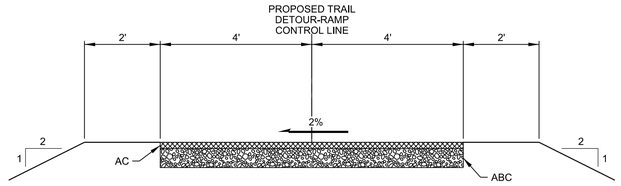


L11 TYPICAL TRAIL DETOUR-RAMP
SCALE: N.T.S.

G1 PHASE ONE PLAN
SCALE: N.T.S.

B1 PHASE TWO PLAN
SCALE: 1" = 50'

GENERAL NOTES

1. TEMPORARY TRAIL DESIGN MUST CONFORM TO STANDARDS WITHIN THE CA HIGHWAY DESIGN MANUAL CHAPTER 1000
2. ACCESS CONTROL SHOULD BE MAINTAINED AND/OR IMPROVED ON THE TRAIL DETOUR SECTIONS (BOLLARDS, ETC.)
3. K-RAIL MUST BE SECURED IN PLACE.
4. TRAIL SIGNAGE AND MARKINGS MUST ADHERE TO CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, CALIFORNIA HIGHWAY DESIGN MANUAL, AND SANTA ANA RIVER PARKWAY MINIMUM TRAIL SIGNAGE GUIDELINES.
5. SLOPES ADJACENT TO THE TRAIL DETOUR SHOULD BE TREATED TO PREVENT RUNOFF & SEDIMENT FLOW ONTO THE TRAIL.

EXIHIBIT NOTES

PHASE ONE:
1. PROVIDE FLAG MAN WHERE TRAIL AND CONSTRUCTION INTERSECT.
2. CONTRACTOR MUST KEEP DOG PARK, PARKING LOT AND AN ACCESS ROUTE FOR THE SANTA ANA RIVER TRAIL ACCESSIBLE TO THE COMMUNITY AND IN SAFE CONDITION FROM 5 A.M. TO 10 A.M. AND 4 P.M. TO 10 P.M. ON MONDAY - FRIDAY, AND FROM 5 A.M. UNTIL 10 P.M. ON SATURDAY AND SUNDAY.
3. CONTRACTOR MUST CONTACT THE CITY OF RIVERSIDE PARK SUPERINTENDENT AT (951) 826-2000 FOR A PRE-CONSTRUCTION WALK-THROUGH TO DOCUMENTEXISTING CONDITIONS PRIOR TO BEGINNING WORK.
4. CONTRACTOR MUST CONTACT THE CITY OF RIVERSIDE PARK SUPERINTENDENT AT (951) 826-2000 FOR A FINAL WALK-THROUGH TO PRIOR TO PROJECT CLOSE-OUT. CONTRACTOR MUST MAKE REPAIRS TO ANY INCIDENTAL DAMAGE TO PARK IMPROVEMENTS, LEAVING THE PARK IN AS GOOD OR BETTER CONDITION.
5. CONTRACTOR MUST ENTER INTO A RIGHT OF ENTRY AGREEMENT WITH THE CITY, COMPLY WITH ALL TERMS AND CONDITIONS, AND PROVIDE COMPENSATION, ALL AS OUTLINED IN THE RIGHT OF ENTRY AGREEMENT.

PHASE TWO:
1. PROVIDE BIDIRECTIONAL TRAIL DETOUR PLAN FOR A 430-FT LEFT LEVEE ON LANDSIDE OF LEFT LEVEE REPAIR SECTION.
2. RAMP CROSS SECTION MUST CONFORM TO DETAIL L11.
3. ALL OTHER TRAIL DETOUR CROSS SECTIONS MUST CONFORM TO DETAIL L5.
4. K-RAIL ON LEVEE MUST PLACED PER DETAIL L1.

SHEET NOTES:
1. RAMP MAXIMUM ASCENDING/DECENDING GRADE OF 8%.
2. TRAIL PAVING TO BE 2" ASPHALT CONCRETE (AC) OVER 6" AGGREGATE BASE COURSE (ABC).

LEGEND

PROPOSED TRAIL DETOUR CONTROL LINE

K-RAIL

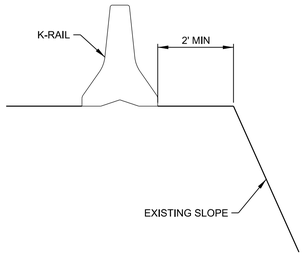
PROPOSED FLAG MAN LOCATION

THIS EXHIBIT IS FOR INFORMATION PURPOSE ONLY, NOT INTENDED FOR CONSTRUCTION.

US Army Corps of Engineers®

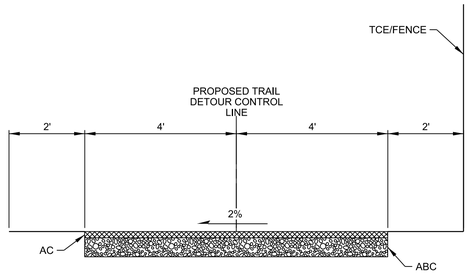
RIVERSIDE LEVEE
CONCEPTUAL TRAIL DETOUR
SHEET 1 OF 2

EXHIBIT ID
EX. 1



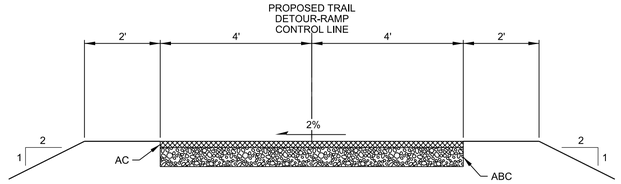
L1 K-RAIL ON LEVEE TYPICAL SECTION

SCALE: N.T.S.



L5 TRAIL DETOUR TYPICAL SECTION

SCALE: N.T.S.



L11 TRAIL DETOUR-RAMP TYPICAL SECION

SCALE: N.T.S.

GENERAL NOTES

1. TEMPORARY TRAIL DESIGN MUST CONFORM TO STANDARDS WITHIN THE CA HIGHWAY DESIGN MANUAL CHAPTER 1000
2. ACCESS CONTROL SHOULD BE MAINTAINED AND/OR IMPROVED ON THE TRAIL DETOUR SECTIONS (BOLLARDS, ETC.)
3. K-RAIL MUST BE SECURED IN PLACE.
4. TRAIL SIGNAGE AND MARKINGS MUST ADHERE TO CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, CALIFORNIA HIGHWAY DESIGN MANUAL, AND SANTA ANA RIVER PARKWAY MINIMUM TRAIL SIGNAGE GUIDELINES.
5. SLOPES ADJACENT TO THE TRAIL DETOUR SHOULD BE TREATED TO PREVENT RUNOFF & SEDIMENT FLOW ONTO THE TRAIL.

EXIHIBIT NOTES

PHASE THREE:
1. PROVIDE BIDIRECTIONAL TRAIL DETOUR PLAN FOR A 430-FT LEFT LEVEE ON LANDSIDE OF LEFT LEVEE REPAIR SECTION.
2. RAMP CROSS SECTION MUST CONFORM TO DETAIL L11.
3. ALL OTHER TRAIL DETOUR CROSS SECTIONS MUST CONFORM TO DETAIL L5.
4. K-RAIL PARRELL ON LEVEE MUST BE PLACED PER DETAIL L1.
5. PROVIDE FLAG MAN WHERE TRAIL AND CONSTRUCTION TRAFFIC INTERSECT.

SHEET NOTES:
1. RAMP MAXIMUM ASCENDING/DECENDING GRADE OF 8%.
2. TRAIL PAVING TO BE 2" ASPHALT CONCRETE (AC) OVER 6" AGGREGATE BASE COURSE (ABC).

LEGEND

PROPOSED TRAIL DETOUR CONTROL LINE

K-RAIL

EXISTING TRAIL CONTROL LINE

PROPOSED FLAG MAN LOCATION

G1 PHASE THREE PART 2 PLAN

SCALE: 1" = 200'

0 2000' 4000'

B1 PHASE THREE PART 1 PLAN

SCALE: 1" = 200'

0 2000' 4000'

Figure 5: Plan view of temporary Santa Ana River Trail diversions

US Army Corps of Engineers®

RIVERSIDE LEVEE
CONCEPTUAL TRAIL DETOUR
SHEET 2 OF 2

EXHIBIT ID

EX. 2

THIS EXHIBIT IS FOR INFORMATION PURPOSE ONLY, NOT INTENDED FOR CONSTRUCTION.

2.6 Preferred Alternative (Operations and Maintenance)

Rehabilitation of the Riverside Levees would also be accompanied by a revised O&M Manual to codify O&M practices which have changed notably from those prescribed in the 1960 O&M manual. The revised O&M manual would describe most of the existing O&M practices and would be updated to reflect current USACE maintenance guidelines, and USFWS recommendations.

The fortified levees would reduce potential for structural damages from storm flows. Thus, a decrease in the frequency of structural repairs requiring in-channel work and repairs including relocation of the low-flow channel is expected in the rehabilitated sections.

The updated O&M Manual would be applicable to the entirety of the federally constructed Riverside Levees. This includes repaired and un-repaired sections as well as grouted and ungrouted riprap sections.

2.6.1 Current Operations and Maintenance Practices

The Operations and Maintenance (O&M) Manual for Riverside Levees was completed in February 1960. The 1960 O&M Manual required the riverbed to be kept clear of "debris, weeds, and wild growth". Although the O&M Manual did not further elaborate on what constitutes weeds and wild growth, it is likely that these terms refer to all vegetation. Thus, in the first few decades after completion of construction, RCFCWCD likely kept the channel clear of all vegetation. The channel likely supported sparse vegetation as appropriate for the ephemeral flow regime for decades after construction. Riparian corridors with robust vegetation emerged after construction of wastewater treatment plants upstream which resulted in discharge of treated water forming a perennial low-flow channel.

Current O&M practices have been modified to adapt to environmental laws and regulations promulgated to protect water quality and wildlife subsequent to completion of the 1960 O&M Manual. RCFCWCD annual maintenance activities occur along the river bottom between the toes of levees. O&M activities include mowing, trash removal, and invasive species removal. The annual maintenance activities are coordinated with California Department of Fish and Wildlife (CDFW) and the USFWS.

Maintenance activities are typically conducted each year outside of the riparian nesting bird season (March 15 to September 15). Mowing is conducted in a manner that does not disturb the root system. The acreage and location of mowing areas vary annually and are primarily determined by the following criteria: alternating mowing areas to allow for vegetation regrowth, avoiding the low-flow channel by a minimum of 20 ft. from the bank, avoiding areas with sparse vegetation, and avoiding areas occupied by Santa Ana River Woolly-star (*Eriastrum densifolium* subsp. Sanctorum; SAWS). Avoiding the 20-foot buffer along the low-flow channel allows for preservation of the mature riparian habitat. This habitat supports the breeding requirements of Least Bell's Vireo (*Vireo belli pusillus*; LBV) and other nesting avian species, as well as providing shade and preserving habitat for Santa Ana Sucker (*Catostomus santaanae*; SAS). Maintaining this exclusion zone near the low-flow channel also avoids any potential impacts to SAS.

Surveys for the SAWS are completed annually prior to mowing activities, in accordance with USFWS/CDFW protocols, to ensure SAWS populations are avoided.

Mowing is also conducted in a manner that would not result in a discharge of dredged or fill material that would require Section 404 or Section 401 authorizations pursuant to the Clean Water Act (CWA).

However, RCFCWCD periodically does secure Section 404 and 401 permits from USACE and the Santa Ana Regional Water Quality Control Board, respectively, when maintenance activities are expected to result in discharges of fill in waters of the United States. These less frequent maintenance activities are usually associated with structural repair of the levees or groins due to erosion caused by storm flows or the low-flow channel impinging against the toe of levees. Fill is also discharged to divert the low-flow channel away from repair areas. The repairs are usually conducted under emergency circumstances. Thus, most emergency structural repairs are conducted under Regional General Permit 63, a regional general permit for use in emergency repairs. Some repairs are conducted under Nationwide Permits 3 or 31.

Structural repairs resulting in discharges of fill in waters of the US often require some deviation from the annual maintenance practices which are designed to avoid impacts to species and habitat protected under the ESA. Emergency repairs may need to be undertaken within the nesting season or require relocation of the low-flow channel. Even though species avoidance and minimization measures are incorporated into these activities, they may affect the SAWS, LBV, and the SAS, respectively. For activities authorized under RGP 63, the USFWS may provide project-specific recommendations to avoid or minimize potential take of listed species or adverse modification of designated critical habitat. USACE would determine which recommendations would be incorporated into the emergency authorization. For activities authorized under Nationwide Permits or Standard Individual Permits, USACE consults with USFWS on a project-specific basis pursuant to Section 7 of the ESA.

In summary, annual maintenance activities are conducted in such a way as to avoid discharges of fill in waters of US and to avoid adverse impacts to species protected under the ESA. There are no long-term programmatic Section 404 CWA, Section 401 CWA, or Section 7 ESA authorizations for the annual maintenance activities.

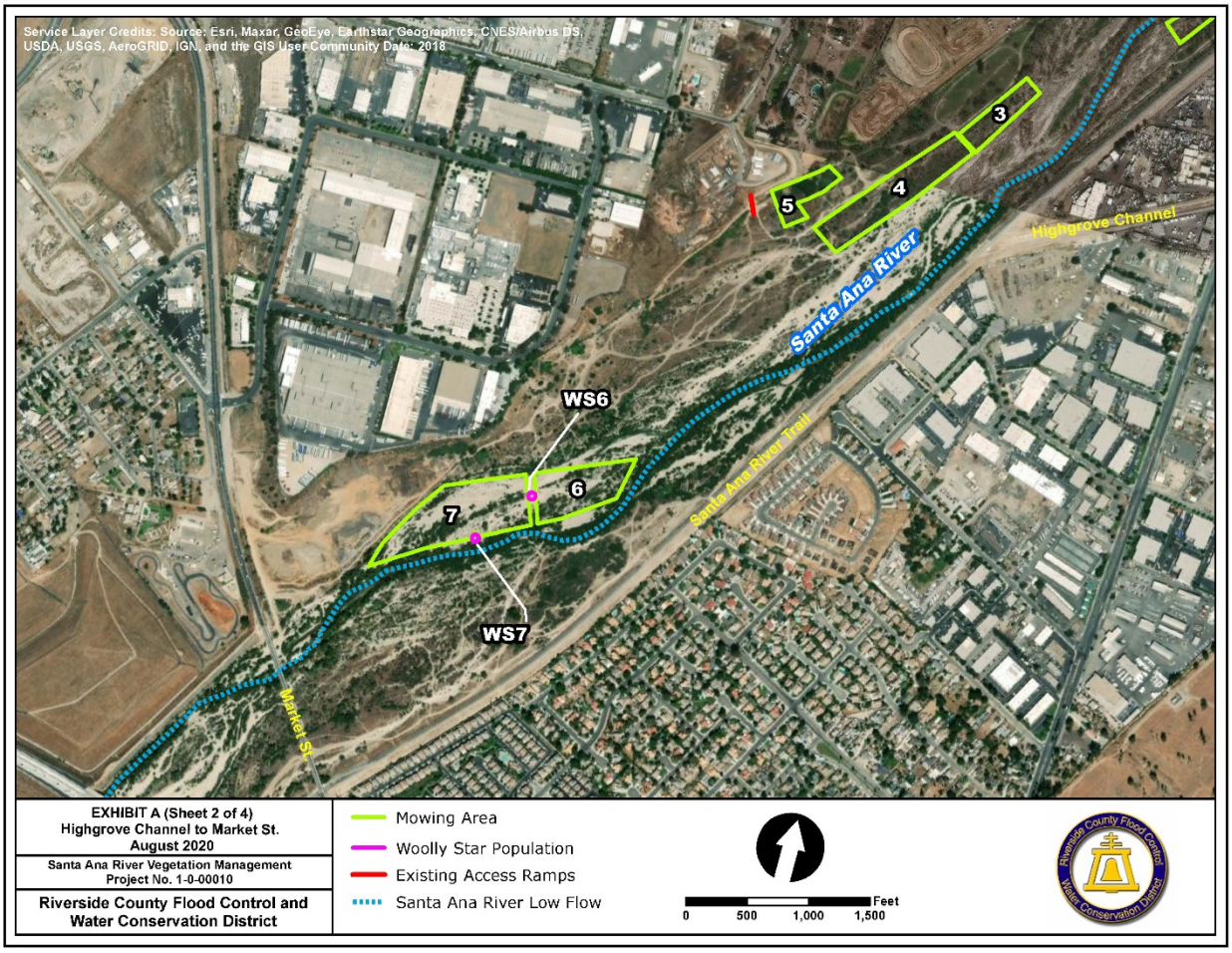


Figure 6. Plan view of current O&M practices with rotational mowing.

2.6.2 Anticipated Future Operations and Maintenance Practices

2.6.2.1 Vegetation Management

Levee fortification would reduce the potential for erosion of rehabilitated levees. Likewise, the vegetation management regime would be reduced. The updated O&M Manual would implement the following vegetation management measures:

- Mowing would be rotated through the channel so that no specific area is mowed more frequently than once every two years. Mowing areas would be identified, and the extent of mowing would be adjusted annually based on the amount of vegetative growth that could affect hydraulic capacity. Thus, mowing areas and acreages would vary from year to year and are not expected to follow a specific pattern. (Figure 5).

- Specifically, sufficient vegetation would need to be removed to maintain a Manning's roughness n value of 0.045. Extent of annual mowing of would be commensurate with the extent of in-channel vegetation and coordination with wildlife regulatory agencies. Mowing acreage would be adjusted to maintain a composite n-value of 0.045.

- Vegetation within 20 ft. of the bank on either side of the low-flow channel would be avoided during mowing activities.
- A 15-ft vegetation free zone (VFZ) along the toe of the levees would be maintained pursuant to USACE Engineering Technical Letter 1110-2-571 (see Figure 6).
- Should the low-flow channel and the associated 20 ft. vegetation buffer encroach upon the levees, vegetation within the VFZ will not require removal if levee inspections find that levee functions would be not compromised and there would no unacceptable safety risk (USACE, 2017; USACE 2019). If adequate inspections cannot be performed, the amount of vegetation to be removed within the VFZ will be minimized to the extent practicable to facilitate an adequate inspection of the levees to determine their functionality.
- Continued coordination with regulatory wildlife agencies to adaptively manage operations to avoid and minimize impacts to sensitive resources and species.

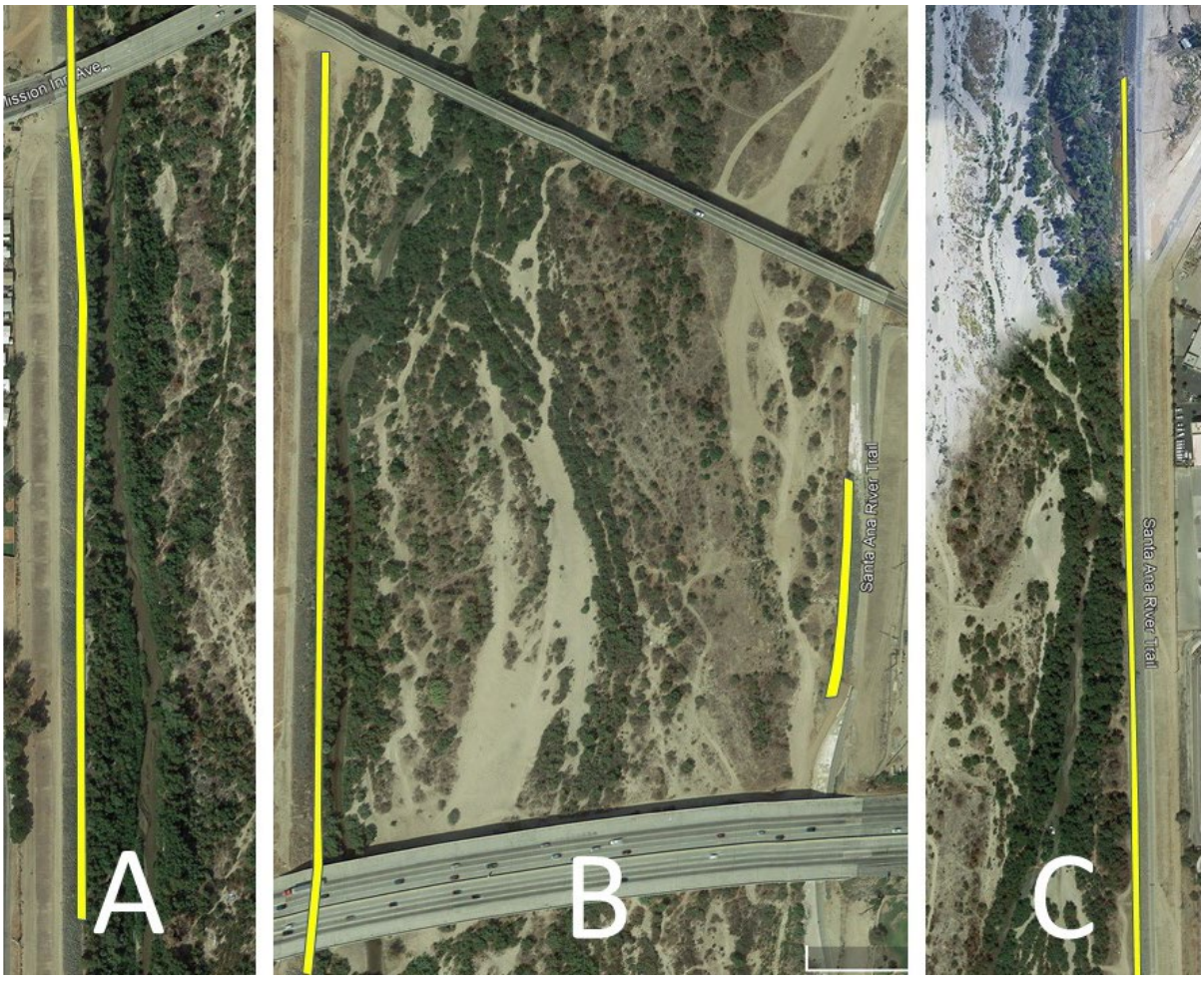


Figure 7. Examples of 15-foot Vegetation Free Zone (VFZ) and proximity to current low-flow channel indicated by yellow lines. A) Right Levee south of Mission Blvd. bridge, B) Right and Left levees between Hwy 60 and Market St., and C) Left Levee south of Riverside Dr.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Air Quality

3.1.1 Affected Environment

South Coast Air Basin

The project area is within the South Coast Air Basin (SCAB) which includes the portions of Los Angeles, Orange, Riverside, and San Bernardino Counties that are non-desert. Air quality within the project area is governed by the South Coast Air Quality Management District (SCAQMD).

National Ambient Air Quality Standards

The Clean Air Act identified and established the National Ambient Air Quality Standards (NAAQS) for several criteria pollutants to protect the public health and welfare. The criteria pollutants include ozone (O3), carbon monoxide (CO), suspended particulate matter (PM), sulfur dioxide (SO2), nitrogen dioxide (NO2), and lead (Pb). PM emissions are regulated in two size classes: Particulates up to 10 microns in diameter (PM10) and particulates up to 2.5 microns in diameter (PM2.5).

A region is given the status of “attainment” or “unclassified” if the NAAQS have not been exceeded. A status of "nonattainment" for particular criteria pollutants is assigned if the NAAQS have been exceeded. Once designated as nonattainment, attainment status may be achieved after three years of data showing non-exceedance of the standard. When an area is reclassified from nonattainment to attainment, it is designated as a “maintenance area,” indicating the requirement to establish and enforce a plan to maintain attainment of the standard.

General Conformity Rule

Section 176(c) of the federal Clean Air Act states that a federal agency cannot issue a permit for, or support an activity within a nonattainment or maintenance area unless the agency determines it will conform to the most recent U.S. Environmental Protection Agency-approved State Implementation Plan. Thus, a federal action must not:

- Cause or contribute to any new violation of a NAAQS.
- Increase the frequency or severity of any existing violation.
- Delay the timely attainment of any standard, interim emission reduction, or other milestone.

A conformity determination is required for each criteria pollutant or precursor where the total of direct and indirect emissions of the criteria pollutant or precursor in a nonattainment or maintenance area caused by the federal action would equal or exceed the General Conformity applicability rates specified in 40 C.F.R. section 93.153.

Attainment designations and the applicable General Conformity Rates are shown below.

Table 1. NAAQS Attainment Designations for the South Coast Air Basin (SACB) and General Conformity Applicability Rates

Pollutant	NAAQS Attainment Designation	General Conformity Applicability Rates (tons/year)
Ozone (VOC as precursor)*	Nonattainment (Extreme)	10
Ozone (NOx as precursor)*	Nonattainment (Extreme)	10
Carbon Monoxide (CO)	Attainment (Maintenance)	100
Nitrogen Dioxide (NO2)	Attainment (Maintenance)	100
Particulate Matter (PM10)	Attainment (Maintenance)	100
Particulate Matter (PM2.5)*	Nonattainment (Serious)	70
Lead (Pb)	Attainment	25
Sources: 40 CFR 93.53(b)(1) and 40 CFR 93.53(b)(2) VOC = Volatile Organic Chemical * non-attainment pollutants assessed for compliance with General Conformity Rules		

Greenhouse Gases

Gases that trap heat in the atmosphere are often called greenhouse gases (GHG). GHGs are emitted by natural processes and human activities. Examples of GHGs that are produced both by natural processes and industry include carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O).

There are currently no Federal GHG emission thresholds. Therefore, a GHG significance threshold to assess impacts is not proposed. Rather, in compliance with NEPA implementing regulations, the anticipated emissions are disclosed for each alternative without expressing a judgment as to their significance.

Emission Estimates Methodology

Emissions were estimated using CalEEMod.2020.4.0 emission modeling software, the California Air Resources Board-approved emissions modeling software used by all air districts in California.

Estimates of lead emissions were not calculated. Lead emissions from mobile sources in California have significantly decreased due to the near elimination of lead in fuels. Little to no quantifiable and foreseeable lead emissions would be generated by any of the alternatives. Thus, CalEEMod.2020.4.0 does not calculate lead emissions.

Ozone (O_3) formation is driven by two major classes of directly emitted precursors: nitrogen oxides (NO_x) and volatile organic compounds (VOC). The relation between ozone, NO_x and VOC is driven by complex nonlinear photochemistry. Thus, ozone formation is variable, dependent on temperature and solar flux.

Ozone formation is not only variable but also regional. Ozone forms from NO_x and VOC emission from all emission sources within a given air basin. Thus, it is not possible to distinguish the amount of ozone formed due to construction emissions relative to the larger amount of ozone present in an air basin.

Due to the above, CalEEMod.2020.4.0 does not provide estimates for ozone. Instead, the emission estimates for VOC and NO_x are used as a surrogate for reporting ozone emissions per the General Conformity Applicability Rates. Since the consumption of VOC or NO_x in ozone formation reaction is variable, actual ozone levels are lower than those reported.

General Conformity Rule makes a distinction between NO_x as an ozone precursor and NO_2 for reporting purposes. CalEEMod.2020.4.0 has emission factors for NO_x but not for NO_2. Because NO_2, a form of NO_x, forms the majority of NO_x emission from internal combustion engines, estimated emissions of NO_x are used as a surrogate for NO_2 emissions.

Additional details on methodology and assumption are documented in Appendix A.

3.1.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative:

- Exceeds General Conformity Applicability Rates

Preferred Alternative (Construction)

Off-road emissions would include those from four excavators, three loaders, and three bulldozers operating eight hours per day, five days a week from Monday through Friday. The duration of the work would be three years with approximately 261 working days per year.

On-road emissions would include those from approximately 9,843 truck trips to import stones and grout. Round trip distance to nearest rock quarry is 30 miles. On-road emissions would also include 10 construction worker commutes at 30 miles per round trip. Export of excess soil would require approximately 2,300 truck trips.

As shown in Table 2 estimated annual emissions would not exceed the General Conformity applicability thresholds. Impacts would be less than significant.

Table 2. General Conformity Applicability Rates and Estimated Annual Emissions (Construction)

Pollutant	General Conformity Applicability Rates (tons/year)	2022 (tons/year)	2023 (tons/year)	2024 (tons/year)
Ozone (VOC as precursor)*	10	0.88	0.82	0.39
Ozone (NO_x as precursor)*	10	8.48	7.44	3.43
Carbon Monoxide (CO)	100	7.09	6.99	3.47
Nitrogen Dioxide (NO_2)	100	8.48	7.44	3.43
Particulate Matter (PM_{10})	100	0.34	0.30	0.14
Particulate Matter ($PM_{2.5}$)*	100	0.31	0.27	0.12
Lead (Pb)	25	n/a	n/a	n/a
* non-attainment pollutants assessed for compliance with General Conformity Rules				

Preferred Alternative (Operations and Maintenance)

O&M activities entail annual vegetation maintenance. Off-road emissions would include those from six skid-steer, rubber-tracked mowers and one excavator. The duration of the work would be approximately eight hours per day over 20 days. On-road emissions would include those from three dump trucks and two water trucks. Each truck would travel approximately four miles per day.

Periodically, large storms may cause structural damages requiring emergency repairs. Storm damage repairs typically require two excavators, two bulldozers, and two loaders operating eight hours over 30 days. On-road emissions would include those from four dump trucks. Each truck would travel approximately four miles per day. On-road vehicles include heavy duty trucks for importing stone and grout. This activity occurs on an as-needed basis. However, for the purpose of quantifying annual emissions, this activity is assumed to occur once per year.

As shown in Table 3 estimated annual emissions would not exceed the General Conformity applicability thresholds. Impacts would be less than significant.

Table 3. General Conformity Applicability Rates and Estimated Annual Emissions (O&M)

Pollutant	General Conformity Applicability Rates (tons/year)	Vegetation Maintenance (tons/year)	Structural Maintenance (tons/year)
Ozone (VOC as precursor)*	10	0.01	0.81
Ozone (NO_x as precursor)*	10	0.10	7.29
Carbon Monoxide (CO)	100	0.12	4.6
Nitrogen Dioxide (NO_2)	100	0.10	7.29
Particulate Matter (PM_{10})	100	0.0039	0.29
Particulate Matter ($PM_{2.5}$)*	75	0.0032	0.27
Lead (Pb)	25	n/a	
* non-attainment pollutants assessed for compliance with General Conformity Rules			

Table 4. Estimated Greenhouse Gases Emissions

Pollutant	(tons/year)
Construction Year 2022	1,812
Construction Year 2023	1,802
Construction Year 2024	900
Operations (Vegetation Maintenance)	17
Operations (Structural Maintenance)	1,321

General Conformity Rule Compliance

As shown above, estimated annual emissions for both construction and O&M would not exceed the Clean Air Act General Conformity applicability rates for ozone and $PM_{2.5}$. As a result, a General Conformity Analysis would not be required.

3.2 Biological Resources

3.2.1 Affected Environment

The biological environment for the Santa Ana River within the project area consists of various successional stages of riverine habitat composed of cottonwood/willow woodland (< 60% canopy closure), expanses of sand bars, riparian shrub and scrub, open water, and non-native invasive habitats. Habitat in the project area is subject to frequent changes due to variable flow conditions, including periods of low and high flow, that continuously work to redistribute successional stages and habitat features within the river corridor. Intermittent maintenance of existing flood risk reduction features within the channel also periodically disrupts habitat and associated plant and animal species. Habitats within the Santa Ana River support diverse assemblages of wildlife and provide access to water, shade, and cover. Relatively disturbed areas that are adjacent to existing riparian vegetation can be important to a suite of common and sensitive wildlife.

Vegetation

Approximately 374 acres of the riverbed within the general area bounded by Rancho Jurupa Park at the downstream terminus and Riverside Ave at the upstream teminus is vegetated with riparian vegetation. An approximately 18.4-acre subset of the riparian vegetation near the low-flow channel in combination with hydric soils, and perennial low-flows are assumed to constitutes wetlands.

Dominant plants observed include Fremont Cottonwood (*Populus fremontii*), willow species (*Salix* spp.), Mulefat (*Baccharis salicifolia*), and cattail (*Typha* spp.). Invasive species included Giant Reed (*Arundo donax*), tamarisk (*Tamarix* spp.), Castor Bean (*Ricinus communis*), and Russian Thistle (*Salsola tragus*), and Tree of Heaven (*Ailanthus altissima*).

Fish

There are seven species of fish that are endemic to the Santa Ana River, but only three are found today. In 2017, USGS performed snorkel surveys throughout the Santa Ana River, including through the project area (USGS, 2018). During these efforts, five species of fish were identified. Two native species were identified, the federally threatened Santa Ana Sucker *(Catostomus santaanae*) and the Arroyo Chub (*Gila orcuttii*), which is designated as a species of special concern by the state of California. Three non-native species were identified, the Yellow Bullhead (*Ameriurus natalis*), the Largemouth Bass (*Micropterus salmoides*), and the Western Mosquitofish (*Gambusia affinis).* Other non-native species that may occur in the Santa Ana River include Fathead Minnow (*Pimephales promelas*), Green Sunfish (*Lepomis cyanellus*), Bluegill (*Lepomis macrochirus*), Redbelly Tilapia (*Tilapia zilli*), and Brown Bullhead (*Ameiurus nebulosus*).

Amphibians and Reptiles

The 2017 USGS study also documented amphibian species encountered. This survey identified two non-native amphibian species: the American Bullfrog (*Lithobates catesbiana*) and the African Clawed Frog (*Xenopus laevis*). The native Pacific Treefrog (*Hyla regilla*) may also occur in the project area. The Side-blotched Lizard (*Uta stansburiana)*, Western Fence Lizard (*Sceloporus occidentalis*), Southern Alligator Lizard (*Elgaria multicarinata*), and Western Whiptail (*Cnemidophorus tigris*) are or are likely to be present (USACE, 2000; SAWA, 2004).

Birds

Riparian habitats in southern California typically support a wide variety of bird species during migration, as well as numerous native nesting bird species. Within or adjacent to the project area, many bird species are common during fall and spring migrations with some species over-wintering in the area while others breed and live in the area year-round. The patterns of migratory movements are predictable, but actual timing of peak populations vary between species and climatic conditions from year to year. Over 200 species of birds have been reported in habitats in or adjacent to the project area. Numerous vulnerable bird species are known or highly likely to occur in or adjacent to the project area, including Least Bell's Vireo (*Vireo bellii pusillus*), Yellow Warbler (*Dendroica brewsteri*), Yellow-breasted Chat (*Icteria virens*), Cooper's Hawk (*Accipiter cooperii*), Sharp-shinned Hawk (*Accipiter striatus*), and Merlin (*Falco columbarius*). Other common birds include the Black-chinned Hummingbird (*Archilochus alexandri*), Anna's Hummingbird (*Calypte anna),* Black Phoebe (*Sayornis nigricans*), Common Yellowthroat (*Geothlypis trichas*), Blue Grosbeak (*Passerina caerulea*), California Towhee (*Melozone crissalis*), Song Sparrow (*Melospiza melodia*), House Finch (*Haemorhous mexicanus*), and Lesser Goldfinch (*Spinus psaltria*). According to survey data available on eBird, a Southwestern Willow Flycatcher (*Empidonax traillii extimus*) was documented in the project area in June of 2016 (Jones and South, 2016). Numerous surveys during summer did not locate this individual and therefore the bird was considered a likely migrant.

Mammals

Most mammal species found on the Santa Ana River use it as a transportation corridor as well as for resting and foraging. Mammals that have been found along portions of the Santa Ana River include Western Harvest Mouse (*Reithrodontomys megalotis*), Deer Mouse (*Peromyscus maniculatus*), House Mouse (*Mus musculus*), Desert Cottontail (*Sylvilagus audubonii*), California Ground Squirrel (*Spermophilus beecheyi*), Botta's Pocket Gopher (*Thomomys Bottae*), raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis),* coyote (*Canis latrans*) and bobcat (*Lynx rufus*).

Invertebrates

It is expected that invertebrates in the project area are represented by a composition of insect species that commonly occur in southern California. These include representatives of various orders, such as Orthoptera (grasshoppers, crickets), Odonata (dragonflies, damselflies), Hemiptera (true bugs), Coleoptera (beetles), Diptera (flies), Hymenoptera (bees, wasps, ants), and Lepidoptera (butterflies, moths), among others.

Wildlife Movement

Linkages and corridors facilitate regional wildlife movement and are generally centered around waterways, riparian corridors, flood control channels, and contiguous upland habitat. Drainage ways generally serve as movement corridors because they are natural elements in the landscape that guide animal movement (Noss, 1991; Ndubisi *et al*., 1995; Walker and Craighead, 1997, in Hilty *et al.,* 2006). Corridors also offer wildlife unobstructed terrain for foraging and for dispersal of young individuals. Requirements for relative size and characteristic of movement corridors are different for each species that uses them. When human activities fragment landscapes, movement corridors may be altered or eliminated. Continued use of these features by wildlife depends on their ability to find adequate space, cover, food, and water, in the absence of obstacles or distractions (*e.g.*, man-made noise, lighting) that might interfere with wildlife movements.

The SAR and associated uplands are recognized as vital pathways for wildlife movement. Several migratory songbirds utilize the riparian vegetation within the SAR corridor for breeding, nesting, and foraging, or at a minimum, as transient rest sites during migration. In addition, large, wide-ranging animals, such as mountain lion, bobcat, and coyote have been documented within the SAR watershed and may utilize the SAR corridor in search of prey, water resources, or cover.

Staging Areas

Habitat within proposed project staging areas is described as part of the Riverside Lowlands Bioregion and consists of disturbed habitat with Riversidean sage scrub and annual grasslands (WRCMSHCP). Many of the bird, mammal, reptile, and invertebrate species described above for the Santa Ana River biological environment are expected to also be observed within these areas as many of them have broad geographic distributions and are common throughout the area (*e.g.*, coyote, Striped Skunk, Song Sparrow, Western Fence Lizard, etc.),

Threatened and Endangered Species

The USFWS' Information for Planning and Consultation (IPaC) web portal was utilized to identify any resources protected under the ESA that potentially occur within the project area. Table 5 summarizes the IPaC search results for listed species. The IPaC search results showed that the river corridor within the project area is designated critical habitat for Santa Ana Sucker. The river corridor just upstream of the project area beginning at the San Bernardino County line is designated critical habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*).

Table 5. Species protected under the ESA identified as potentially occurring within the project area using the IPaC web portal.

Common Name (Status)	**Species**
Animals	
San Bernardino Merriam's Kangaroo Rat (E)	*Dipodomys merriami parvus*
Stephen's Kangaroo Rat (E)	*Dipodomys stephensi*
Coastal California Gnatcatcher (T)	*Polioptila californica californica*
Least Bell's Vireo (E)	*Vireo bellii pusillus*
Southwestern Willow Flycatcher (E)	*Empidonax traillii extimus*
Santa Ana Sucker (T)	*Catostomus santaanae*
Delhi Sands Flower-Loving Fly (E)	*Rhaphiomidas terminatus abdominalis*
Plants	
Gambel's Watercress (E)	*Rorippa gambelii*
Nevin's Barberry (E)	*Berberis nevinii*
San Diego Ambrosia (E)	*Ambrosia pumila*
Santa Ana River Wooly Star (E)	*Eriastrum densifolium sanctorum*
Slender-Horned Spineflower (E)	*Dodecahema leptoceras*
ESA status of endangered (E) or threatened (T) indicated within parentheses.	

Based on data from the CNDDB obtained on April 10, 2020 and personal communications with RCFCWCD, all species have not been observed within the project area and are considered to have a low probability of occurrence with the exception of the Santa Ana River Wooly-star (SAWS), Least Bell's Vireo (LBV), and Santa Ana Sucker (SAS). These three species are present within the project area and will be discussed below.

Santa Ana River Woolly-star

The Santa Ana River Woolly-star was listed as federally endangered in 1987 and is endemic to the Santa Ana River watershed in San Bernardino, Riverside, and Orange Counties in southern California. Habitat for the Santa Ana River Woolly-star is available within the project area and results of surveys performed within the project area from 2017 - 2020 (RCFCWCD) have detected 12 populations. Final critical habitat for the species has not been proposed by the USFWS.

Least Bell's Vireo

The Least Bell's Vireo (LBV) was listed as a federally endangered in 1986. The LBV is a small migratory songbird that historically was common in lowland riparian habitat, ranging from coastal southern California through Sacramento and San Joaquin Valleys with scattered populations in Coast Ranges of the Sierra Nevada, Mojave Desert and Death Valley. Surveys conducted in 2019 identified 63 LBV territories within or immediately to the project area with 24 territories having confirmed pairs (Appendix B). Survey data from 2020 indicate a 23% decline in LBVI territories in the Riverside Ave. to Van Buren Blvd. region where the Riverside Levees project is located between 2019 and 2020. As numbers of LBVI territories have likely remained stable or declined within the project area, the data above can best be described as conservative and represent a possible upper bound for territory number within the Project Area. Designated critical habitat for the LBV has been described by the USFWS. The project area is outside of designated LBV critical habitat.

Santa Ana Sucker

The Santa Ana Sucker (SAS) was listed as a federally threatened species in 2000. SAS is a short-lived member of the sucker family (Catostomidae) that is historically endemic to the Los Angeles River, San Gabriel River, and the Santa Ana River. Currently, the SAS is restricted to three noncontiguous populations occurring in the lower Big Tujunga Creek, the East and North Forks of the San Gabriel River, and the lower and middle Santa Ana River. Based on data from the CNDDB and Santa Ana River survey data provided by the RCFCWCD, the SAS is found within the project area.

Designated critical habitat for the SAS extends along the Santa Ana River from above the Seven Oaks Dam in the San Bernardino Mountains to just south of River Rd. excluding the majority of the Prado Basin and then continues downstream from Prado Dam to Imperial Highway in Orange County (Figure 7). The Official Species List provided by the IPaC analysis did identify designated Critical Habitat for the Santa Ana Sucker within the project area (Appendix B).

Figure 8. Santa Ana Sucker designated critical habitat along the Santa Ana River with project area indicated (source: CNDDB).

State-listed Species

A search of the project area and immediately adjacent areas was performed using the California Department of Fish and Wildlife's California Natural Diversity Database (CNDDB) to determine the presence of State-listed species. Results of the search indicated that six (6) State-listed species have the potential to exist within the project area (Table 6).

Table 6. California Special-Status species identified by CNDDB and presumed to be extant within/adjacent to the project area.

Common Name (Status)	Species
Animals	
Tricolored Blackbird	*Agelaius tricolor*
Southern California Legless Lizard	*Anniella stebbinsi*
California Glossy Snake	*Arizona elegans occidentalis*
Arroyo Chub	*Gila orcuttii*
Greenest Tiger Beetle	*Cicindela tranquebarica viridissima*
Plants	
Prairie Wedge Grass	*Sphenopholis obtusata*

For the majority of these State Special-Status species, very few observations have been recorded within or adjacent to the project area since the early Twentieth Century (CNDDB) likely due to the lack of preferred habitat or its low abundance if present. Potential habitat for the Southern California Legless Lizard does exist within the project

area and a single observation of the species has been made within the project area in 2015 (CNDDB). However, the general vegetation communities associated with the species (*e.g.*, pine-oak woodlands, desert scrub, sycamores, cottonwoods, and oaks) are not present or abundant and the species is not expected to be present in high numbers. The Arroyo Chub has been observed in 2017 and 2019 USGS surveys of the project area provided by RCFCWCD.

3.2.2 Environmental Consequences

Significance Threshold:

Impacts would be considered significant if the alternative results in:

- Substantial reduction to the existing native riparian habitat or substantial changes to the existing native habitat structure.
- A substantial decline in the general wildlife population.
- Substantial loss of individuals of federally-protected species or unmitigated adverse modification of designated critical habitat.

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. With no construction activities, there would be no reduction in native riparian habitat, substantial loss in population or habitat of native wildlife or impacts to Special-Status species.

Preferred Alternative (Construction)

Riparian Habitat: During in-channel construction activities, all vegetation (approximately 30 acres in total) within the TCF will be removed to facilitate construction and provide enough room for construction equipment to operate. Outside the TCF, construction of the low-flow diversion channel would also result in removal of riparian vegetation totaling approximately 30 acres. Affected vegetation range from shrubs, saplings, and mature trees. Vegetation will be removed prior to construction, and outside of the bird breeding window (March 15 to September 15). Once the low-flow diversion channel is established and functioning, all in-channel construction activities would be limited to the TCF. Approximately 6.5 acres of the 60 acres constitute wetlands. Impacts to wetlands are further assessed in the Clean Water Act 404(b)(1) analysis.

Impacts would be temporary. After construction, all in-channel areas disturbed during construction would be revegetated with a riparian seed mix along with cuttings obtained from existing riparian vegetation within the channel. The seed mix would be augmented by the existing seed bank in the soil matrix. Due to the perennial low flows through the project reach made possible by discharges of treated water from upstream wastewater treatment plants as well as ground water, shrubs and saplings would reestablish quickly. Growth into mature trees would take several years but would vary depending on growing conditions. In total there would be a temporal loss of approximately 60 acres of vegetation representing approximately 16% of vegetation within the general project area within the river. With active revegetation and natural recruitment, affected

areas are expected to be revegetated. Thus, over the long term, there would be no loss of vegetation. Impacts would be less than significant.

General Wildlife: Construction noise and vibration would scatter wildlife present within the construction footprint to adjacent areas whether construction occurs in the river or in the uplands. However, most general wildlife present in the project area is mobile and adaptive. Furthermore, open spaces adjacent to the project footprint both in-river and in uplands are adjacent to similarly vegetated areas. Thus, wildlife would be scattered to adjoining areas that have the same habitat.

Less mobile invertebrates, amphibians, and reptiles could be buried or crushed by construction equipment. However, loss of individuals would be limited to those located within the construction footprint. Individuals outside the construction footprint would be unaffected.

Upon completion of construction, affected areas would be available for wildlife. Though the area would be initially denuded, quick regrowth of vegetation is expected. Overtime, all functions and services associated with the vegetation such as foraging, nesting, or predation avoidance would be fully restored.

Due to limited losses of individuals and presence of similar species in the surrounding open spaces, there would not be a substantial decline of the general wildlife population. Impacts would be less than significant.

Protected Species and Habitat: Construction would be located within the river and is likely to temporarily impact SAWS, LBV, SAS, and SAS Critical Habitat. Temporary impacts to SAWS, LBV, SAS, and SAS Critical Habitat due to in-river construction include the elimination of habitat, removal of SAWS populations within the construction footprint, fugitive dust, increased competition for nest sites and other resources for displaced LBV, noise, human presence, relocation of SAS into diversion channels, and potential erosion or sedimentation associated with construction resulting in discharge into the river.

To minimize impacts to SAS within diverted reaches of the River, low flow-diversion channels have been designed and will be constructed in a manner to provide suitable habitat for SAS, consistent with the quality of habitat existing within the area of impact. Habitat parameters including substrate and riverine features conducive to creating SAS habitat (e.g., altered flow, shading, and pools) have been incorporated into the low-flow diversion design. The design has been developed in coordination with a qualified biologist with knowledge of SAS habitat requirements.

With the implementation of Environmental Commitments BR-1 through BR-15 and the design and construction of low-flow diversion channels with SAS-enhanced features, impacts are expected to be minimized and long-term impacts to SAWS, LBV, SAS, or SAS Critical Habitat are not expected.

Preferred Alternative (Operations and Maintenance)

Typical O&M activities entail annual vegetation management. Structural repairs may be undertaken on as needed basis.

Riparian Habitat: Annual vegetation management entails rotational mowing so that no specific area is mowed more frequently than once every two years. Furthermore, mowing would leave the root intact to allow for regrowth. The acreage and location of mowing areas would be adjusted annually to maintain a Manning's roughness n value of 0.045.

Mowing primarily affects shrubs and saplings. Riparian vegetation located within 20 ft. of the low-flow channel would be avoided. Thus, mature riparian vegetation and associated functions such as shading for aquatic species or nesting habitat for avian species would be maintained.

Pursuant to ETL 1110-2-571, updated O&M practices would also require maintenance of a 15 ft. wide VFZ as part of annual vegetation maintenance affecting 0.8 acres. Annual mowing within the VFZ would result in the permanent loss of existing riparian vegetation representing 0.21% of the total vegetation within the project area. Impacts would be less than significant.

General Wildlife:

Impacts to general wildlife would be similar to those characterized above for construction. However, the duration would limited to a few weeks in the fall, and the geographic scope would be limited to the mowing area. Furthermore, vegetation will be removed prior to construction, and outside of the bird breeding window (March 15 to September 15).

Protected Species and Habitat: Maintenance activities are typically conducted each year outside of the riparian nesting bird season (March 15 to September 15). Areas occupied by Santa Ana River Woolly-star (*Eriastrum densifolium* subsp. Sanctorum; SAWS) would not be mowed. Furthermore, avoiding the 20-foot buffer along the low-flow channel allows for preservation of the mature riparian habitat. This habitat supports the breeding requirements of Least Bell's Vireo (*Vireo belli pusillus*; LBV) and other nesting avian species, as well as providing shade and preserving habitat for Santa Ana Sucker (*Catostomus santaanae*; SAS). Maintaining this exclusion zone near the low-flow channel also avoids any potential impacts to SAS. Surveys for the SAWS are completed annually prior to mowing activities, in accordance with USFWS/CDFW protocols, to ensure SAWS populations are avoided.

To adequately inspect levees, a 15-ft vegetation free zone (VFZ) along the toe of the levees would be maintained pursuant to USACE Engineering Technical Letter 1110-2-571 (see Figure 5b). Should the low-flow channel and the associated 20 ft. vegetation buffer encroach upon the levees, vegetation within the VFZ will not require removal if levee inspections find that levee functions would be not compromised and there would no unacceptable safety risk. If adequate inspections cannot be performed, the amount of vegetation to be removed within the VFZ will be minimized to the extent practicable to facilitate an adequate inspection of the levees to determine their functionality.

Since future operation and maintenance will avoid or minimize vegetation removal within the vicinity of the active channel, impacts to SAS are not anticipated. The fortified design is also expected to provide an increased level of protection against erosion at the toe of the levee, reducing the potential need for future maintenance and repair activities in repaired portions of the levee. Reduced maintenance and repair frequency is expected to translate to a reduced potential for future impacts to SAS critical habitat.

Based on the above and with the implementation of Environmental Commitments BR-16, BR-17, and BR-18, impacts to SAWS, LBV, SAS, and SAS Critical Habitat are not expected because of O&M activities. Impacts would be less than significant.

Environmental Commitments

- **BR-1:** Prior to construction, the construction limits will be clearly marked with high visible markers or barriers. Construction personnel will strictly limit their activities, vehicles, equipment, and construction materials to within the confines designated construction limits. The construction area(s) will be the minimal area necessary to complete the Proposed Project and will be specified in the construction plans.

- **BR-2:** A biologist/environmental monitor will monitor construction activities to ensure compliance with environmental commitments and any permit requirements associated with the Project.

- **BR-3:** Prior to construction activities, the biologist/environmental monitor shall conduct pre-construction environmental training for all construction crew members. The training shall focus on required avoidance/minimization measures and conditions of regulatory agency permits and approvals. The training shall also include a summary of sensitive species and habitats potentially present within and adjacent to the Project Area.

- **BR-4:** Dust control measures will be implemented during the construction phase to reduce excessive dust emissions. Methods for reducing dust emissions may include wetting work areas by water truck on a regular basis such as dirt access roads and sediment stockpiles, as well as covering truck beds carrying material and stockpiles.

- **BR-5:** Prior to any ground-disturbing activities (*e.g.*, mechanized clearing or rough grading) for all Project related construction activities, the biologist/environmental monitor shall conduct pre-construction surveys of the Project Area for federally protected species.

- **BR-6:** Upon construction completion, areas disturbed due to construction outside of the required levee maintenance zone will be re-vegetated with a combination of plantings and native hydroseed mix approved by the USACE. Replanted areas will be temporarily monitored and maintained to ensure the successful establishment of vegetation. Expected monitoring and maintenance activities include removal of invasive vegetation and supplemental watering, if necessary.

- **BR-7:** All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other toxic substances will occur in developed or designated non-sensitive upland areas. These areas will implement best management practices to prevent runoff carrying toxic substances from entering the Santa Ana River and associated drainages. If a spill occurs outside of a designated area, the cleanup will be immediate and documented.

- **BR-8:** Fire suppression equipment including shovels, water, and extinguishers will be available onsite during the fire season (as determined by Riverside County Fire Department) and when activities may produce sparks. Emergency contacts for the CAL FIRE Riverside Department Station No. 38 on Mission Blvd. and the Riverside City Fire Station #6 on Orange St. will be established.

- **BR-9:** To the extent feasible, the contractor will prevent exotic weeds from establishing within the work site during construction. Construction equipment will

be cleaned of mud or other debris prior to mobilizing and before leaving the site to reduce the potential spread of invasive plants and/or seeds.

- **BR-10:** Prior to construction, additional surveys will be performed for SAWS within areas that will be disturbed or de-vegetated for construction and provide appropriate habitat conditions for SAWS. Based on the number of locations to be disturbed and the number of SAWS identified, a plan will be developed to collect and store seeds for replanting. This plan will be developed by USACE in coordination with RCFCWCD and USFWS. The plan shall include details on: (1) methods for seed collection and number of seeds to be collected, (2) methods and location for seed storage, and (3) methods and timing for seed planting, including requirements to plant seeds across multiple seasons.

- **BR-11:** All vegetation required to be cleared to facilitate construction that could support LBV will be removed outside of the LBV nesting season (March 15 – August 15).

- **BR-12:** From (March 15 – August 15), the construction contractor will be required to monitor noise regularly in habitat adjacent to ongoing construction activities. The Contractor must ensure that noise levels in the adjacent habitat do not exceed 60 decibels (A-Weighted - dbA) if ambient noise measurements are less than 60 dbA; or noise levels do not increase by more than 5 dbA above ambient if ambient measurements exceed 60 dbA. This may be accomplished by modifying construction schedules to avoid working within 500 feet of riparian habitat during the nesting season and/or modifying equipment or procedures.

- **BR-13:** Construction required to divert the low-flow channel away from the construction site will occur from September 16 – February 28, a period of time outside of the SAS breeding season (Mar – June) and the riparian nesting bird season (March 15 – September 15). Segments supporting, or in close proximity to SAS breeding habitat would be diverted prior to March (*i.e.*, Left Levee diversion channel). River diversions will be performed in coordination with a biologist knowledgeable of SAS habitat requirements.

- **BR-14:** Prior to performing work in the active channel of the Santa Ana River, any SAS within the work area will be relocated. Passive techniques will be utilized initially (*i.e.*, flushing), and active relocation (*i.e.*, capture and relocation) would be used only as the last resort. If active relocations are required, relocations will be performed under the guidance of a qualified biologist permitted to handle SAS. Following the relocation of SAS from the area of construction, exclusionary methods will be implemented to ensure SAS do not recolonize the area prior to channel diversion.

- **BR-15:** To avoid and reduce impacts to SAS, the contractor will construct a temporary earthen berm on the inside edge of the construction area where the

Project Area is at risk of flooding by the main channel of the Santa Ana River. The purpose of the berm is to reduce the likelihood of channel flows entering the Project Area during a storm event, thus avoiding impacts to SAS by exclusion from the Project Area. The berm will be constructed of fill material either from onsite grading activities or from the borrow area. The contractor will be responsible for designing the berm, and the Corps will review and approve the berm design prior to construction. If the berm fails and channel flows enter the Project Area, all work in the flooded area will cease until a qualified biological monitor confirms with the Corps that work can recommence. The Corps will coordinate with USFWS prior to allowing construction to recommence. The decision to restart will be based on the following:

  - Assessment of SAS presence within the Project Area, via surveys employing techniques such as snorkel, block nets, and electro-fishing,
  - Removal of fish present, and
  - Lack of channel flows entering the Project Area within the foreseeable immediate future.

- **BR-16:** Routine maintenance activities will be conducted each year outside of the riparian nesting bird season of March 15th to September 15th.

- **BR-17:** Mowing will be conducted in a manner that does not disturb the root system. The acreage and location of mowing areas will vary annually in order to allow for vegetation regrowth, avoidance of the low-flow channel by a minimum of 20 feet from the bank, avoidance of areas with sparse vegetation, and avoidance of areas occupied by SAWS. Mowing will be conducted in a manner that avoids discharging fill material into waters of the U.S.

- **BR-18:** Prior to maintenance mowing of the channel, surveys for the SAWS will be completed in the areas identified for mowing to ensure that SAWS populations are avoided.

3.3 Cultural Resources

3.3.1 Affected Environment

Cultural resources are locations of past human activities on the landscape. The term generally includes any material remains that are at least 50 years old and are of archaeological or historical interest. Examples include archaeological sites such as lithic scatters, villages, procurement areas, resource extractions sites, rock shelters, rock art, shell middens; and historic era sites such as trash scatters, homesteads, railroads, ranches, and any structures that are over 50 years old. Under the National Historic Preservation Act (NHPA), federal agencies must consider the effects of federal undertakings on cultural resources that are listed in or eligible for listing in the National Register of Historic Places (NRHP). Cultural resources that are listed or eligible for listing in the NRHP are referred to as historic properties.

A pedestrian survey of the150-foot levee footprint corridor was competed in May 2020. Two transects approximately 10-20 meters apart were walked on the riverward side of the levees and two transects were walked along the landward side of the levees. Dense riparian vegetation hindered visibility on the riverward side of the levee. Only one cultural resource was identified during the cultural resource inventory, the Riverside levee system. Constructed in 1958, the levees meet the age threshold for consideration under the NHPA.

The levees were first altered in 1962 SR 60 Bridge, also known as the Pomona Freeway, was constructed, approximately 1,670 ft. downstream of Market Street and again in 1998 when the bridge was widened. The biggest change to the levees system occurred in 1996 when 30 groins were constructed every 480 ft. along the Left Levee. These modifications have resulted in a loss of essential integrity and the Corps has determined that the levee system is not eligible for the NRHP.

In the summer of 2021, design refinements were made including relocation of the Right Levee Staging Area requiring a follow up survey of these areas. Surveys of these areas are underway. Consultation with the State Historic Preservation Office regarding the eligibility of the levees and any other resources that are encountered during the survey will occur once the additional surveys are completed.

3.3.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative results in:

- A substantial adverse effect to a historic property such that implementation of the alternative would result in the destruction of the property or the loss of the property's eligibility.

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. There would be no ground disturbance or modifications to the existing levees. There would be no impacts to cultural resources.

Preferred Alternative (Construction)

Under the preferred alternative, the damaged sections of the levees would be rebuilt with a change in the design of the toe. Under the new design the toe would be buried approximately 20 ft. deeper but the thickness of the grouted stone (1.5 to 2 ft. thick) and slope (1 vertical: 2 horizontal) of the levee would remain relatively unchanged.

Earthmoving equipment such as loaders and excavators would operate within and outside the channel and a trench would be excavated along the riverward side of the levee. No archaeological resources were located during the pedestrian survey and the geotechnical borings indicate that the soils located adjacent to the levee are unlikely to contain in-tact archaeological deposits. Furthermore, most of the earth disturbance would occur within the area that was the previously disturbed by the construction of the original levee and groins, only deeper. The additional 20 ft. of depth would be below the elevation where archaeological sites would reasonably exist.

The Corps have initially determined that the levee is not eligible for the NRHP and therefore the changes to the levee would not result in a substantial adverse effect to a historic property. The Corps will consult with the State Historic Preservation Office regarding their finding of effect and appropriate Indian Tribes or Native American groups and/or other interested parties. Impacts would be less than significant. Implementation of Environmental Commitment CR-1 would further minimize potential for cultural impacts.

Preferred Alternative (Operations and Maintenance)

O&M activities would entail periodic vegetation removal and structural maintenance and repair. Vegetation removal includes in-channel work with rubber-tracked, skid-steer mowers. Structural maintenance would occur periodically as needed to repair storm damages. No historic properties have been identified within levee corridor so the O&M activities would not result in a substantial adverse effect to a historic property. Impacts associated with O&M activities would be less than significant.

Environmental Commitments

- CR-1: In the event that historical or archaeological resources are uncovered during construction, the USACE archaeologist would be notified within 24 hours. All work will be suspended within 50 ft. of the discovery. USACE shall follow the steps outlined in 36 CFR 800.13, post review discoveries. This would include coordination with the California State Historic Preservation Officer, the Advisory Council on Historic Preservation, and appropriate Indian Tribes or Native American groups and/or other interested parties.

3.4 Water Quality

3.4.1 Affected Environment

The Riverside Levees System is located along the SAR. Originating in the San Bernardino Mountains and terminating at the Pacific Ocean, the river is over 100 miles in length and has over 50 contributing tributaries. Sources of flow include precipitation, urban runoff, sewage plant effluent, imported flow, and naturally rising groundwater.

Upon exiting the foothills of the San Bernardino Mountains, the river mostly traverses through developed areas of San Bernardino, Riverside, and Orange Counties. Therefore, pollutants associated with urban runoff, such as bacteria, nitrates, phosphates, and metals are present in the surface water of lower reaches.

The project area is located within the geographic jurisdiction of the Santa Ana Regional Water Quality Control Board (SARWQCB). The project area is located within Reach 3 and 4 of the SARWQCB's Basin Plan. Reach 3 includes the segment of the river between Mission Boulevard Bridge and Prado Dam. Reach 4 encompasses the segment of the river between Mission Blvd. and the San Jacinto Fault Line in San Bernardino County.

Base flow in Reach 3 and 4 consists of urban runoff, rising groundwater, and discharges from the city of San Bernardino's Rapid Infiltration and Extraction Facility (RIX). Due to discharge of treated effluent from RIX, the flow regime through the Reach 3 and 4 is perennial. Consistent with the surrounding urban land uses, both reaches are on the

CWA Section 303(d) of Impaired Waters list due to high levels of bacteria, lead, and copper.

Beneficial uses in Reach 3 are agriculture (AGR), ground water recharge (GWR), direct contact water recreation (REC1); indirect water recreation (REC2), wildlife (WILD), rare species (RARE), and spawning habitat (SPWN). Beneficial uses in Reach 4 include the above except AGR.

Surface water quality objectives for both reaches include quantitative and qualitative parameters for algae, nitrogen containing compounds including ammonia, boron, chlorine containing compounds, color dissolved solids, flotables, fluoride, calcium, metals, surfactants (detergents), oil/grease, dissolved oxygen, pathogens, pH, radioactive compounds, sodium, sulfur containing compounds, taste/odor, temperature, toxic substances, and turbidity.

The SAR is a water of the U.S. and is subject to Sections 401 and 404 of the CWA. Approximately 77 acres of jurisdictional waters including 6.5 acres of wetlands are within the TCF.

Groundwater from eight wells in the project reach was sampled and tested in 2021 for chemical constituents and physical parameters regulated under Section 402 CWA. Most chemical constituents were within the allowed regulatory limits for groundwater. Other constituents were not detected. Most physical parameters (i.e., temperature, pH, etc.) were within the allowed regulatory limits except for total suspended solids. SARWQCB reviewed the sampling results and indicated that groundwater discharges would qualify for authorization under its National Pollutant Discharge Elimination System (NPDES) General De Minimis permit (Order No. R8-2020-0006).

3.4.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative results in:

- A long-term violation of state water quality standards or substantial degradation of beneficial uses.

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. There would be no in-channel construction. Groundwater would not be dewatered. There would be no impacts to water quality.

Preferred Alternative (Construction)

Except for the low-flow channel, the riverbed is dry for most of the year. Where the low-flow channel is impinged against the levee toes, in-channel construction would begin with excavation of a diversion channel to divert low flows away from the levee. The diversion channel would be excavated towards the middle of the dry riverbed. The excavated soil would be removed from the channel and placed in the uplands. Thus, most construction activities would when conditions are dry with no impacts to surface water quality. Movement of vehicles across the low-flow channel during the initial rerouting of low flows into the diversion channel would temporarily elevate turbidity in

the water column. When fully isolated from surrounding flows, construction activities within TCF would not affect water quality.

Excavation of the trench along the levee toe as well as the diversion channel would require groundwater dewatering resulting in the discharge of groundwater onto surface waters. This activity is subject to Section 402 CWA and the NPDES. Per groundwater testing results and regulatory review discussed above, groundwater dewatering qualifies for the SARWQCB's NPDES General De Minimis permit (Order No. R8-2020-0006). All applicable terms and conditions of the permit would be implemented during construction.

Fill materials to be discharged into the SAR within the TCF include rocks and grout along the levee toe. Trenches excavated to expose the toe during repair would be backfilled with excavated native alluvium and rocks. Outside the TCF is the low-flow diversion channel. To replicate SAS habitat, rocks and cobbles may be discharged within the diversion channel. All fill materials are chemically inert and would not leach contaminants into the water column. Thus, all water quality objectives would be maintained as the discharges would not introduce any of the compounds for which there are water quality objectives.

Construction would disturb consolidated soils. A temporary increase in turbidity is expected during storm flows when unconsolidated soils enter the water column. However, the increase in turbidity would not be notable since storm flows are typically turbid due to the high energy nature of the flows. Furthermore, the increase in turbidity would be temporary since, the soil matrix is primarily composed of sand and cobbles which settle out of the water column quickly. After storm flows, exposed soils are expected to reconsolidate due to the absorption of water. Thus, the potential for turbidity would be decreased in subsequent storm flows.

Construction would require excavators and dozers within the riverbed. Use of construction vehicles increases the potential for accidental release of fuels, solvents, or other petroleum-based contaminants. However, the possibility of contaminants contacting the water column is minimal since the work area would be fully isolated from surrounding flows.

Construction would retain surface flow through the project reach. Thus, beneficial uses dependent on constant flow of water such as AGR, GWR, REC1, and REC2 would not be affected. Removal of vegetation within the TCF and diversion of the low-flow channel would temporarily affect WILD, RARE, and SPWN. As discussed in the biological resources section, construction would not result in long-term loss of riparian vegetation. Furthermore, with no disruption of low flows through the project reach, there would be no long-term degradation of WILD, RARE, and SPWN.

Discharges of fill material into the SAR, a water of the US, is subject to Section 401 and 404 CWA. There would be temporary and permanent fill within jurisdictional waters. Approximately 77 acres including 6.5 acres of wetlands would be affected. However, there would be no loss of waters of the U.S. Removal of groins 18 groins located within the bounds of the Riverside Levees system (12 on the Right Levee, 6 on the Left Levee) would restore approximately two acres of the riverbed. Impacts to waters of the U.S. are

further assessed in the Clean Water Act 404(b)(1) analysis. Construction would comply terms and conditions of the Section 401 permit and the avoidance and minimization measures identified in the 404(b)(1) analysis.

Based on the above, construction would not result in a long-term violation of state water quality standards or substantial degradation of beneficial uses. Impacts would be less than significant. Implementation of Environmental Commitments HW-1 thru HW-3 as well as WQ-1 through WQ-4 would further minimize potential for water quality impacts.

Environmental Commitments

- **WQ-1:** Implement all applicable terms and conditions of the Section 401 Water Quality Certification.
- **WQ-2:** Implement all applicable terms and conditions of the Section 402 NPDES General De Minimis permit (Order No. R8-2020-0006).
- **WQ-3:** Ensure compliance with Section 404 CWA. Implement all avoidance and minimization measures.
- **WQ-4:** Develop and implement water quality monitoring during construction for basic physical parameters such turbidity, pH, and temperature.

3.5 Traffic

3.5.1 Affected Environment

The main traffic circulation elements in the vicinity of the project area include roadways with bridges crossing the river and several other major interconnecting roads. Bridge crossings include Pomona Freeway (SR-60), Riverside Avenue, Market Street, and Mission Avenue. Rubidoux Boulevard, landward of the Right Levee, connects the roadways that traverse the river except for Riverside Avenue.

The largest transportation route in the vicinity is I-215, approximately 1.5 miles to the east of the Left Levee. Figure 8 below illustrates the major circulation routes. Of these major circulation elements, SR60, and portions of both Main Street (the terminus of Riverside Avenue) and Market Street/Rubidoux Boulevard, are designated as principal arterials under Riverside County's Congestion Management Plan (Riverside County, 2011).

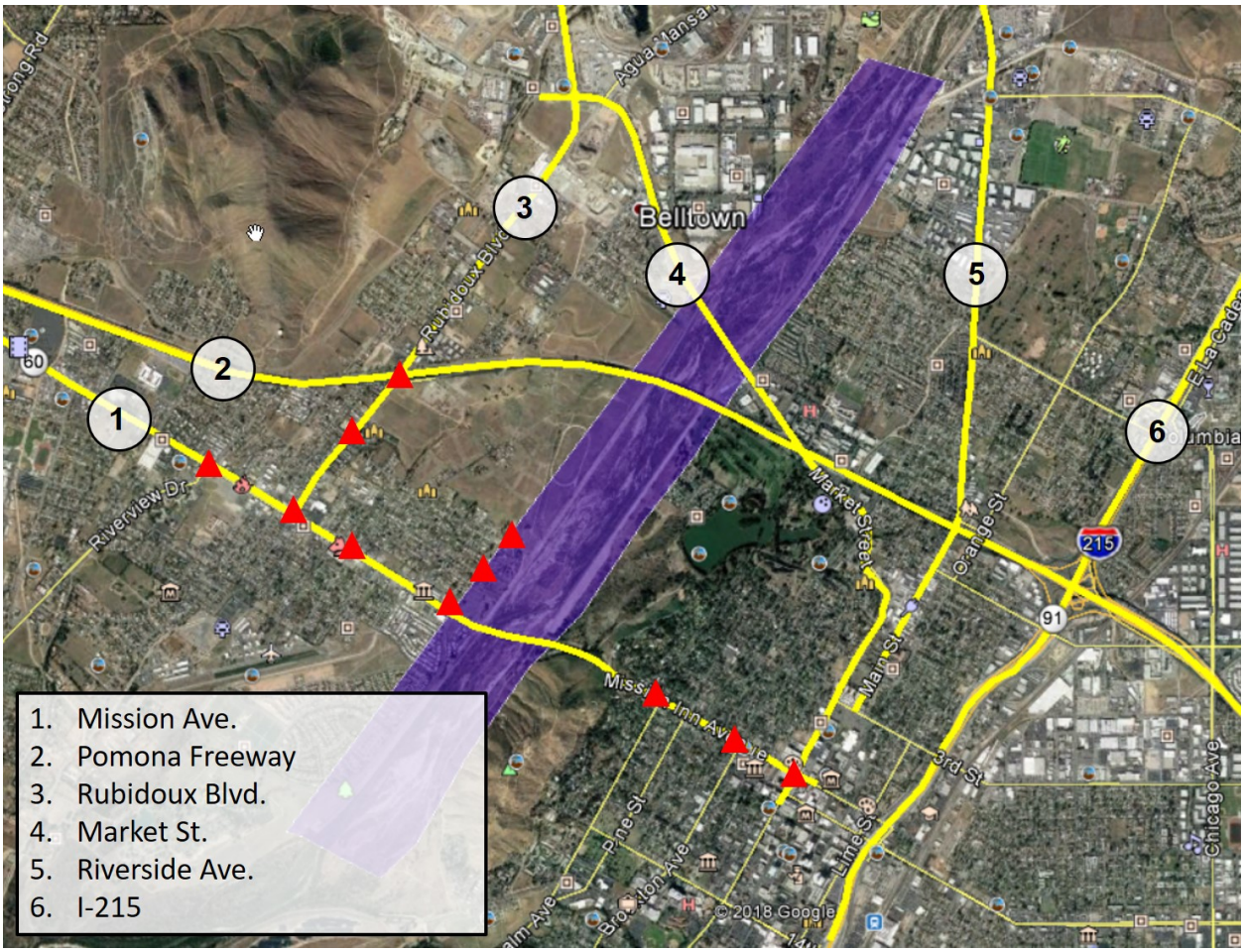


Figure 9. Major Traffic Circulation Elements Near the Project Area

The ability of local roadways to accommodate traffic is described in terms of Level of Service (LOS). The LOS scale is a qualitative indicator which uses letter grades (A-F) to represent traffic conditions. LOS A, LOS B, and LOS C represent excellent to good operating conditions, LOS D represents tolerable operating conditions for short periods of time, LOS E represents congested traffic conditions with short stop-and-go type of operations, and LOS F represents severe congestion. LOS ratings are calculated using a volume to capacity ratio (V/C) for roadway segments and Intersection Capacity Utilization (ICU) for intersections.

Table 7. Level of Service Criteria

Level of Service	V/C or ICU	Description
A	0.00 to 0.60	Little or no delay.
B	0.61 to 0.70	Short traffic delays.
C	0.71 to 0.80	Average traffic delays.
D	0.81 to 0.90	Long traffic delays.

E	0.91 to 1.00	Very long traffic delays.
F	> 1.00	Extreme traffic with capacity exceeded.

Table 8. LOS ratings for major local roadways.

Roadway	Type	Daily Capacity	Daily Volume	V/C	LOS
Market St.	2-Lane Major	17,059	25,930	1.52	F
Mission Ave.	4-Lane Arterial	35,979	26,625	0.74	C
Rubidoux Blvd.	4-Lane Major	34,004	23,123	0.68	C
Source: City of Jurupa Valley 2017 General Plan Appendices, Environmental Impact Report, Table 4-16G					

SR 60 traverses through the general project area from northwest to southeast. State Route 91, a major regional freeway, traverses the area from the southwest to the north. SR 91 transitions to Interstate 215, in interstate highway which runs south to north. Existing traffic volumes on these freeways within the project area shown below.

Table 10. Traffic volumes for nearby freeways.

Roadway	Vehicles per Day
SR 60	101,000-125,000
SR 91	160,000-197,000
I-215	151,000-173,000
Source: City of Riverside 2017 General Plan, Environmental Impact Report	

3.5.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative:

- Substantially increases traffic levels in the long term
- Caused closure of a major roadway to through traffic with no suitable route available for traffic
- Decreased safety for vehicular traffic or transit operations in the long term

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. There would be no in-channel construction. There would be no impacts to traffic.

Preferred Alternative (Construction)

Construction would require use of local roadways and highways listed above for hauling operations. There would be no changes to road alignment, elevation, lane striping, or signal operations that would decrease safety for vehicular traffic or transit operations.

Approximately 9,843 truck trips would be required to import stones and grout over the duration of three years. Furthermore, approximately 2,300 truck trips would be required to export excess soil. With approximately 261 working days per year, a three-year construction period would result in approximately 15 truck trips per day on the average.

As shown in Table 11, the increase in truck traffic would not result in any changes to the LOS ratings. Likewise, the impacts to highways would be less than 0.1% of the existing vehicle capacity. The impacts would be temporary as traffic levels would return to baseline levels upon completion of construction. Based on the above, impacts to be less than significant.

Table 11. Estimated increase in traffic for major local roadways.

Roadway	Daily Capacity	Daily Volume	Daily Construction Traffic	V/C	LOS
Market St.	17,059	25,930	15	1.52	F
Mission Ave.	35,979	26,625	15	0.74	C
Rubidoux Blvd.	34,004	23,123	15	0.68	C

Table 12. Estimated increase in traffic for nearby freeways.

Roadway	Vehicles per Day	Daily Construction Traffic	Percent Increase
SR 60	101,000-125,000	15	0.014% - 0.012%
SR 91	160,000-197,000	15	0.009% - 0.007%
I-215	151,000-173,000	15	0.009% - 0.008%

Preferred Alternative (Operations and Maintenance)

Typical O&M activities entail annual vegetation management and structural repairs on an as needed basis. O&M activities entail annual vegetation maintenance. The duration of the work would be approximately eight hours per day over 20 days. O&M activities would require use of three dump trucks and two water trucks. Duration of annual vegetation maintenance is approximately 20 days. Structural repairs could take up to 30 days. Both activities are small in scope and short in duration. Impacts would be substantially less than those characterized for construction. Impacts would be less than significant.

3.6 Noise

3.6.1 Affected Environment

Noise is defined as unwanted sound. The effects of noise on human receptors can range from annoyance to permanent hearing loss. Sound travels from a source in the form of wave, which exerts a pressure on a receptor, such as those found in the human ear. The pressure level associated by a sound wave is commonly measured in decibels (dBA), which is used to equally weight all frequencies of sound. However, the human ear is not equally sensitive to sounds at all frequencies. Therefore, the dBA scale, which primarily weighs frequencies within the human range of hearing, is used to assess the impact of noise on human hearing.

Table 13. Source and effects of common noise levels.

Noise level (dBA)	Examples	Human Receptor Response
0	recording studio	hearing threshold
20	rustling leaves	
40	conversational speech	quiet
60	freeway at 50 ft.	
70	freight train at 100 ft.	moderately loud
90	heavy truck at 50 ft.	
110	ambulance siren at 100 ft.	very loud
120	jet engine at 200 ft.	threshold of pain

Ambient Noise at the Proposed Project Area

Ambient sound levels were measured in select locations through the proposed project area. Consistent with land uses, sound levels were highest by the transportation corridors followed by developed land uses (i.e., residential and industrial). Open space areas exhibited the lowest ambient sound levels.

Three transportation corridors traversing the SAR, Mission Blvd., SR 60, and Market St., are the primary sources of ambient noise in the project area. Sound level measurements at different distances from the Market St. and SR 60 Freeway bridges are shown below.

Table 14. Ambient noise levels at bridge crossings.

Bridge Crossing	Measurement Elevation	Distance (ft.)	Ambient Sound Level (dBA)
Market St.	In Channel	130	58
SR 60 Fwy.	Atop Levee	500	51

Other contributing noise sources are the industrial, commercial, and residential land uses that are immediately adjacent to both levees.

- **Right Levee:** In general, the upstream half of the Right Levee from Market St. to approximately 0.75 miles south of SR 60 is composed of open space and is not in proximity to noise sources with the exception of transportation corridors. The downstream segment consists of residential developments. The distance of

residences from the levee varies. A group of mobile homes are within 75 ft. of the levee, while other residential developments are approximately 200 ft. away. The last quarter mile segment of the Right Levee is adjacent to Rancho Jurupa Park and agricultural fields.

- **Left Levee:** In general, the upstream half of the Left Levee from the Riverside-San Bernardino county line to SR 60, is immediately adjacent to residential and commercial land uses. Downstream of SR 60, the land uses primarily consists of open space and recreational uses with Fairmont Golf Course, Fairmont Park, and Rubidoux Park adjoining the levee.

Table 15. Ambient noise levels at top of levees.

Right Levee	Land Use	Ambient Sound Level at Levee (dBA)
Upstream Half	Open Space	42
Downstream Half	Residential	46
Left Levee	**Land Use**	**Ambient Sound Level at Levee (dBA)**
Upstream Half	Residential & Industrial	52
Downstream Half	Open Space	42

Equipment Noise Levels

- **Haul Trucks:** Noise levels associated with diesel haul trucks at 50 ft. is approximately 76 dBA (FHWA 2006).

- **Off-Road Construction Equipment:** Typical construction equipment generates noise levels ranging from approximately 76 to 88 dBA at a distance of 50 ft. from the source, with slightly higher levels of about 88 to 91 dBA for certain types of earthmoving and impact equipment.

3.6.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative:

- Creates a long-term increase in noise levels above ambient noise levels by 5 dBA

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. There would be no noise associated with earthmoving equipment and haul trucks. Ambient noise levels would remain unchanged.

Preferred Alternative (Construction)

Earthmoving equipment such as loaders and excavators would operate within and outside the channel.

Work on the upstream segment of the Right Levee is composed of open space. With no noise receptors in the vicinity, there would be no noise impacts. Work on the downstream segment would be within the vicinity of residential developments. A group of mobile homes are within 75 ft. of the levee, while other residential developments are approximately 200 ft. away.

Though the upstream segment of the Left Levee is adjacent to residential and commercial land uses, no repair work would occur through this section since this section is undamaged. Some increase in noise level is anticipated when repair activities approach this area. The downstream segment of the Left Levee, south of SR 60, is within the vicinity of a small residential development located approximately 330 ft. to the east. As shown in Table 16 below, estimated sound levels would be commensurate with distance to receptors. Residences located between 50 ft. and 400 ft. would experience elevated sound levels during construction. At a distance of approximately 800 ft. and beyond, atmospheric dissipation would reduce sound to ambient levels. The remaining segments of the Left Levee are adjacent to parks and open space, increased sound levels would result in minimal impacts.

Sound levels associated with earthmoving equipment and haul trucks at a distance of 50 ft. are approximately 80 dBA and 76 dBA, respectively. The rate of atmospheric sound attenuation is approximately 6 dBA for every doubling of distance from a noise source. As shown in Table 16 below, estimated sound levels would be commensurate with distance to receptors. Residences located between 50 ft. and 400 ft. would experience elevated sound levels during construction. At a distance of approximately 800 ft. and beyond, atmospheric dissipation would reduce sound to ambient levels.

Sound levels associated with earthmoving equipment and haul trucks at a distance of 50 ft. are approximately 80 dBA and 76 dBA, respectively. The rate atmospheric sound attenuation is approximately 6 dBA for every doubling of distance from a noise source. As shown in Table 16 below, estimated sound levels would be commensurate with distance to receptors. Residences located between 50 ft. and 400 ft. would experience elevated sound levels during construction. At a distance of approximately 800 ft. and beyond, atmospheric dissipation would reduce sound to ambient levels.

Construction would progress in approximately 1,000 ft. segments at a rate of approximately 1.5 months for each segment. Therefore, the work would function as a mobile noise source, not remaining within a particular area for more than 1.5 months. Furthermore, not all off road construction equipment would remain atop the levees. Several equipment would operate within the channel. Thus, the levees would help attenuate sound from in-channel equipment. Noise impacts would cease upon completion of construction at each segment and return to ambient levels. There would be no long-term increase in noise levels above ambient noise levels. Impacts would be less than significant.

Table 16. Estimated ranges of sound levels at various distances.

Distance from Source	50 ft.	100 ft.	200 ft.	400 ft.	800 ft.	1600 ft.
Estimated Sound Levels	76-80 dBA	70-82 dBA	62-76 dBA	56-70 dBA	50-64 dBA	44-58 dBA

Preferred Alternative (Operations and Maintenance)

Typical O&M activities entail annual vegetation management and structural repairs on an as needed basis. Vegetation maintenance includes in-channel work with rubber-tracked, skid-steer mowers. Due to the equipment operating within the channel, the levees would help attenuate sound from the mowers. Dump trucks and an excavator would be located atop levees. The duration of the work would be approximately eight hours per day over 20 days. Noise levels would be less than those characterized for construction and would cease upon completion of work and return to ambient levels.

Periodically, large storms may cause structural damages requiring emergency repairs. Storm damage repairs typically require two excavators, two bulldozers, and two loaders operating eight hours over 30 days. Noise levels would be similar to those characterized for construction and would cease upon completion of work and return to ambient levels. There would be no long term increase in noise levels above ambient noise levels. Impacts would be less than significant.

3.7 Land Use

3.7.1 Affected Environment

The project area is located on the Santa Ana River traversing northwest Riverside County, forming a border between the City of Jurupa Valley and the City of Riverside. The reduction in flood risks provided by the levees have resulted in encroachment of commercial, industrial, recreational and residential developments immediately adjacent to both levees.

Right Levee

The City of Jurupa Valley is adjacent to the Right Levee. Land uses at the upstream terminus, immediately south of Market St. Bridge, consists of a motorsports park. For an approximate one-mile length starting approximately 0.2 mile upstream of the SR-60 and terminating approximately 0.8 mile downstream of SR 60, the levee is adjacent to open fields, including an elongated oval track. Further downstream are residential developments starting approximately 0.3-mile upstream Mission Blvd. and terminating approximately one mile downstream. The downstream terminus is adjacent to Rancho Jurupa Park and agricultural fields.

Left Levee

The City of Riverside is adjacent to the Left Levee. Land uses at the upstream terminus of the project area consists of a mix of residential housing tracts and light industry just

south of Market Street. Further downstream are several housing tracts. South of SR-60 are Fairmont Park, Lake Evans and Fairmont Golf Course. Immediately south of this development is a vegetated open space. Mount Rubidoux Park is located at the downstream terminus.

3.7.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative:

- Permanently conflicts with existing adjacent land uses.

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. There would be no construction activities requiring use of adjacent lands.

Preferred Alternative (Construction)

Construction would occur within the river and atop the levees. Ancillary and support activities would occur within the existing right of way for the levee. Thus, there would be no impacts to adjacent land uses associated with active construction activities.

Two staging areas will be established for use during construction. The Left Levee Staging Area, upstream of Riverside Avenue, would be sited on undeveloped open space with no active uses on site. Likewise, the Right Levee Staging Area, approximately 400 ft. downstream of the SR 60, would also be sited on undeveloped open space with no active uses on site. Upon completion of construction, all equipment and materials would be removed, and the staging areas would be vacated as open space. Thus, impacts would be temporary.

Based on the above, there would be no permanent conflicts with existing land uses. Impacts would be less than significant.

Preferred Alternative (Operations and Maintenance)

Typical O&M activities entail annual vegetation management and structural repairs on an as needed basis. Both activities occur in the channel. Both activities would be conducted via exiting access ramps. Staging, when needed, would be established landside of the levees within RCFCWCD's right of way. There would be no construction activities requiring use of adjacent lands. There would be no impacts.

3.8 Hazardous Substances

3.8.1 Affected Environment

Characterization of hazardous sites in the project area were based on a review of the following databases.

- **Enviorstor:** Maintained by the California Department of Toxic Substances Control, the database tracks cleanup, permitting, enforcement, and investigation efforts at hazardous waste facilities and sites with known or potential contamination.

- **GeoTracker:** Maintained by the California Water Resources Control Board, the database tracks sites that impact, or have the potential to impact surface or ground water. Tracking provided by the database covers a variety of hazardous site types, including Leaking Underground Storage Tanks (LUST), former landfills, and contaminated private industry sites.

Landfills

The city of Riverside is adjacent to the Left Levee. Historically, the unincorporated area of Rubidoux to the west (now the City of Jurupa Valley), across the Santa Ana River, were open areas with sparse development. It is in these areas where landfills are located. Within a one-mile radius of the project area are two inactive municipal solid waste landfills, Belltown Landfill and West Riverside Landfill. Both are located west of the Right Levee between Market Street and SR60.

The 15-acre Belltown Landfill is located in an abandoned sand and gravel quarry. The Riverside County Waste Management Department Operated the site as a municipal landfill from 1956 to 1964. There are no mandated cleanup activities at the site. However, there are post-closure maintenance and monitoring activities including groundwater quality monitoring activities.

Nearby is the West Riverside Landfill, 68-acre Class III landfill owned by the County of Riverside. The site was operational from 1965 to 1983. However, there are post-closure maintenance and monitoring activities including groundwater quality monitoring activities.

Underground Storage Tanks

Permitted underground storage tanks (UST) are located throughout the city of Riverside and in the City of Jurupa Valley. Most are existing gas stations; exceptions include Riverside Community Hospital. Eleven USTs are located adjacent to the Left Levee due to more development in the city of Riverside compare to the six USTs in the City of Jurupa Valley where development is relatively less.

Completed leaking underground storage tank (LUST) remediation sites are present throughout the project area. Approximately 15 LUSTs are located adjacent to the Left Levee due to more development in the city of Riverside compare to the approximately 9 USTs in the City of Jurupa Valley where development is relatively less. Approximately half other LUST sites are gas stations or motor vehicle related businesses.

Superfund Sites

One active Superfund Site, Alark Hard Chrome, is located approximately one mile landward of the Left Levee in the City of Riverside. Though operations ceased in 1985, work at the chrome plating facility resulted in soil contaminated with Cadmium, Chromium III, Chromium VI, Lead, and Nickel. A total of 1,810 tons of contaminated soil was excavated and transported to a treatment and disposal facility. The excavated area was backfilled, and a temporary cap was constructed. Initial results of the groundwater investigation detected hexavalent chromium in the groundwater. Additional remediation efforts await further action from the U.S. EPA.

3.8.2 Environmental Consequences

Significance Threshold:

Impacts would be considered significant if the alternative results in:

- Long-term exposure of humans, wildlife, wildlife habitat and the general environment to hazardous materials.

Preferred Alternative (Construction)

Construction would be located within the river. In-river construction would not disturb nearby landfills, underground storage tanks, or Superfund sites.

Excavation: Construction would require excavation of in-situ soils. Analysis of soil samples for the proposed action indicate presence of silty sands and poorly to well-graded sands containing varying amounts of gravel and fines. Thus, the potential for adhesion of hazardous chemical constituents the soil matrix is low. Therefore, physical disturbance of the in-situ soils is unlikely to result in release of hazardous or toxic chemicals.

Groundwater Dewatering: The trench excavated for construction of the extended grouted stone toe would require groundwater dewatering. Groundwater would be pumped from the trench and discharge onto surface waters. This discharge is subject to National Pollutant Discharge Elimination System (NPDES) regulations pursuant to Section 402 CWA. The NPDES permit for the proposed action would require water quality monitoring for the duration of construction. If monitoring indicates exceedances of regulatory thresholds, groundwater would be treated to meet regulatory standards prior to discharge onto surface waters.

Fuel Spills: Use of construction vehicles increases the potential for accidental release of fuels, solvents, or other petroleum-based contaminants. However, the possibility of contaminants coming into contact with the water column is unlikely since the work area would be fully isolated from surrounding flows. Furthermore, a spill prevention and response plan would be implemented for the duration of construction. The plan would establish designated fueling areas in the uplands, prescribed best management practices to avoid fuel spills, and prescribe procedures for containment and disposal of fuel spills.

Based on the above and with implementation of Environmental Commitments HW-1, HW-2 and HW-3, there would be no long-term exposure of humans, wildlife, wildlife habitat and the general environment to hazardous materials. Impacts would be less than significant.

Preferred Alternative (Operations and Maintenance)

O&M activities would be located within the river. In-river activities would not disturb nearby landfills, underground storage tanks, or Superfund sites.

Typical O&M activities entail annual vegetation management and structural repairs on an as needed basis. Vegetation maintenance includes in-channel work with rubber-tracked, skid-steer mowers. With use of mechanized equipment, there is potential for accidental release of fuels, solvents, or other petroleum-based contaminants.

Structural maintenance would occur periodically as needed to repair storm damages. In-channel earthmoving, excavations, groundwater dewatering may occur.

Based on the above and with implementation of Environmental Commitments HW-1, HW-2 and HW-3, there would be no long-term exposure of humans, wildlife, wildlife habitat and the general environment to hazardous materials. Impacts would be less than significant.

Environmental Commitments

- **HW-1:** Comply with NPDES regulations implemented by the Santa Ana Regional Water Quality Control Board for dewatering activities.
- **HW-2:** Establish staging and refueling areas outside the Santa Ana River.
- **HW-3:** Prepare and implement a Spill Prevention and Response Plan.

3.9 Recreation

3.9.1 Affected Environment

The project area is composed of developed land uses and open spaces. Some open spaces support recreational uses.

Open spaces on the Right Levee are located near the SR-60 Freeway. Immediately south of Market St. is the Adams Motorsports Park which offers paved and unpaved racing surfaces for a variety of motorized vehicles. At the downstreasm terminus of the Right Levee is Rancho Jurupa Park which offers overnight cabin rentals, picnic areas, and fishing.

Open spaces on the Left Levee are located downstream of the SR-60 Freeway. Fairmount Park and Golf Course with Fairmount Lake and Evans Lake is just south of SR-60. Fairmount Park offers many recreational opportunities including two golf courses, boating, tennis courts, a Rose Garden, lawn bowling courts and access to the Santa Ana River Trail. Immediately south of Mission Avenue is the Carlson Dog Park and Mt. Rubidoux Park with numerous trails traversing the area.

In addition to recreational facilities in the open space areas, the Left Levee itself is part of the Santa Ana River Trail, the longest multi-use trail complex in Southern California. The top of the levee supports an asphalt roadway for bicyclists and pedestrians.

3.9.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative results in:

- Substantial and long-term disruption of recreational activities.

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. There would be no construction activities that would disrupt recreational activities.

Preferred Alternative (Construction)

Construction on the Right Levee would not affect recreational activities or facilities. The levee's downstream terminus which is within the vicinity of Rancho Jurupa Park is undamaged and is not subject to repairs. As shown in Figure 4, the Right Levee Staging Area would occupy an 11-acre parcel between the levee and Crestmore Rd. The area is an open area on the outer edge of the park. No recreational facilities and or uses would be affected.

Construction of the Left Levee would require detours on segments of the Santa Ana River Trail as described above. The detours would be 8 ft.-wide roads paved with asphalt concrete that would allow for two-way traffic. Use of ramps would be required. However, the ascending and descending grades for all ramps will not exceed 8%. Signage will be posted on both ends of the trail detours to alert approaching trail users to the detours. Flagmen would be posted on this segment of the trail near the dog park as well as upstream of Riverside Ave. bridge during hours of construction.

The trail detours are projected to take place in 2024 and would last up to a year. The estimated date and duration are subject to change based on progress of construction and environmental factors such as weather and storm flows. The detours would be removed after construction and the trail atop the levee would be available for recreational uses.

With detours in place, there would be no SAR Trail use disruptions during construction. Impacts would be less than significant.

Temporary construction access would be required through the access road to Carlson Dog Park (Scout Ln.) at the outset of construction in fall 2022 for approximately six months. During this time, the park would not be available for use during hours of construction. However, the park would be available for use in the early mornings and evening outside of construction hours during weekdays. There would be no restrictions on use during weekends. The temporary reduction in operating hours would not result in substantial and long-term disruption of recreational activities. Impacts would be less than significant.

Preferred Alternative (Operations and Maintenance)

Typical O&M activities entail annual vegetation management and structural repairs on an as needed basis. Both activities occur in the channel. Both activities would be conducted via exiting access ramps. Staging, when needed, would be located off the Santa Ana River Trail along the shoulder, or atop spillways. Larger staging areas would be established landside of the levees within RCFCWCD's right of way. Thus, O&M activities would not impact recreational activities or facilities.

Environmental Commitments

- **REC-1:** Coordinate the design and alignments for detours of the Santa Ana River Trail with Riverside County Regional Park and Open-Space District and the City of Riverside.

- **REC-2:** Post signage on both ends of the trail detours to alert approaching trail users to the detours.

- **Rec-3:** Post flagmen on both ends of the trail detours during hours of construction to alert approaching trail users to the detours.

3.10 Aesthetics

3.10.1 Affected Environment

The general area typically consists of a mix of urban environments and distant mountains. The vista consists of rectangular shapes and linear lines associated with an urban environment in the foreground. The background is composed of triangular shapes and undulating lines associated with the surrounding mountains: Mt. Rubidoux to the southeast, the La Loma Hills to the north, and the Jurupa Mountains to the west.

The Santa Ana River corridor within the project area consists of braided riverine channels intermixed with areas of riparian vegetation consistent with typical of southern California alluvial systems. While the river is constrained by the adjacent levee systems, the channel corridor is broad with minimal removal or maintenance of vegetation. Consistent with the above the associated vista is framed by linear lines, sharp angles and other geometric forms as well as varying hues of beige and gray and textures associated the engineered levee structure. A distinct linear border demarcates the interface between the levee toe and the soft bottom riverbed. Varying hues of beige and light green associated with vegetated sandbars intertwine with undulating lines of low-flow channels that are dark green due to the dense riparian vegetation that grow at their outer edges.

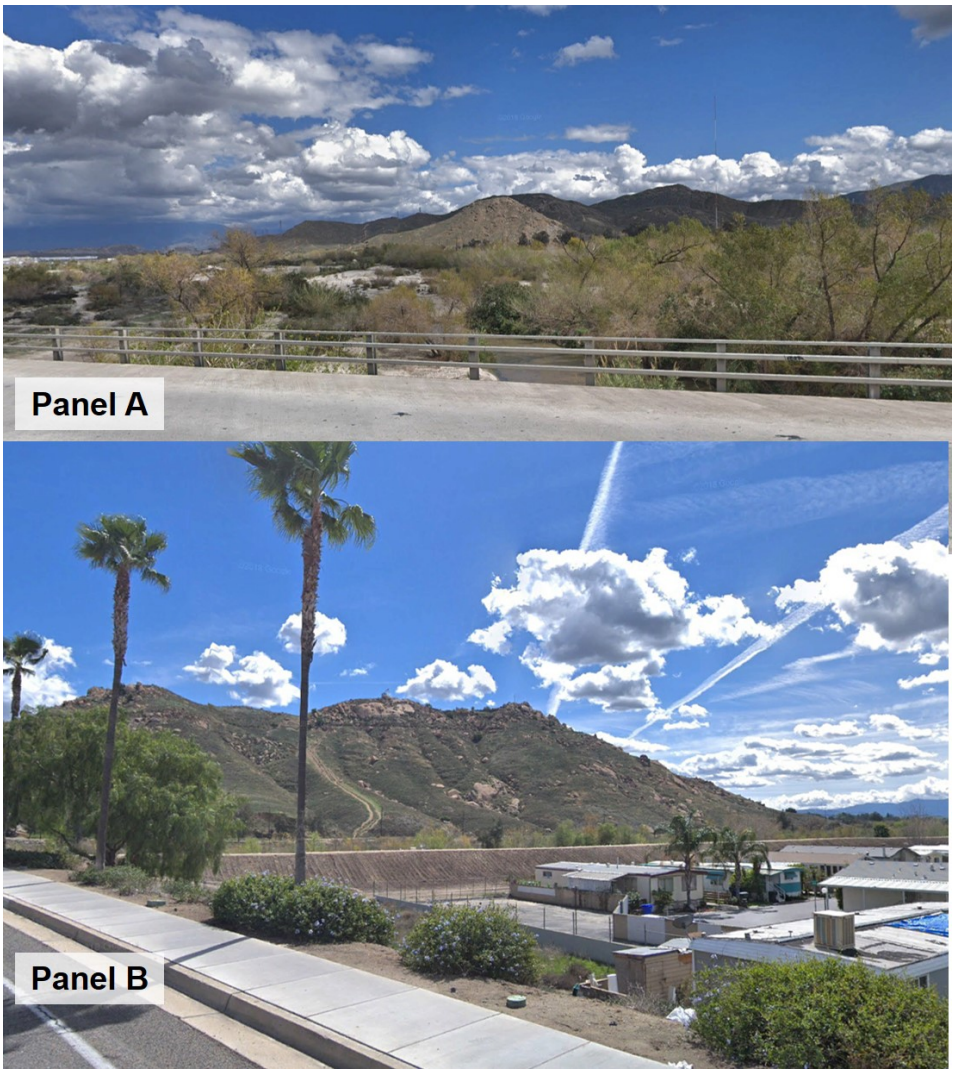


Figure 10. Typical viewsheds from within the project area. Panel A: Viewshed along the Santa Ana River corridor looking north from Riverside Avenue towards the La Loma Hills. Panel B: Viewshed to the east looking at Mt. Rubidoux from Mission Blvd. highlighting the mixed urban and mountain views.

3.10.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative:

- Permanently alters the existing vista.
- Impairs or obstructs views of major visual elements.

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. There would be no in-channel construction. There would be no impacts to aesthetics.

Preferred Alternative (Construction)

The proposed action would not result in the construction of new structures that would impair or obstructs views of major visual elements.

Levee repair activities would require use of off-road equipment such as three excavators, loaders, and bulldozers within the riverbed. Thus, earthmoving equipment with highly visible paint schemes and colors would be temporarily present in the SAR for the duration of construction.

Establishment of the TCF along the levee toe would temporarily introduce visible linear forms into the construction footprint. All vegetation within the area would be cleared and grubbed including deep-rooted, mature vegetation. Thus, the area would be temporarily devoid of heterogeneous forms and textures as well as a natural color palette associated vegetation and replaced with a homogeneous earthen environment with various hues of beige and brown. Upon completion of construction, the TCF would be removed.

The affected area would subsequently be temporarily devoid of heterogeneous forms and textures as well as a natural color palette associated vegetation and replaced with a homogeneous earthen environment with various hues of beige and brown. However, vegetation is expected to naturally reestablish in the area due to the perennial flows and existing seed bank. Thus, impacts would not be permanent since regrowth would restore visual heterogeneity associated with shrub vegetation. The aesthetics would be cohesive with the larger aesthetics of the channel.

Establishment of the low-flow diversion channel would also temporarily introduce visible linear forms into the construction footprint. The diversion channel would be excavated from the alluvial substrate and vegetated. Subsequent to construction, the channel would remain in place. Though linear in form, the channel would retain all aesthetic elements of the vegetated riverbed. The aesthetics of the diversion channel would be cohesive with the larger aesthetics of the channel.

Based on the above, the existing vista would not be permanently altered. Impacts would be less than significant.

Preferred Alternative (Operations and Maintenance)

Typical O&M activities entail annual vegetation management and structural repairs on an as needed basis.

Annual vegetation maintenance consists of mowing conducted in a manner to not disturb the root system. The acreage and location of mowing areas vary annually and are primarily determined by the following criteria: alternating mowing areas to allow for vegetation regrowth. This practice would maintain the aesthetics of a vegetated channel and the maintained areas would remain visually cohesive with the other reaches. Subsequent to mowing, vegetation regrowth is expected due to the intact root structure left in place.

Furthermore, pursuant to ETL 1110-2-571, updated O&M practices would also require maintenance of a 15 ft. wide VFZ as part of annual vegetation maintenance. Subsequent to construction deep-rooted, mature vegetation would no longer be present within the VFZ. The updated O&M practices would continue to maintain the condition. Thus, the VFZ would be temporarily devoid of heterogeneous forms and textures as well as a natural color palette associated vegetation and replaced with a homogeneous earthen environment with various hues of beige and brown. However, shallow-rooted riparian shrubs such as mulefat and willows are expected to naturally reestablish in the area due to the perennial flows and existing seed bank.

Structural maintenance would occur periodically as needed to repair storm damages. In-channel earthmoving, excavations, groundwater dewatering may occur. Impacts would be similar to that characterize for construction but would be smaller in scope and scale. Repair activities may require removal of vegetation. However, due to the perennial flows and existing seed bank, vegetation would quickly reestablish within the affected areas.

In general, the natural aesthetics of a vegetated channel is expected to quickly reestablish within affected areas. Based on the above, the existing vista would not be permanently altered. Impacts would be less than significant.

3.11 Soils and Substrate

3.11.1 Affected Environment

The soils within the channel are largely derived from alluvial materials that dominate the valley floor and slopes of western Riverside County where the Riverside Levees are located. The sediments within the active river channel are composed of recent alluvial deposits including alluvial gravel and sands of stream channels and alluvial sediments consisting predominately of silt, sand and gravel. According to the Natural Resource Conservation Service's map of the project area, the most prevalent alluvium soil types in the river include Dello loamy sand (25%), Tujunga loamy sand (20%), and Riverwash (37%). Loamy sand is sand-clay mixture composed primarily of sand with a smaller percentage of clay. Riverwash is composed of coarse, rounded cobbles and boulders to gravel and sand. The alluvial sediments within the river channel and below the levee fill were found to be loose to medium dense in the upper 5 to ft. below ground surface. Consequently, soil matrix is generally permeable and erodible. The erodible nature of the soil is consistent with erosions requiring repair of the levees.

3.11.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative:

- Substantially or permanently increases water erosion of soils or loss of topsoil.

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. There would be no in-channel construction. There would be no impacts to soils and substrate.

Preferred Alternative (Construction)

Construction would result in earthwork within the TCF. The topsoil would be graded for construction access roads; vegetation would the cleared and grubbed; and the substrate adjacent to the levees would be excavated to expose the levee toes. Soils naturally compacted from periodic inundation and stabilized via root masses would be disturbed. Distinct strata and areas of soils sorted over time by wind and water would be mixed into a homogeneous mixture as soils are excavated and stockpiled.

After construction, initial inundation from incoming flows would cause unconsolidated sediment to enter the water column causing some channel erosion. Water infiltration would also cause loose soils to settle and deposit. Regrowth of vegetation over time would further trap and consolidate soils. Thus, impacts would be temporary and decrease over time.

Construction would retain the existing channel design specifications. Channel width, conveyance capacity, and gradient would remain unchanged. Thus, there would be no substantial or permanent increases in water erosion of soils or loss of topsoil in the long term.

Preferred Alternative (Operations and Maintenance)

Typical O&M activities entail annual vegetation management and structural repairs on an as needed basis. Vegetation maintenance includes in-channel work with rubber-tracked, skid-steer mowers resulting in limited disturbances to the topsoil. Structural maintenance would occur periodically as needed to repair storm damages.

In-channel earthmoving and excavations may occur. Impacts would be similar but substantially less than those characterized for construction due to the localized nature of the repairs.

All O&M activities would retain the existing channel design specifications. Channel width, conveyance capacity, and gradient would remain unchanged. Thus, there would be no substantial or permanent increases in water erosion of soils or loss of topsoil in the long term. Impacts would be less than significant.

3.12 Utilities

3.12.1 Affected Environment

A review of as-built drawings and records in coordination with the RCFCWCD did not indicate presence of above ground or underground utilities within the TCF.

3.12.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative:

- Causes substantial modification or relocation of utilities resulting in long-term or widespread disruption of service.

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. There would be no impacts to utilities.

Preferred Alternative (Construction)

In-channel construction activities, including excavation, would not impact utilities as there are no above ground or underground utilities within the TCF. Establishment of staging areas would not require modification or relocation of utilities. There would be no impacts.

Preferred Alternative (Operations and Maintenance)

Typical O&M activities entail annual vegetation management and structural repairs on an as needed basis. Both activities are small in scope and short in duration. Impacts would be like those characterized for construction. Impacts would be less than significant.

3.13 Socioeconomics

3.13.1 Affected Environment

Socioeconomics

The project area is located mostly within the cities of Riverside and Jurupa Valley in Riverside County, California. A summary of key socioeconomic characteristics at the city and county level are summarized in Table 5 below. Data from Table 5 represents 2017 data and is available from the U.S. Census Bureau website at www.census.gov. As summarized in Table 5, the demographic and income characteristics in the vicinity of the project area are generally similar to those of the surrounding Riverside County.

Table 17. Regional demographic data

	Riverside County	City of Riverside	City of Jurupa Valley
Total Population			
Population - 2017	2,423,266	327,728	106,028
Population – 2010	2,189,641	303,871	N/A
Demographics			
White	35.4 %	31.1 %	22.9 %
Black	7.2 %	6.0 %	3.3 %
Hispanic/Latino	49.1 %	52.8 %	69.6 %
Asian	7.0 %	7.2 %	2.7 %
Income Characteristics			
Mean Household Income	$60,807	$62,460	$63,286

% below poverty	12.9 %	16.6 %	16.0%

3.13.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative results in:

- A substantial shift in population, housing, and employment

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. There would be no short-term economic benefits associated with temporary construction work.

Preferred Alternative (Construction)

Construction would provide temporary employment to earthmoving equipment operators, and truck drivers. The work would not require additional housing for laborers since the project is readily within commuting distance from most parts of Los Angeles, Orange, Riverside, and San Bernardino Counties. Due to the short duration, the work to be performed would not result in substantial shift in population, housing, and employment. Furthermore, the work would not entail the construction of infrastructure or utilities that would result in growth of the surrounding area, nor would the work increase capacity of existing infrastructure that would induce growth. The work would not lead to a substantial shift in population, housing, and employment. Impacts would be less than significant.

Preferred Alternative (Operations and Maintenance)

Typical O&M activities entail annual vegetation management and structural repairs on an as needed basis. Both activities are small in scope and short in duration. Impacts would be similar to those characterized for construction. Impacts would be less than significant.

3.14 Environmental Justice

3.14.1 Affected Environment

Regulatory Framework

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, require federal agencies to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income population.

The EPA has lead responsibility for implementation of Executive Order 12898. In exercising its responsibility, the EPA developed EJSCREEN, an online environmental justice screening and mapping tool, to assist federal agencies.

The Council on Environmental Quality (CEQ) has oversight of the federal government's compliance with this Executive Order and NEPA. The CEQ, in consultation with the EPA and other agencies, has prepared guidance to assist federal agencies in NEPA

compliance in its Environmental Justice: Guidance under the National Environmental Policy Act (CEQ Guidance). The CEQ Guidance provides an overview of Executive Order 12898; summarizes its relationship to NEPA; recommends methods for the integration of environmental justice analysis into NEPA documents; and definitions of key terms and concepts contained in the order.

Per the CEQ Guidance, minority refers to people who are Hispanic or Latino of any race, as well as those who are non-Hispanic or Latino of a race other than White or European-American. The same CEQ Guidance suggests low-income populations be identified using the national poverty thresholds from the U.S. Census Bureau.

Methodology

Demographic data from the EPA's EJSCREEN, an online environmental justice screening and mapping tool, served as the source data for evaluation. EJSCREEN incorporates demographic data from the U.S. Census Bureau. Two analyses recommended by the CEQ Guidance, Meaningfully Greater analysis and Fifty Percent analysis, were used to determine whether cities adjacent to the dam had a notable presence of minority or low-income population. Notable presence of either population would require either of the following results:

- Fifty Percent Analysis: The ratio of minority or low-income population of the area of analysis equals to or exceeds 50% of the total population of the area of analysis.

- Meaningfully Greater Analysis: The percentage of minority or low-income population relative of the area of analysis equals to or exceeds 50 percentile relative to the surrounding area.

The area of analysis encompassed an approximately 1-mile area extending landward of both levees.

Minority and Low-Income Populations (Fifty Percent Analysis)

The area of analysis encompassed an approximately 1-mile area extending landward of both levees. Minority and low-income populations within the assessed area are as follows. The ratio of minority population relative to the total population of the area of analysis is approximately 77%. The ratio of low-income population relative to the total population of the area of analysis is approximately 43%.

Table 18. Fifty percent analysis data.

Minority Population (%)	Low Income Population (%)
77	43

Minority and Low-Income Populations (Meaningfully Greater Analysis)

Comparison of minority and low-income demographics from the area of analysis to those of the surrounding cities are shown below.

The 50th percentile for minority and low-income populations are 77.5% and 34%, respectively. Compared to the 50th percentile values, the area of analysis for the project is slightly lower than the 50th percentile for minority population. The area of analysis for the project exceeds the 50th percentile for low-income population.

Table 19. Meaningfully greater analysis data.

Locations	Minority Population (%)	Low Income Population (%)
Jurupa Valley	78	31
Norco	45	21
Riverside (City)	69	37
Colton	84	47
Eastvale	81	16
Grand Terrace	62	32
Fontana	86	36
50th Percentile	77.5	34
Project Area of Analysis (1-mile)	77	43

Presence of Minority and Low-Income Populations

The percentage of minority populations in the area of analysis exceeds the 50% threshold for the Fifty Percent Analysis and is slightly lower than the 50th percentile for the Meaningfully Greater Analysis.

The percentage of low-income populations in the area of analysis did not exceed 50% threshold for the Fifty Percent Analysis. However, the percentage of low-income populations in the area of analysis exceeds the 50th percentile for low-income population.

Based on the above, there is notable presence of minority and low-income populations within the area of analysis for the project.

3.14.2 Environmental Consequences

Significance Threshold

Impacts would be considered significant if the alternative results in:

- Disproportionate and adverse impacts to minority and low-income populations.

No Action Alternative

Under the No Action Alternative, damages to the Riverside Levees would not be repaired. There would be no impacts to minority and low-income populations.

Preferred Alternative (Construction)

Notable proportions of minority and low-income populations are present in the area of analysis. Furthermore, the infrastructure requiring rehabilitation is fixed in place. Thus, relocating the proposed project away from the area is not possible. Thus, there would be disproportionate impacts to minority and low-income populations. However, impacts to all environmental resources are less than significant as documented throughout this EA. Thus, impacts would not be adverse.

For most site-specific resources, impacts would be confined to areas affected by construction. Impacts to biological resources from earthmoving activities would be contained within the confines of the project site. Likewise, potential impacts to cultural resources from earthmoving activities would mostly be contained within the confines of the project site including stating areas. Potential for erosion under earth resources would be limited to areas where areas affected by earthmoving activities. Most impacts would be contained within the confines of the basin. There would be no disproportionately high and adverse to minority communities or low-income communities.

Non-site-specific resources or resources where impacts can be transmitted beyond the construction area include water quality, air quality, noise, and transportation. Potential impacts to surface water quality would be avoided by construction of diversion channels to divert low flows away from active construction areas. Discharge of groundwater onto surface water would be subject to NPDES permit conditions. Thus, water quality would comply with regulatory standards. Air emissions from off-road and on-road vehicles would not surpass annual Clean Air Act General Conformity Applicability Rates. Air emissions would dissipate over the larger South Coast Air Basin. Noise impacts would be limited to the immediate vicinity of the construction area. At a distance of approximately 800 ft. and beyond, atmospheric dissipation would reduce sound to ambient levels. Traffic impacts for construction worker trips and delivery trips for aggregate and other raw materials would be dispersed onto regional arteries. Furthermore, the affected environmental resources would return to pre-project levels upon completion of construction. Based on the above, impacts would be less than significant.

Preferred Alternative (Operations and Maintenance)

Typical O&M activities entail annual vegetation management and structural repairs on an as needed basis. Both activities are small in scope and short in duration. The nature of impacts would be substantially less than those characterized for construction. Impacts would be less than significant.

4.0 CUMULATIVE IMPACTS

According to the Council on Environmental Quality's (CEQ) implementing regulations for NEPA (40 CFR 1508.7), a cumulative impact is defined as an impact on the environment which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of the undertaking organization. The status of projects in close proximity to the project

area will re-evaluated during the design phase of the project in order to update potential cumulative impacts.

Due to the localized and temporary nature of impacts associated with construction and O&M activities, the scope of analysis for cumulative impacts is limited to the project area and the area within a one-mile radius of the project.

Past

Construction of the Riverside Levees began in 1957 and was completed in 1959. The levees were altered in 1962 to accommodate SR 60. Between 1994 and1996, RCFCWCD constructed 31 stone groins of which 12 were located within the project reach. In 1998, segments of the levee beneath the SR 60 Bridge were modified to accommodate a bridge widening project.

In the first few decades after completion of construction, RCFCWCD likely kept the channel clear of all vegetation on an occasional basis since the ephemeral flow regime likely allowed for sparse vegetation in the river. In the subsequent years, construction and operation of upstream wastewater treatment plants resulted in discharge of treated wastewater into the SAR resulting in perennial low flows through the project reach. The perennial low flows fostered robust growth of riparian vegetation along the low-flow channel. As a result, RCFCWCD began to conduct annual vegetation maintenance as part of its O&M routines in order to maintain flow conveyance through the project reach.

RCFCWCD also conducts structural repairs as needed for damages related to storm flows. Review of available Section 404 CWA Permits indicate that most activities are associated with management of the low-flow channel and repair or erosion protection of levee toes.

Table 20. List of Section 404 CWA regulatory actions in the project area.

Permit No.	Permit Type	Activity
94-00051-RRS	Special Individual Permit	Construction of 24 groins
94-00051-RRS	Permit Modification	Construction of 7 additional groins
200400155-JPL	RGP 63	Low-flow channel realignment
200500571-JPL	RGP 63	Groin repair
SPL-2007-290-DPS	NW 31	Levee toe protection
SPL-2010-00835-RJV	RGP 63	Low-flow channel realignment

Lands within the one-mile radius area surrounding the levees were incrementally developed subsequent to construction of the levees. Residential, commercial, industrial, and recreational land uses currently abut both levees.

This trend has continued into the recent past. Review of aerial photos of the area from 1995 and 2018 indicate that the Walmart Distribution Center/Fleetwood Storage and Logistics complex just south of the county line has expanded during the intervening years. A housing tract south of Hale Street and north of Market Street on the east side of the river in the city of Riverside has been developed since 1995. In Jurupa Valley, neighborhoods adjacent to the Santa Ana River just south of Mission Blvd. have expanded near Flabob airport between 2014 and 2018.

Present

RCFCWCD continues to conduct annual vegetation maintenance. Structural repairs are implemented as needed to repair storm damages. Both activities are small in scope and short in duration. The nature of impacts would be substantially less than those characterized for construction.

Future

RCFCWCD is likely to undertake a levee rehabilitation project similar to the proposed action for non-federal levees that are continuous with the Riverside Levees. The design, construction, and environmental impacts of the levee rehabilitation project are likely to be similar to those associated with the proposed action.

RCFCWCD will continue to conduct annual vegetation maintenance. Structural repairs are implemented as needed to repair storm damages. The levees would also be subject to future modifications associated with bridge and utility crossings.

Although RCFCWCD is responsible for O&M activities, USACE will continue to exercise permitting authorities pursuant to Section 404 CWA for discharges of dredged or fill material within waters of the U.S., and Section 408 of the Rivers and Harbors Act for modifications to federally-constructed structures. Continued receipt of Section 404 and Section 408 permits for the construction, modifications, and maintenance of existing and future infrastructure such as bridges and utilities are anticipated. These non-USACE projects may require issuances of Section 404 and Section 408 permits. With few exceptions, most projects are expected to be small in scope and limited to like-for-like repairs.

Within the one-mile radius area surrounding the levees, construction of the Mission Gateway Plaza and Villas project, a mixed-use development, adjacent to Mission Blvd. and the Right Levee in the City of Jurupa Valley. A draft Environmental Impact Report (EIR) for the project was released in January 2019. The EIR identified potentially significant impacts to land use, hazards, and traffic.

The County of Riverside is expected to widen Mission Boulevard and Market St. bridges over the SAR after the Riverside Levees Rehabilitation Project. Construction impacts associated with the project are likely to be localized and temporary like the proposed action.

Socioeconomics and land uses heavily influence long term and regional environmental trends. The proposed action does not alter regional socioeconomic trends. The proposed action would not entail the construction of infrastructure or utilities that would result in growth of the surrounding area, nor would the work increase capacity of

existing infrastructure that would induce growth. The work would not lead to a substantial shift in population, housing, and employment. Likewise, the proposed action would not alter land uses.

The proposed action would primarily result in temporary impacts to air quality, biological resources, noise, and traffic. However, these impacts would be minor relative to existing impacts associated with the increasingly urban environment surrounding the proposed project area. Furthermore, the affected environmental resources would return to pre-project conditions upon completion of work. As such, implementation of the proposed action would result in incremental impacts to the environment but would not result in significant environmental impacts.

5.0 LIST OF ENVIRONMENTAL COMMITMENTS

BR-1: Prior to construction, the construction limits will be clearly marked with high visible markers or barriers. Construction personnel will strictly limit their activities, vehicles, equipment, and construction materials to within the confines designated construction limits. The construction area(s) will be the minimal area necessary to complete the Proposed Project and will be specified in the construction plans.

BR-2: A biologist/environmental monitor will monitor construction activities to ensure compliance with environmental commitments and any permit requirements associated with the Project.

BR-3: Prior to construction activities, the biologist/environmental monitor shall conduct pre-construction environmental training for all construction crew members. The training shall focus on required avoidance/minimization measures and conditions of regulatory agency permits and approvals. The training shall also include a summary of sensitive species and habitats potentially present within and adjacent to the Project Area.

BR-4: Dust control measures will be implemented during the construction phase to reduce excessive dust emissions. Methods for reducing dust emissions may include wetting work areas by water truck on a regular basis such as dirt access roads and sediment stockpiles, as well as covering truck beds carrying material and stockpiles.

BR-5: Prior to any ground-disturbing activities (*e.g.*, mechanized clearing or rough grading) for all Project related construction activities, the biologist/environmental monitor shall conduct pre-construction surveys of the Project Area for federally protected species.

BR-6: Upon construction completion, areas disturbed due to construction outside of the required levee maintenance zone will be re-vegetated with a combination of plantings and native hydroseed mix approved by the Corps. Replanted areas will be temporarily monitored and maintained to ensure the successful establishment of

vegetation. Expected monitoring and maintenance activities include removal of invasive vegetation and supplemental watering, if necessary.

BR-7: All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other toxic substances will occur in developed or designated non-sensitive upland areas. These areas will implement best management practices to prevent runoff carrying toxic substances from entering the Santa Ana River and associated drainages. If a spill occurs outside of a designated area, the cleanup will be immediate and documented.

BR-8: Fire suppression equipment including shovels, water, and extinguishers will be available onsite during the fire season (as determined by Riverside County Fire Department) and when activities may produce sparks. Emergency contacts for the CAL FIRE Riverside Department Station No. 38 on Mission Blvd. and the Riverside City Fire Station #6 on Orange St. will be established.

BR-9: To the extent feasible, the contractor will prevent exotic weeds from establishing within the work site during construction. Construction equipment will be cleaned of mud or other debris prior to mobilizing and before leaving the site to reduce the potential spread of invasive plants and/or seeds.

BR-10: Prior to construction, additional surveys will be performed for SAWS within areas that will be disturbed or de-vegetated for construction and provide appropriate habitat conditions for SAWS. Based on the number of locations to be disturbed and the number of SAWS identified, a plan will be developed to collect and store seeds for replanting. This plan will be developed by USACE in coordination with RCFCWCD and USFWS. The plan shall include details on: (1) methods for seed collection and number of seeds to be collected, (2) methods and location for seed storage, and (3) methods and timing for seed planting, including requirements to plant seeds across multiple seasons.

BR-11: All vegetation required to be cleared to facilitate construction that could support LBV will be removed outside of the LBV nesting season (March 15 – August 15).

BR-12: From (March 15 – August 15), the construction contractor will be required to monitor noise regularly in habitat adjacent to ongoing construction activities. The Contractor must ensure that noise levels in the adjacent habitat do not exceed 60 decibels (A-Weighted - dbA) if ambient noise measurements are less than 60 dbA; or noise levels do not increase by more than 5 dbA above ambient if ambient measurements exceed 60 dbA. This may be accomplished by modifying construction schedules to avoid working within 500 feet of riparian habitat during the nesting season and/or modifying equipment or procedures.

BR-13: Construction required to divert the low-flow channel away from the construction site will occur from September 16 – February 28, a period of time

outside of the SAS breeding season (Mar – June) and the riparian nesting bird season (March 15 – September 15). Segments supporting, or in close proximity to SAS breeding habitat would be diverted prior to March (*i.e.*, Left Levee diversion channel). River diversions will be performed in coordination with a biologist knowledgeable of SAS habitat requirements.

BR-14: Prior to performing work in the active channel of the Santa Ana River, any SAS within the work area will be relocated. Passive techniques will be utilized initially (*i.e.*, flushing), and active relocation (*i.e*., capture and relocation) would be used only as the last resort. If active relocations are required, relocations will be performed under the guidance of a qualified biologist permitted to handle SAS. Following the relocation of SAS from the area of construction, exclusionary methods will be implemented to ensure SAS do not recolonize the area prior to channel diversion.

BR-15: To avoid and reduce impacts to SAS, the contractor will construct a temporary earthen berm on the inside edge of the construction area where the Project Area is at risk of flooding by the main channel of the Santa Ana River. The purpose of the berm is to reduce the likelihood of channel flows entering the Project Area during a storm event, thus avoiding impacts to SAS by exclusion from the Project Area. The berm will be constructed of fill material either from onsite grading activities or from the borrow area. The contractor will be responsible for designing the berm, and the Corps will review and approve the berm design prior to construction. If the berm fails and channel flows enter the Project Area, all work in the flooded area will cease until a qualified biological monitor confirms with the Corps that work can recommence. The Corps will coordinate with USFWS prior to allowing construction to recommence. The decision to restart will be based on the following:

- Assessment of SAS presence within the Project Area, via surveys employing techniques such as snorkel, block nets, and electro-fishing,
- Removal of fish present, and
- Lack of channel flows entering the Project Area within the foreseeable immediate future.

BR-16: Routine maintenance activities will be conducted each year outside of the riparian nesting bird season of March 15th to September 15th.

BR-17: Mowing will be conducted in a manner that does not disturb the root system. The acreage and location of mowing areas will vary annually in order to allow for vegetation regrowth, avoidance of the low-flow channel by a minimum of 20 feet from the bank, avoidance of areas with sparse vegetation, and avoidance of areas occupied by SAWS. Mowing will be conducted in a manner that avoids discharging fill material into waters of the U.S.

BR-18: Prior to maintenance mowing of the channel, surveys for the SAWS will be completed in the areas identified for mowing to ensure that SAWS populations are avoided.

CR-1: In the event that historical or archaeological resources are uncovered during construction, the USACE archaeologist would be notified within 24 hours. All work will be suspended within 50 ft. of the discovery. USACE shall follow the steps outlined in 36 CFR 800.13, post review discoveries. This would include coordination with the California State Historic Preservation Officer, the Advisory Council on Historic Preservation, and appropriate Indian Tribes or Native American groups and/or other interested parties.

HW-1: Comply with NPDES regulations implemented by the Santa Ana Regional Water Quality Control Board for dewatering activities.

HW-2: Establish staging and refueling areas outside the Santa Ana River.

HW-3: Prepare and implement a Spill Prevention and Response Plan.

REC-1: Coordinate the design and alignments for detours of the Santa Ana River Trail with Riverside County Regional Park and Open-Space District and the City of Riverside.

REC-2: Post signage on both ends of the trail detours to alert approaching trail users to the detours.

REC-3: Post flagmen on both ends of the trail detours during hours of construction to alert approaching trail users to the detours.

WQ-1: Implement all applicable terms and conditions of the Section 401 Water Quality Certification.

WQ-2: Implement all applicable terms and conditions of the Section 402 NPDES General De Minimis permit (Order No. R8-2020-0006).

WQ-3: Ensure compliance with Section 404 CWA. Implement all avoidance and minimization measures.

WQ-4: Develop and implement water quality monitoring during construction for basic physical parameters such turbidity, pH, and temperature.

6.0 APPLICABLE ENVIRONMENTAL LAWS AND REGULATIONS

6.1 Clean Air Act

The Clean Air Act (CAA) regulates emissions of air pollutants to protect the nation's air quality and public health. Section 176(c) of the CAA requires federal actions to conform to US Environmental Protection Agency approved or promulgated State Implementation Plans (SIPs). However, if the total direct and indirect emissions from the Proposed Action are below the General Conformity Rule de minimis emission thresholds, the Proposed Action would be exempt from performing a comprehensive air quality conformity analysis and would be in compliance with the SIP.

As demonstrated above, the estimated emissions associated with the proposed action would not exceed the General Conformity Rule de minimis emission thresholds and would be in conformity with the SIP. Thus, the Proposed Action complies with the CAA.

6.2 Clean Water Act

The CWA governs discharges into the waters of the United States to protect water quality. In general, the Corps is responsible for construction and RCFCWCD is responsible for O&M of the Riverside Levees. The 404(b)(1) analysis demonstrates that both construction and O&M comply Section 404. So long as RCFCWCD conducts O&M operations within the scope of activities characterized in this EA, RCFCWCD would comply with Section 404. With respect to Section 401, the Corps would be responsible for compliance during construction while the RCFCWCD would need to comply separately with Section 401 for O&M.

Section 401 ensures that discharge into waters of the U.S. do not violate state or tribal water quality standards. States and authorized tribes where the discharge originates are generally responsible for issuing Water Quality Certifications (WQCs). The Santa Ana Regional Water Quality Control Board is the state agency responsible for 401 WQCs in the Proposed Action Area. Issuance of a WQC demonstrates compliance with Section 401. The Corps applied for a 401 WQC on November 30, 2021. Once issued, all terms and conditions of the WQC would be implemented.

Section 402 requires that a discharge of any pollutant or combination of pollutants to surface waters that are deemed waters of the United States be regulated by a NPDES permit. Groundwater from eight wells in the project reach was sampled and tested in 2021 for chemical constituents and physical parameters regulated under Section 402. SARWQCB reviewed the sampling results and indicated that groundwater discharges would qualify for authorization under its NPDES General De Minimis permit (Order No. R8-2020-0006). With implementation of terms and conditions of the permit, the Proposed Action would comply with Section 402.

Section 404 regulates the discharge of dredged or fill material into waters of the United States and is administered by the Corps. The Corps does not issue Section 404 permits to itself but conducts an internal assessment to ensure that all requirements of Section 404 are met. The 404(b)(1) Evaluation prepared accordance with 40 C.F.R. Part 230 demonstrates that discharges of fill associated with the Proposed Action comply with Section 404. The Proposed Action encompasses both construction and operations.

6.3 Executive Order 12898, Environmental Justice

Executive Order 12898 directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations.

There is notable presence of minority and low-income populations within the area of analysis for the project. However, the Proposed Action would rehabilitate existing infrastructure. All environmental impacts are temporary and would be less than significant. There would be no disproportionately high and adverse impacts on environmental justice communities.

6.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act makes it unlawful to possess, buy, sell, purchase, barter or "take" any migratory bird listed in Title 50 of the Code of Federal Regulations Part 10. "Take" is defined as possession or destruction of migratory birds, their nests or eggs.

Vegetation within the TCE will be removed outside the nesting season (March 15 – August 15). The TCE will be encircled by an 8 ft. tall sound wall to attenuate dispersion of noise. Within the nesting season, noise levels would be regularly monitored in habitat adjacent to the TCE in accordance with limits specified in BR-12. With implementation of these measures, the Proposed Action would comply with the MBTA.

6.5 National Historic Preservation Act

The impacts of Federal undertakings on cultural resources are formally assessed through a process mandated by the National Historic Preservation Act (NHPA) of 1966, as amended (54 U.S.C. Section 300101), and its implementing regulation, Protection of Historic Properties (36 CFR 800). Section 106 of the NHPA describes the process for identifying and evaluating historic properties, for assessing the effects of Federal undertakings on historic properties, and for consulting to avoid, reduce, or minimize adverse effects. Historic properties are cultural resources that are either included in, or are eligible for inclusion in, the National Register of Historic Places (NRHP). The Section 106 process does not require historic properties to be preserved but ensures that the decisions of Federal agencies concerning the treatment of these properties result from meaningful consideration of cultural and historic values and the options available to protect the properties.

The Corps initiated Section 106 consultation with the California State Historic Preservation Officer (SHPO) on January 21, 2020 regarding their determination of the area of potential effect (APE) and their reasonable and their good faith effort to carry out appropriate historic property identification efforts. By letter dated February 13, 2020, the SHPO did not object to the APE and provided recommendations that in addition to the proposed pedestrian survey, geotechnical boring monitoring, and evaluation of the levees, that the Corps also conduct consultation with Indian tribes and other consulting parties and complete a record search at the appropriate records center.

A cultural resource survey was conducted along proposed repair locations including the landward and riverward sides of the levee where heavy equipment would access the levee. Only one cultural resource, the Riverside Levee system, was located within the area of potential effect for the undertakings. The Corps has prepared a brief historic context statement in order to assess the eligibility of the levee. The Corps has determined that the levees are not eligible for listing in the NRHP.

As the proposed project went through further designs, the need for a haul road and additional staging areas were identified. The Corps has expanded the APE to include these additional areas and additional surveys of these new area are currently underway.

Once the surveys are complete, the Corps will consult with the SHPOs and the Federally recognized and non-Federally recognized tribes regarding the Corps' determinations of eligibility and their finding of effect.

6.6 Endangered Species Act

The Endangered Species Act (ESA) provides for conservation of endangered and threatened species as well as their habitats. Section 7 of the ESA requires federal agencies to ensure that actions are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species.

The Proposed Action would temporarily impact the SAWS, LBV, SAS, and SAS Critical Habitat. In-river construction includes the temporary removal of aquatic and riparian habitat, possible temporary removal of SAWS populations within the construction footprint, fugitive dust, increased competition for nest sites and other resources for displaced LBV, noise, human presence, relocation of SAS into diversion channels, and potential erosion or sedimentation associated with construction resulting in discharge into the river.

The primary ESA constraint associated with the Proposed Action is presence of both the SAS and its Critical Habitat along the project reach within the Santa Ana River. To that end, the Preferred Alternative has been developed in coordination with the USFWS to avoid and minimize impacts to the fish and its habitat during construction and the subsequent operations and maintenance phase. Engineering design continues to be refined with receipt of avoidance and minimization measures from the USFWS.

Formal Section 7 consultation with the USFWS is underway. Based on the above, issuance of a Biological Opinion for all affected species and habitat under consultation is expected. Issuance of Biological Opinion would conclude the Section 7 process and confirm compliance with the ESA. The Biological Opinion will be included in the final EA.

7.0 PUBLIC INVOLVEMENT

- **Public Scoping Notice:** A public scoping notice was electronically broadcast on February 17, 2020. Comments were accepted until March 17, 2020. In a letter dated March 17, 2020, the USEPA provided comments. The final EA will incorporate comments received and response to comments.

- **Public Review and Comment:** The draft EA and draft 404(b)(1) were electronically broadcast on December 8, 2021 for a 15-day review and comment period. The final EA will incorporate comments received and response to comments.

8.0 AGENCY COORDINATION

8.1 California Department of Transportation (Caltrans)

Levee rehabilitation requires construction within the immediate vicinity of the SR 60 crossing over the SAR. Construction would require an encroachment permit from Caltrans. On February 18, 2021, Corps staff met with Caltrans engineering and environmental staff to initiate discussion concerning the encroachment permit. A follow up meeting occurred on September 8, 2021 to further discuss permitting requirements.

8.2 Riverside County Flood Control and Water Conservation District (RCFCWCD)

RCFCWCD is the local, non-federal agency responsible for maintenance of the Riverside Levees. RCFCWCD has been as integral part of the PED phase, participating in weekly meetings, offering design suggestions, and helping develop the O&M manual for the rehabilitated levees.

8.3 City of Riverside, Riverside County Regional Park and Open-Space District, and the San Bernardino County Regional Parks Department

Levee rehabilitation requires temporary detours to the SAR Trail and temporary use of the access road to Carlson Dog Park. The USACE has briefed all three agencies on the planned detours and uses. Additional coordination with all three agencies are underway.

8.4 Santa Ana Regional Water Control Board

Starting January 14, 2020, the Corps began coordination with the SARWQCB regarding discharge of groundwater onto surface waters in the river. Groundwater from eight wells in the project reach was sampled and tested in 2021 for chemical constituents and physical parameters regulated under Section 402 CWA. After review of testing results, SARWQCB confirmed by email dated May 27, 2021 that the proposed discharge of groundwater qualifies for the SARWQCB's NPDES General De Minimis permit (Order No. R8-2020-0006).

Pursuant to requirements of Section 401, the Corps held a pre-application meeting on September 23, 2021 with the SARWQCB.

8.5 U.S. Fish and Wildlife Service

The primary environmental constraint associated with the Riverside Levees Rehabilitation Project is the SAS and its protected habitat along the project reach within the SAR. There is a need to avoid and minimize impacts to both the fish and its habitat during construction and the subsequent the operations and maintenance phase.

To that end, the proposed design has been developed exclusively to avoid and minimize impacts to the fish and its habitat during construction and the subsequent operations and maintenance phase. In general, the fortified levee toe design would reduce the potential for structural damages and repairs after larger storm flows. A corresponding decrease in in-channel construction for repairs is expected resulting in decreased impacts to the fish and its habitat.

Coordination with the USFWS has been ongoing since inception of the proposed project. Notably, the Corps held a two-day planning charrette on August 27 and 28, 2013. The purpose of the charrette was to develop a design framework for the project that would meet the project's objectives while minimizing impacts to the SAS during construction and operations. The design guidelines, that of a fortified levee, was memorialize in the PIR.

The Corps frequently engaged the USFWS during the PED phase focusing on design details as well as avoidance and minimization measures throughout 2019 and 2020. A Biological Assessment developed in part on the on-going discussion was finalized and submitted to the USFWS on June 11, 2021 to start the formal Section 7 ESA consultation process.

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Riverside Levees Rehabilitation Project

Draft 404(b)(1) Analysis

1. CLEAN WATER ACT SECTION 404(B)(1) REGULATORY BACKGROUND

Section 404 of the Clean Water Act (CWA) governs the discharge of dredged or fill material into waters of the U.S. (WoUS). Although the Corps does not process and issue permits for its own activities, the Corps authorizes its own discharges of dredged or fill material by applying all applicable substantive legal requirements, including application of the Section 404(b)(1) Guidelines, 33 Code of Federal Regulations (C.F.R.) 336.1(a).

Under the Section 404(b)(1) Guidelines, an analysis of practicable alternatives is the primary tool used to determine whether a proposed discharge is prohibited. The Section 404(b)(1) Guidelines prohibit discharges of dredged or fill material into WoUS if a practicable alternative to the proposed discharge exists that would have less adverse impacts on the aquatic ecosystem, including wetlands, as long as the alternative does not have other significant adverse environmental impacts (40 C.F.R. 230.10(a)). An alternative is considered practicable if it is available and capable of being implemented after considering cost, existing technology, and logistics in light of overall project purpose (40 C.F.R. 230.10(a)(2)). The Section 404(b)(1) Guidelines follow a sequential approach to project planning that considers mitigation measures only after the project proponent shows no practicable alternatives are available to achieve the overall project purpose with less environmental impacts. Once it is determined that no practicable alternatives are available, the guidelines then require that appropriate and practicable steps be taken to minimize potential adverse effects on the aquatic ecosystem (40 C.F.R. 230.10(d)). Such steps may include actions controlling discharge location, material to be discharged, the fate of material after discharge or method of dispersion, and actions related to technology, plant and animal populations, or human use (40 C.F.R. 230.70-230.77).

Beyond the requirement for demonstrating that no practicable alternatives to the proposed discharge exist, the Section 404(b)(1) Guidelines also require the Corps to compile findings related to the environmental impacts of discharge of dredged or fill material. The Corps must make findings concerning the anticipated changes caused by the discharge to the physical and chemical substrate and to the biological and human use characteristics of the discharge site.

These guidelines also indicate that the level of effort associated with the preparation of the alternatives analysis be commensurate with the significance of the impact and/or discharge activity (40 C.F.R. 230.6(b)).

2. BASIC AND OVERALL PROJECT PURPOSE

Basic Project Purpose

The basic project purpose comprises the fundamental, essential, or irreducible purpose of the proposed project, and is used by the Corps to determine whether a project is water dependent. The Section 404(b)(1) Guidelines state that if an activity associated with the discharge proposed for a special aquatic site does not require access or proximity to, or siting within, the special aquatic site in question to fulfill its basic purpose, the activity is not water dependent.

The Basic Project Purpose is rehabilitation of flood risk minimization infrastructure. The activity is water dependent.

Overall Project Purpose

The overall project purpose serves as the basis for the Corps' section 404(b)(1) alternatives analysis and is determined by further defining the basic project purpose in a manner that more specifically describes the goals and accounts for logistical considerations for the project, and which allows a reasonable range of alternatives to be analyzed. It is critical that the overall project purpose be defined to provide for a meaningful evaluation of alternatives. It should not be so narrowly defined as to give undue deference to the preferred alternative, thereby unreasonably limiting the consideration of alternatives. Conversely, it should not be so broadly defined as to render the evaluation unreasonable and meaningless.

The Overall Project Purpose is to rehabilitate damaged sections of the Riverside Levees in a manner that would reduce future structural repairs and relocation of the low-flow channel.

3. JURISDICTIONAL DETERMINATION

The proposed project is in the Santa Ana River (SAR). The SAR flows directly into the Pacific Ocean, a Traditional Navigable Water. Thus, it is a WoUS. Most of the riverbed is dry with sparse vegetation.

However, the SAR has a perennial low-flow channel due to discharges of treated effluent from upstream wastewater treatments plants. The perennial flows support a riparian corridor along its alignment. The riparian vegetation includes those associated with wetlands. Although no soil samples were taken, presence of hydric soils is highly likely. Due to the presence of Santa Ana Sucker (SAS), a federally threatened fish, vegetation management activities in the river require maintenance of a 20 ft. buffer on both sides of the low-flow channel. Thus, the 20 ft. buffer on either side of the low-flow channel is assumed to be wetland WoUS. As shown in Section 5, there are approximately 77 acres of WoUS within the project footprint. Of this total, approximately 6.5 acre are wetland WoUS.

4. ALTERNATIVES CONSIDERED

Per the 404(b)(1) Guidelines, alternatives analysis required by the National Environmental Policy Act (NEPA) will generally suffice as the alternatives analysis under the Guidelines. On occasion, these NEPA documents may address a broader range of alternatives than required to be considered under Guidelines or may not have considered the alternatives in sufficient detail to respond to the requirements of these Guidelines. In the latter case, it may be necessary to supplement these NEPA documents with this additional information.

The nature of the proposed action would require work within WoUS. Furthermore, the range of alternatives carried forward under NEPA overlap with the range of alternatives to be considered under the Guidelines. Thus, the range of NEPA alternatives are sufficient for evaluation under the Guidelines.

4.1 Project Information Report Alternatives

As required under the PL 84-99 program, a Project Information Report (PIR) was prepared starting in 2012. The report was approved on September 30, 2019. A PIR consists of a damage assessment, preliminary repair designs, construction costs, and an evaluation of potential environmental impacts as well as identification of potential environmental or regulatory constraints.

Like-for-Like Repair

Consistent with requirements of the PL 84-99 program, the 2012 iteration of the PIR focused on like-for-like repairs. That is, the levees and groins would have been repaired to their pre-damage configurations and specifications. Like-for-like repairs would require extensive in-channel construction. Furthermore, the reconstructed structures would continue to remain vulnerable to erosion from large storm flows and impingement of the low-flow channel against the levees. Thus, there would be periodic needs to reconstruct damaged structures. Likewise, there would be periodic disturbance to the SAS, and its designated habitat that are present in the proposed project area. The U.S. Fish and Wildlife Service (USFWS) expressed concern that the effects to the species and habitats could jeopardize the SAS. As a result, this alternative was not recommended.

Floodwall Alternative

In order to avoid in-channel construction and minimize disturbance to sensitive species and habitat associated with O&M activities, a floodwall alternative was evaluated. This alternative would construct a highly robust floodwall through the levee prism which would allow the low-flow channel to freely migrate. The construction costs associated with this alternative was deemed to be prohibitive. Furthermore, the benefit to cost ratio was less than unity. That is, cost would outweigh benefits. As a result, this alternative was not recommended.

Non-structural Alternative

A non-structural alternative that would remove the levees and allow the river to meander in the flood plain was evaluated pursuant to Engineering Regulation (ER) 500-1-1. This alternative was not recommended due to an increase in life safety risk.

Repair and Fortify Alternative

In 2013, the array of alternatives was further expanded to include an additional alternative to further strengthen the levee toes against erosion from low-flow channel impingement. The strengthened levee toes would be sufficiently robust to withstand low-flow channel impingement and reduce the need to relocate the low-flow channel away from the levee toes. O&M requirements would be commensurately reduced.

This alternative, also referred to as the "repair and fortify" alternative, was the result of a planning charrette held on 27-28 August, 2013 at the USACE Los Angeles District Headquarters in Los Angeles, California. The charrette included attendees from the RCFCD, USFWS, USACE staff from the Los Angeles District, South Pacific Division, and USACE Headquarters. The charrette focused on potential impacts to the SAS during construction and O&M activities associated with repair of the damaged levees. This alternative was ultimately recommended by the final PIR for design and implementation.

4.2 Pre-construction Engineering & Design Phase Alternatives

Subsequent to approval of the PIR, the USACE initiated the pre-construction engineering and design (PED) phase of the project. The PED phase focused on various "repair and fortify" designs as recommended by the PIR.

In 2020, the USACE in coordination with RCFCD, evaluated a number of design concepts in accordance with the final PIR's recommendation to evaluate the design that would strengthen and fortify the toe of the levees. Variants of the design that were evaluated but not carried forward are as follow.

Grouted Stone - Overlay atop Existing Grouted Stone (Design 1B)
Under this design, the existing grouted stone levees would be left intact in their existing condition. A new grouted stone layer would be placed atop the grouted stone surface. This alternative was not carried forward for further analysis over concerns the overlay could result in voids which could cause cracks in the new grouted stone layer.

Grouted Stone – Remove & Reconstruct with Existing Grouted Stone (Design 1C)
Under this design, the existing grouted stone levees would be removed and reconstructed using the existing stones. This alternative was not carried forward for further analysis over concerns that the size and quality of existing stones are unknown. Furthermore, inspection, sorting, and potential import of new stones to replace those

deemed unsuitable for reuse would make construction impracticable due to delays and cost increases.

Soil Cement - Remove Existing Grouted Stone (Design 2A)

Under this design, the existing grouted stone levees would be removed and an approximately 10 foot thick engineered soil cement slope would be constructed in its place. Compared to the existing grouted stone structure, the new soil cement structure would extend approximately 20 ft. deeper to provide additional scour protection. Soils required for the soil cement matrix would be acquired from the riverbed.
This alternative was not carried forward for further analysis for the following reasons. First, soil used for soil cement matrix need to meet certain specifications. However, differing soil types within the riverbed could result in construction delays and increase costs. Second, repair and maintenance of soil cement structures would be more difficult than grouted stone structures. Third, the increased thickness of the levees would decrease the width of the channel and affect conveyance capacity. Furthermore, a narrow channel would increase O&M requirements since vegetation would need to be mowed more frequently to maintain conveyance capacity.

Soil Cement - Overlay atop Existing Grouted Stone (Design 2B)
Under this design, the existing grouted stone levees would be left intact in their existing condition. An approximately 10 foot thick engineered soil cement slope would be placed atop the grouted stone surface. Compared to the existing grouted stone structure, the new soil cement structure would extend approximately 20 ft. deeper to provide additional scour protection. Soils required for the soil cement matrix would be acquired from the riverbed.

This alternative was not carried forward for further analysis for the same reasons as the Soil Cement Slope (Overlay atop Existing Grouted Stone) design. Moreover, overlay of soil cement atop the grouted stone surface could result in voids which could cause cracks in the soil cement.

Grouted Stone Toe Extension (Design C)
Under this design, the existing grouted stone levees would largely be left intact in their existing condition. The toe of the current levee would be further extended 20 feet with additional grouted stone to provide deeper scour protection.

This alternative was not carried forward for further analysis since potential structural deficiencies within the existing levees would not be corrected. Furthermore, review of as-built plans suggests that the existing grouted stone sizes would be insufficient for the proposed design criteria. Furthermore, evaluation of stone sizes and removal of stones that do not meet the design criteria would make construction impracticable resulting in delays and cost increases. Furthermore, the ability of the levee to resist erosion from low-flow channel impingement would remain unchanged. Likewise, the frequency and intensity of O&M requirements would remain unchanged.

4.3 Alternatives Analysis

Restrictions on Discharge

The 404(b)(1) Guidelines prohibit the discharge of dredged or fill material into WoUS if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. 40 C.F.R. 230.10(a). To be "practicable," an alternative must be "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." 40 C.F.R. 230.10(a)(2).

A wide range of alternatives were evaluated during the PIR and PED phases. However, most alternatives were not carried forward for evaluation in this 404(b)(1) evaluation because they do not meet the basic and overall project purpose; would result in significant impacts to non-aquatic resources; or are impracticable with respect to logistics and costs.

Table 1: Summary of Alternatives Analysis

Alternatives	Practicability Test			Significant Environmental Impacts to Non-Aquatic Resources?	Meets Overall Project Purpose?
	Cost	Logistics	Technology		
PIR Alternatives					
Like-for-Like	Yes	Yes	Yes	**Yes**	**No**
Floodwall	**No**	Yes	Yes	No	Yes
Non Structural	Yes	Yes	Yes	**Yes**	**No**
Repair and Fortify	Yes	Yes	Yes	No	Yes
PED Alternatives					
Overlay atop Existing Grouted Stone	Yes	**No**	Yes	No	Yes
Reconstruct with Existing Grouted Stone	Yes	**No**	Yes	No	Yes
Soil Cement - Remove Existing Grouted Stone	Yes	**No**	Yes	**Yes**	Yes
Soil Cement - Overlay atop Existing Grouted Stone	Yes	**No**	Yes	**Yes**	Yes
Grouted Stone Toe Extension	Yes	**No**	Yes	No	Yes
Reconstruct with New Grouted Stone	Yes	Yes	Yes	No	Yes

The PIR identified Repair and Fortify Alternative as the alternative that would have the least impacts on aquatic resources. The PED evaluated variations of the Repair and Fortify Alternative and concluded that Reconstruct with New Grouted Stone Alternative would be practicable with respect to costs, logistics, and technology. Based on the

above, the Reconstruct with New Grouted Stone Alternative is tentatively identified as Least Environmentally Damaging Practicable Alternative (LEDPA) and is carried forward for analysis in this 404(b)(1) evaluation. No other alternatives are carried forward for analysis.

5.0 Discharges of Fill for the New Grouted Stone Alternative

Construction Access

Five temporary access ramps would be constructed, three on the Left Levee and two on the Right Levee. All ramps would be constructed from alluvium excavated during construction. Access ramps would be 12 feet with a maximum height of 10 feet with 2:1 slopes (horizontal:vertical).

Temporary Construction Footrpint

An approximately 150 ft. temporary construction footprint (TCF) will be established extending into the river channel from the toe of levee. An 8 ft. high temporary wooden sound barrier will be installed along the channel side of the TCF, resulting in temporary discharges of construction materials.

All vegetation within the TCF will be removed in order to facilitate construction and provide enough room for construction equipment to operate. Vegetation will be removed prior to construction, and outside of the bird breeding window (i.e., March 15 to September 15). Clearing and grubbing will result in discharge of bulldozer sidecast and temporary stockpiling of biomass.

A trapezoidal trench will be excavated at various depths ranging from approximately 17-30 ft. resulting in temporary stockpiling of excavated earthen fill.

Along the Left Levee, two 50 ft. wide construction access roads would be constructed resulting in discharges of bulldozer sidecast.

Low-Flow Channel Diversion

The existing low-flow channel is directly adjacent to the toe of the levee in three areas requiring repair. The low-flow channel must be diverted to facilitate repair of these segments. A new diversion channel would be constructed, and berms will be utilized to shunt the existing low-flow channel into the new diversion channel and ensure flows do not enter the construction footprint. The diversion channel channel would be protected by engineered trapezoidal berms. The diversion channel and the adjacent berms would be vegetated and contain features such as pool and riffle structures. The structure would be left in place after construction is complete. However, the structure is expected to degrade overtime due to sedimentation and migration of the low-flow channel. The footprint occupied by the diversion channel would retain critical functions of WoUS: provision of habitat for the SAS. There would be no permanent loss of waters of the US.

Construction

Construction would entail mechanized equipment working within the TCF. Excavators would remove stones from the levee slope and stockpile them within the TCF. A liner would be placed atop the barren levee. New rocks would be placed atop the liner and grout would be used to fix the rocks in place. The old rocks would be placed within the trench and backfilled with previously excavated earthen fill. The TCF would be graded to match the surrounding grade of the invert. All temporary construction fill and leftover backfill would be removed from waters of the US upon completion of construction. There would be permanent fill discharged within waters of the US. However, the fill would match the profile of the original levee. Thus, there would be no loss of waters of the US.

Operations and Maintenance

Annual Vegetation Maintenance: Typical O&M activities entail annual vegetation management and structural repairs on an as needed basis. Annual vegetation management entails two elements. One is the removal of vegetation within a 15-ft. vegetation free zone (VFZ) extending from the levee toes pursuant to ETL 1110-2-571. The second element is vegetation mowing outside the VFZ. All equipment would enter the channel via existing access ramps. After vegetation is cut, it is temporarily stockpiled in the river then transported to the uplands for disposal.

Removal of vegetation from the VFZ would result in incidental fallback as well as discharge of in-situ earthen substrate. Incidental fallback is not regulated under Section 404 of the Clean Water Act. Temporary stockpiling of vegetation would result in temporary discharges of fill within waters of the US.

Storm Damage Structural Repairs: Structural repairs would be made periodically to the levees to repair damages caused by storm flows. The nature of the discharges would be similar to those characterized for construction but the scale would be substantially smaller since repairs would be limited to specific areas of the levee where damages have occurred.

6.0 New Grouted Stone Alternative Impact Characterization & Summary

6.1 Quantification of Affected Acreages

This section depicts impact areas used to quantify impact acreages. Polygons in red depict the construction footprint within the riverbed. Polygons in yellow depict wetlands within the construction footprint. For presentation purposes, the project is bisected into

two areas using Market St. as the dividing line: downstream of Market St. and upstream of Market St.

Figure 1: Construction area downstream of Market St. Stream channel (red polygon) is approximately 54 acres. Wetlands (yellow polygons) is approximately 3.8 acres.

Figure 2: Construction area upstream of Market St. Stream channel (red polygon) is approximately 23 acres. Wetlands (yellow polygons) is approximately 2.7 acres.

Table 2: Summary of Impact Areas

Market St.	Streambed (Acres)	Wetlands (Acres)
Downstream	54	3.8
Upstream	23	2.7
Total	77	6.5

6.2 Characterization of Impacts

Figure 3 shows the proposed cross section of the levee repair design. Construction would begin with clearing/grubbing and grading of the riverbed followed by excavation of the construction trench. The discharges of fill would result in temporary changes to the contour of the riverbed. The impacts would be temporary because the riverbed would be regraded to the pre-project contours after construction. Rock and backfill discharged into the construction trench constitute discharges of permanent fill. As detailed below, there would be no permanent loss in functions and services of WoUS nor would there be in increase in impermeable surfaces. Thus, there would be no loss of WoUS.

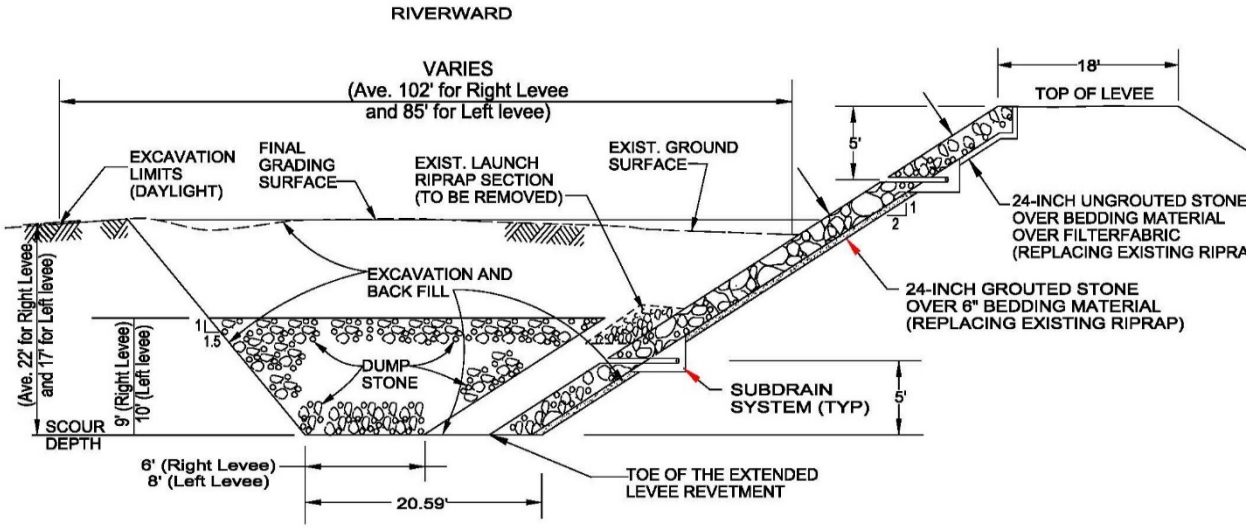
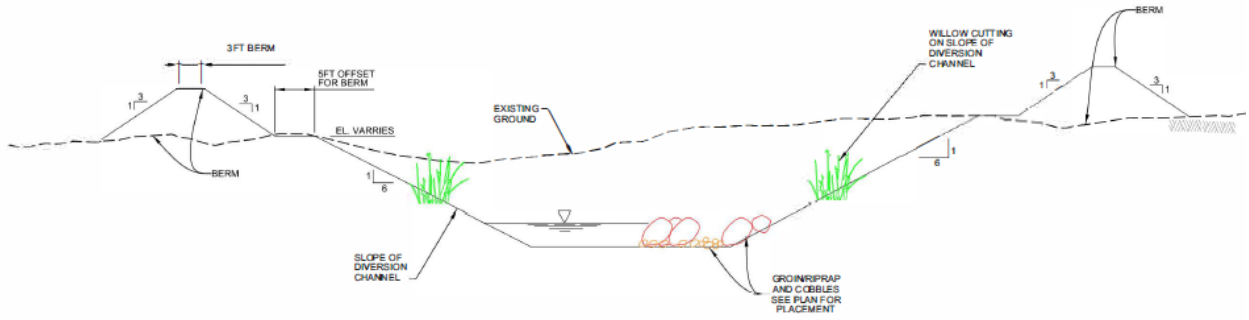


Figure 3. Cross section of the levee repair design.

Figure4 shows the proposed cross section of the low-flow diversion channel. Construction would begin with clearing/grubbing and grading of the riverbed followed by excavation of the trapezoidal channel. A portion of the excavated soil would be used to construct trapezoidal berms on both banks of the diversion channel. Because the diversion channel would be left in place after construction, the change in contour to WoUS would be long term. Future stormflows and changes in fluvial geomorphology are expected to change the engineered alignment and design of the channel. However, for the purpose of this analysis, this long-term change in contour is considered to be a permanent fill. However, as detailed below, there would be no permanent loss in functions and services of WoUS nor would there be in increase in impermeable surfaces. Thus, there would be no loss of WoUS.



TYPICAL CROSS SECTION

NOT TO SCALE

Figure 3. Cross Section of the Low-flow Diversion Channel

Summary of impacts associated with the Reconstruct with New Grouted Stone Alternative are shown below.

Table 3: New Grouted Stone Alternative - Impacts to Waters of the US

	Construction				Loss and Gain of Waters of the US (Acres)		Fill Volume (cy)
	Temporary Fill (Acres)		Permanent Fill (Acres)				
Measures	Non-Wetland Waters of the US	Wetland Waters of the US	Non-Wetland Waters of the US	Wetland Waters of the US	Permanent Loss	New Waters	
Construction (Total)	77	27.5	77	27.5	0	2	
Rock (Trench)							105,000
Soil (Trench)							430,000
Soil (Diversion Channel Berms)							6,233
Soil (Access Ramps)							7,500
O&M							
Annual Veg Mgt.	0	0	0	0	0	0	0
Structural Repairs	UND	UND	UND	UND	0	0	UND
NA = Not applicable. UND = Undeterminable							

7. ENVIRONMENTAL EFFECTS

The purpose of the Section 404(b)(1) Guidelines is to restore and maintain the chemical, physical, and biological integrity of the waters of the US through the control of discharges of dredged or fill material. Except as provided under CWA Section 404(b)(2), no discharge of dredged or fill material will be authorized if there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem, as long as the alternative does not have other significant adverse environmental consequences. In accordance with the Section 404(b)(1) Guidelines, the potential short-term or long-term effects of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic environment must be determined.

The following discussion evaluates impacts of all three alternatives on environmental resources identified in Subpart C through Subpart F of the Section 404(b)(1) Guidelines.

7.1 Potential Direct and Secondary Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C)

Substrate

Construction (Direct):

Preconstruction activities would result in temporary discharges of soil and construction materials such as k-rails, pipes, and pumps. Construction of access ramps would result in the discharge of soil. Likewise, grading activities for construction access roads or establishing a work area within the TCF would also discharge soil in the form of bulldozer sidecast. Clearing and grubbing would result in temporary discharges of biomass stockpiles which would be relocated to the uplands for disposal. An earthen berm would be constructed outside the sound wall to protect the TCF from channel-wide flows. Construction of the diversion channel would permanently discharge rocks and earthen fill within WoUS.

During construction, substrate adjacent to the levees would be excavated to expose the levee toes. Soils naturally compacted from periodic inundation and stabilized via root masses would be disturbed. Distinct strata and areas of soils sorted over time by wind and water would be mixed into a homogeneous mixture as soils are excavated and stockpiled. New rocks would be discharged and grouted in place along the levee slope. Old rocks would be discharged into the trench and previously excavated soil, stockpiled in the uplands, would be used as backfill. Thus, there would be native substrate to support aquatic functions and services after construction.

After construction all temporary construction such as sound walls would be moved to the uplands. The TCF would be regraded to restore the channel contour and disturbed areas would be revegetated.

After construction, initial inundation from incoming flows would cause unconsolidated sediment to enter the water column causing some channel erosion. Water infiltration would also cause loose soils to settle and reconsolidate. Regrowth of vegetation over time would further trap and consolidate soils. Thus, impacts would be temporary and decrease over time.

Fill proposed for permanent discharge are soil, rocks, and concrete. There would be no permanent loss of WoUS. Construction would retain the existing channel design specifications. Channel width, conveyance capacity, and gradient would remain unchanged. Thus, there would be no substantial or permanent increases in water erosion of soils or loss of topsoil in the long term. There would be no changes to the in situ riverine substrate that would affect functions and services of waters of the US.

Overall, the fortified design would provide an increased level of protection against erosion at the toe of the levee, reducing the need for periodic incursions into and construction impacts within WoUS associated with realignment of the low-flow channel. Thus, the low-flow channel would be allowed to migrate naturally within the riverbed.

Furthermore, there would no longer be a need to train the low-flow channel towards the center of the river. This would also allow for the removal of 18 groins located within the bounds of the Riverside Levees system (12 on the Right Levee, 6 on the Left Levee). Removal would restore approximately 2 acres of WoUS.

Construction (Indirect):

There would be no indirect impacts.

Operation (Direct):

Annual vegetation management activities would yield temporary discharges of biomass stockpiles in the riverbed. All temporary stockpiles would be moved into the uplands for disposal.

Periodic structural repairs would result in discharges of concrete, rocks, and in situ riverine substrate as characterized under construction. However, the scale would be substantially smaller since repairs would be limited to specific areas of the levee where damages have occurred. There would be no changes to the in situ riverine substrate that would affect functions and services of waters of the US.

Operation (Indirect):

There would be no indirect impacts.

Suspended Particulates and Turbidity

Construction (Direct):

Prior to levee rehabilitation activities, the TCF would be isolated from flows with an earthen berm. The berm would be lined with plastic sheeting anchored by k-rails or large sized sandbags to minimize erosion. Furthermore, in areas where the low-flow channel is impinged against the levee, the low-flow would be diverted into a diversion channel in the center of the river. The berms protecting the diversion channel would be hydroseeded. Fully isolated from contact with low-flows, work within the TCF would not result in turbidity.

The berms protecting the TCF and the diversion channel would likely withstand low energy, shallow, channel-wide flows. However, high energy, channel-wide high storm flows would likely erode the berms protecting the TCF and the diversion channel resulting in an increase in turbidity. Extent of erosion would be commensurate with the energy of flows. However, high energy storm flows usually tend to be turbid due to their erosive forces. Thus, it's unlikely that turbidity associated with erosion of berms would not notably increase turbidity within flows that are naturally turbid.

During construction, soils naturally compacted from periodic inundation and stabilized via root masses would be disturbed. After construction, disturbed areas would be reseeded. Furthermore, vegetation is expected to naturally reestablish in the area due

to the perennial flows and existing seed bank. Vegetation growth would further stabilize soils.

After construction, initial storm flows spreading across the width of the invert would result in temporary resuspension of loose soils within the water column. Turbidity would be temporarily increased. However, storm flows would be highly turbid. Thus, the increase in turbidity would not be notable and would subside commensurately as storm flows abate. Furthermore, the rate of resuspension is expected to decrease over time as repeated inundations would result in reconsolidation and re-compaction of loose soils.

Construction (Indirect):

There would be no indirect impacts.

Operation (Direct):

Annual vegetation management activities which primarily consists of mowing would not notably disturb substrate since the activity. Furthermore, the activity would occur in early fall, outside of storm season. Thus, there would be no notable increase in turbidity as a result of vegetation management activities.

Periodic structural repairs would occur on an emergency or non-emergency basis. Emergency repairs would likely occur during full storm flows or receding flows. In such instances, there would likely be no opportunity to dewater the work site. There would be localized increases in turbidity. However, storm flows would be highly turbid. Thus, the increase in turbidity would not be notable and would subside commensurately as storm flows abate.

Non-emergency structural repairs would likely occur outside the storm season with opportunities to divert low flows away from the work site. In such instances, turbidity impacts would be like those characterized under construction. However, the scale would be substantially smaller since repairs would be limited to specific areas of the levee where damages have occurred.

Operation (Indirect):

There would be no indirect impacts.

Contaminants

The project area is located within the geographic jurisdiction of the Santa Ana Regional Water Quality Control Board (SARWQCB). The project area is located within Reach 3 of the SARWQCB's Basin Plan. Reach 3 includes the segment of the river between Mission Boulevard Bridge and Prado Dam. Base flow in Reach 3 consists of urban runoff, rising groundwater, and discharges from the city of San Bernardino's Rapid Infiltration and Extraction Facility (RIX). Due to discharge of treated effluent from RIX, the flow regime through the Reach 3 is perennial. Consistent with the surrounding

urban land uses, Reach 3 is on the Clean Water Act Section 303(d) of Impaired Waters list due to high levels of bacteria, lead, and copper.

Construction (Direct):

Fill materials proposed for permanent discharge include native soil, rock, and concrete.

Earthmoving activities would disturb naturally compacted soils. Upon contact with the water column, contaminants that could potentially be present within the soils could migrate into the water column. However, since the disturbed soils are native to the river, most of the work within waters of the US would not introduce additional contaminants not already present within the native substrate.

Concrete leachate increases pH levels of water during the curing process. However, low flows would not contact the grout during the curing process since water would be diverted around the construction area. At some point in the future after construction, low flows will migrate naturally against the levee toes. By that time, the grout will have fully cured and there would be no changes in pH levels.

Rocks are chemically inert and would not leach contaminants into the water column.

Use of earthmoving equipment would increase the potential for accidental releases of fuels and lubricants. Prior to construction within the active channel, work areas would be isolated from nearby low flows. When fully isolated from surrounding flows, accidental releases of fuels and lubricants would not make direct contact with water. Furthermore, implementation of BMPs listed in Section 9 below would further minimize migration of contaminants into the water column. With implementation of BMPs above, impacts would be short term and minimal. There would be no indirect impacts.

Construction (Indirect):

There would be no indirect impacts.

Operation (Direct):

Annual vegetation management activities and periodic structural repairs would not result in the discharge of contaminated material. Materials likely to be discharged would be limited to in situ earthen fill, rocks, and grout. Impacts would be like those characterized under construction. However, the scale would be substantially smaller since repairs would be limited to specific areas of the levee where damages have occurred.

Operation (Indirect):

There would be no indirect impacts.

Current Patterns and Water Circulation

Construction (Direct):

Construction would not require the temporary or permanent impoundment of flows in the river. Furthermore, in areas where the low-flow channel is impinged against the levee,

the low-flow would be diverted into a diversion channel in the center of the river. Thus, there would be no impoundment of low flows during construction.

Construction would retain the existing channel design specifications. Channel width, conveyance capacity, and gradient would remain unchanged. Thus, there would be no changes to current patterns and circulation.

Construction (Indirect):

There would be no indirect impacts.

Operation (Direct):

Annual vegetation management activities and periodic structural repairs would not require the temporary or permanent impoundment of flows in the river. Annual vegetation management activities are undertaken for the purpose of maintaining the design capacity of the channel. Structural repairs would maintain the design specifications of the channel. Thus, there would be no changes to current patterns and circulation.

Operation (Indirect):

There would be no indirect impacts.

7.2 Potential Direct and Indirect Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D)

Threatened and Endangered Wildlife

Three federal protected species are present within the project area.

Santa Ana River Woolly-star: The Santa Ana River Woolly-star was listed as federally endangered plant in 1987 and is endemic to the Santa Ana River watershed in San Bernardino, Riverside, and Orange Counties in southern California. Surveys performed within the project area from 2017 - 2020 have detected 12 populations. Final critical habitat for the species has not been proposed by the USFWS.

Least Bell's Vireo: The Least Bell's Vireo (LBV) was listed as a federally endangered in 1986. The LBV is a small migratory songbird that historically was common in lowland riparian habitat, ranging from coastal southern California through Sacramento and San Joaquin Valleys with scattered populations in Coast Ranges of the Sierra Nevada, Mojave Desert and Death Valley. Surveys conducted in 2019 identified 63 LBV territories within or immediately to the project area with 24 territories having confirmed pairs. Survey data from 2020 indicate a 23% decline in LBVI territories in the Riverside Ave. to Van Buren Blvd. region where the Riverside Levees project is located between 2019 and 2020. As numbers of LBVI territories have likely remained stable or declined within the project area, the data above can best be described as conservative and represent a possible upper bound for territory number within the Project Area. The project area is outside of designated LBV critical habitat.

Santa Ana Sucker: The Santa Ana Sucker (SAS) was listed as a federally threatened species in 2000. SAS is a short-lived member of the sucker family (Catostomidae) that is historically endemic to the Los Angeles River, San Gabriel River, and the Santa Ana River. The SAS is found within the project area. Designated critical habitat for the SAS is within the project area.

Construction (Direct):

Construction would be located within the river and would temporarily impact SAWS, LBV, SAS, and SAS Critical Habitat. All vegetation within the TCF, approximately 16% of vegetation within the general project area within the river, including SAWS and riparian vegetation that provide habitat for LBVs and shading for SAS would be removed. Segments of the low-flow channel impinged against the levee toe would be disturbed since the riverbed adjacent to the levee toes would be excavated. Thus, there would be disturbance to SAS and the designated critical habitat.

Two primary minimization measures include construction of a diversion channel for the SAS and revegetation of disturbed areas after construction.

To minimize impacts to SAS within diverted reaches of the River, low flow diversion channels have been designed and will be constructed in a manner to provide suitable habitat for SAS, consistent with the quality of habitat existing within the area of impact. Habitat parameters including substrate and riverine features conducive to creating SAS habitat (e.g., altered flow, shading, and pools) have been incorporated into the low-flow diversion design. The design has been developed in coordination with a qualified biologist with knowledge of SAS habitat requirements.

After construction, all in-channel areas disturbed during construction would be revegetated with a riparian seed mix along with cuttings obtained from existing riparian vegetation within the channel. The seed mix would be augmented by the existing seed bank in the soil matrix. Due to the perennial low flows through the project reach made possible by discharges of treated water from upstream wastewater treatment plants as well as ground water, shrubs and saplings would reestablish quickly. Growth into mature trees would take several years but would vary depending on growing conditions.

With the implementation of Environmental Commitments BR-1 through BR-15 and the design and construction of low-flow diversion channels with SAS-enhanced features, impacts are expected to be minimized and long-term impacts to SAWS, LBV, SAS, or SAS Critical Habitat are not expected.

Consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act (ESA) for impacts identified above is underway for direct impacts.

Construction (Indirect):

Anticipated indirect impacts include increased competition for LBV nest sites and foraging areas until reestablishment of vegetation within areas affected by construction.

The fill would consist of earthen fill, rocks, or concrete. The fill materials are chemically inert and would not leach contaminants into the water column or result in long term impacts to turbidity. Thus, the potential for the availability of contaminants from the discharge of dredged or fill material that may lead to the bioaccumulation of such contaminants in wildlife is low.

Consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act (ESA) for impacts identified above is underway for indirect impacts.

Operation (Direct)

Typical O&M activities entail annual vegetation management. Structural repairs may be undertaken on as needed basis.

Maintenance activities are typically conducted each year outside of the riparian nesting bird season (March 15 to September 15). Areas occupied by SAWS would not be mowed. A 20-foot buffer along the low-flow channel would be avoided allowing for preservation of the mature riparian habitat. This habitat supports the breeding requirements LBV as well as providing shade and preserving habitat for the SAS. Maintaining this exclusion zone near the low-flow channel also avoids any potential impacts to SAS. Surveys for the SAWS are completed annually prior to mowing activities, in accordance with USFWS/CDFW protocols, to ensure SAWS populations are avoided.

To adequately inspect levees, a 15-ft vegetation free zone (VFZ) along the toe of the levees would be maintained pursuant to USACE Engineering Technical Letter 1110-2-571. Should the low-flow channel and the associated 20 ft. vegetation buffer encroach upon the levees, vegetation within the VFZ will not require removal if levee inspections find that levee functions would be not compromised and there would no unacceptable safety risk. If adequate inspections cannot be performed, the amount of vegetation to be removed within the VFZ will be minimized to the extent practicable to facilitate an adequate inspection of the levees to determine their functionality.

Periodic structural repairs would occur on an emergency or non-emergency basis. In general, the fortified design is also expected to provide an increased level of protection against erosion at the toe of the levee, reducing the potential need for future structural maintenance and repair activities in repaired portions of the levee. Reduced maintenance and repair frequency is expected to translate to a reduced potential for future impacts to SAS and its critical habitat.

Emergency repairs would likely occur during full storm flows or receding flows. In such instances, rocks maybe discharged to protect damaged levees. Non-emergency structural repairs would likely occur outside the storm season with opportunities to divert low flows away from the work site. In such instances, potential impacts would be like those characterized under construction. However, the scale would be substantially

smaller since repairs would be limited to specific areas of the levee where damages have occurred.

Operation (Indirect)

Indirect impacts are not anticipated. Potential discharges of fill consist of earthen fill, rocks, or concrete. The fill materials are chemically inert and would not leach contaminants into the water column or result in long term impacts to turbidity. Thus, the potential for the availability of contaminants from the discharge of dredged or fill material that may lead to the bioaccumulation of such contaminants in wildlife is low.

Other Wildlife

Construction (Direct)

Construction noise and vibration would scatter wildlife present within the construction footprint to adjacent areas whether construction occurs in the river or in the uplands. However, most general wildlife present in the project area is mobile and adaptive. Furthermore, open spaces adjacent to the project footprint both in-river and in uplands are adjacent to similarly vegetated areas. Thus, wildlife would be scattered to adjoining areas that have the same habitat.

Less mobile invertebrates, amphibians, and reptiles could be buried or crushed by construction equipment. However, loss of individuals would be limited to those located within the construction footprint. Individuals outside the construction footprint would be unaffected.

Upon completion of construction, affected areas would be available for wildlife. Though the area would be initially denuded, quick regrowth of vegetation is expected. Overtime, all functions and services associated with the vegetation such as foraging, nesting, or predation avoidance would be fully restored.

Construction (Indirect)

The fill would consist of earthen fill, rocks, or concrete. The fill materials are chemically inert and would not leach contaminants into the water column or result in long term impacts to turbidity. Thus, the potential for the availability of contaminants from the discharge of dredged or fill material that may lead to the bioaccumulation of such contaminants in wildlife is low.

Operation (Direct & Indirect)

Typical O&M activities entail annual vegetation management. Structural repairs may be undertaken on as needed basis.

Direct and indirect impacts would be similar to those characterized for Threatened and Endangered Wildlife.

Aquatic Organisms

Fish: Five species of fish are present in the river: two native species [SAS and the Arroyo Chub (*Gila orcuttii*)] and three non-native species [the Yellow Bullhead (*Ameriurus natalis*), the Largemouth Bass (*Micropterus salmoides*), and the Western Mosquitofish (*Gambusia affinis)].* Other non-native species that may occur in the Santa Ana River include Fathead Minnow (*Pimephales promelas*), Green Sunfish (*Lepomis cyanellus*), Bluegill (*Lepomis macrochirus*), Redbelly Tilapia (*Tilapia zilli*), and Brown Bullhead (*Ameiurus nebulosus*).

Amphibians: Amphibians that may be present in the river include the American Bullfrog (*Lithobates catesbiana*), African Clawed Frog (*Xenopus laevis*), the native Pacific Treefrog (*Hyla regilla*), the Side-blotched Lizard (*Uta stansburiana)*, Western Fence Lizard (*Sceloporus occidentalis*), Southern Alligator Lizard (*Elgaria multicarinata*), and Western Whiptail (*Cnemidophorus tigris*).

Construction (Direct & Indirect):

Construction would not require the temporary or permanent impoundment of flows in the river. Furthermore, in areas where the low-flow channel is impinged against the levee, the low-flow would be diverted into a diversion channel in the center of the river. Thus, fish passage through the project reach would not be disrupted during construciton. However, there would initially be an absence of shading in the diversion channel until vegetation is fully reestablished.

Though permanent fill would be discharged, there would be no loss of waters of the US. Construction would retain the existing channel design specifications. Channel width, conveyance capacity, and gradient would remain unchanged. Thus, fish migration and passage would remain unaffected in the long-term.

Construction noise and vibration would scatter amphibians present within the construction footprint to adjacent areas. Less mobile amphibians could be buried or crushed by construction equipment. However, loss of individuals would be limited to those located within the construction footprint. Individuals outside the construction footprint would be unaffected.

Upon completion of construction, affected areas would be available for amphibians. Though the area would be initially denuded, quick regrowth of vegetation is expected. Overtime, all functions and services associated with the vegetation such as foraging, nesting, or predation avoidance would be fully restored.

In general, the fortified design would provide an increased level of protection against erosion at the toe of the levee, reducing the potential need for future structural maintenance and repair activities in repaired portions of the levee. Reduced maintenance and repair frequency is expected to translate to a reduced potential for future impacts to aquatic species.

Operation (Direct & Indirect)

Typical O&M activities entail annual vegetation management. Structural repairs may be undertaken on as needed basis. Annual vegetation management activities would not require temporary or permanent impoundment of flows in the river. Furthermore, a 20-foot buffer along the low-flow channel would be avoided allowing for preservation of the mature riparian habitat. Thus, fish passage and habitat would remain unaffected.

Mower noise and vibration would scatter amphibians present within the maintenance footprint to adjacent areas. Less mobile amphibians could be buried or crushed by mowing equipment. However, loss of individuals would be limited to those located within the maintenance footprint.

Periodic structural repairs would occur on an emergency or non-emergency basis. In general, the fortified design is also expected to provide an increased level of protection against erosion at the toe of the levee, reducing the potential need for future structural maintenance and repair activities in repaired portions of the levee. Reduced maintenance and repair frequency is expected to translate to a reduced potential for future impacts to fish and fish habitat.

Emergency repairs would likely occur during full storm flows or receding flows. In such instances, rocks maybe discharged to protect damaged levees. Impoundment of storm flows in emergency situations in unlikely.

Non-emergency structural repairs would likely occur outside the storm season with opportunities to divert low flows away from the work site. In such instances, potential impacts would be like those characterized under construction. However, the scale would be substantially smaller since repairs would be limited to specific areas of the levee where damages have occurred.

7.3 Potential Direct and Indirect Impacts on Special Aquatic Sites (Subpart E)

Sanctuaries and Refuges

Construction (Direct & Indirect):

There are no sanctuaries or refuges designated under state or Federal laws or local ordinances within the construction footprint. Construction would not directly or indirectly impact sanctuaries or refuges.

Operation (Direct & Indirect):

There are no sanctuaries or refuges designated under state or Federal laws or local ordinances within the construction footprint. Operations and maintenance would not directly or indirectly impact sanctuaries or refuges.

Wetlands

Wetlands consist of areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do

support, a prevalence of vegetation typically adapted for life in saturated soil conditions. See 40 CFR 230.41.

Typical of rivers in the arid southwest, the SAR is ephemeral. Thus, there is sparse riparian vegetation in the invert consisting of willow and mulefat scrubs. After construction of the original levees, construction and operation of upstream wastewater treatment plants resulted in discharge of treated wastewater into the SAR resulting in perennial low flows through the project reach. As a result, wetlands are present along the fringes of the low-flow channel. Furthermore, to avoid impacts to the SAS, RCFD does not mow or in any way alter the riparian vegetation within 20 feet of the low-flow channel. Thus, a mature riparian corridor is present along the low-flow channel.

Construction (Direct):

Where the low-flow channel is impinged against the levee toes within the footprint of the TCF, in-channel construction would require diversion of the low-flow channel into a newly dug diversion in the center of the river divert low flows away from the levee. Once dewatered, the area adjacent to the levee including the dewatered low-flow channel would be excavated to the scour depth. Riparian vegetation would be removed and disposed in the uplands. Wetlands in the amount indicated in Table 2 would be removed.

The new low-flow diversion channel would be left in place after construction. Due to the perennial low flows and existing seed bank, riparian vegetation and hydric soils are expected to naturally reestablish over time. Overtime, all functions and services associated with the riparian corridor such as foraging, nesting, or predation avoidance would be fully restored.

In general, the fortified design would provide an increased level of protection against erosion at the toe of the levee due to the migration of the low-flow channel against the levee toes. Thus, the need to periodically move the low-flow channel away from the levee toes is expected to decrease. Since rerouting the low-flow channel removes wetlands present along its fringe, a decrease in the need to reroute the low-flow channel would provide long term benefits to wetlands.

Construction (Indirect):

As discussed above, removal of wetlands within the TCF would affect wildlife including species protected under the Endangered Species Act.

Operation (Direct & Indirect):

Typical O&M activities entail annual vegetation management. Structural repairs may be undertaken on as needed basis. Annual vegetation management activities would be limited to vegetation located on the dry riverbed. Furthermore, a 20-foot buffer along the low-flow channel would be avoided allowing for preservation of the mature riparian habitat. Thus, mowing operations would not impact wetlands.

Periodic structural repairs would occur on an emergency or non-emergency basis. In general, the fortified design is also expected to provide an increased level of protection against erosion at the toe of the levee, reducing the potential need for future structural maintenance and repair activities in repaired portions of the levee. Reduced maintenance and repair frequency is expected to translate to a reduced potential for future impacts to wetlands

Emergency repairs would likely occur during full storm flows or receding flows. In such instances, rocks maybe discharged to protect damaged levees.

Non-emergency structural repairs would likely occur outside the storm season with opportunities to divert low flows away from the work site. In such instances, potential impacts would be like those characterized under construction. However, the scale would be substantially smaller since repairs would be limited to specific areas of the levee where damages have occurred.

Mudflats

Construction (Direct & Indirect): Mudflats are generally found in intertidal, estuarine or near-shore habitats, in deltas, or at river mouths. None of these conditions occur in the Proposed Project Area. The proposed discharge would not directly or indirectly affect mudflats.

Operation (Direct & Indirect): Operations and maintenance activities would not directly or indirectly affect mudflats.

Vegetated Shallows

Construction (Direct & Indirect): Vegetated shallows are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as sea grasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems. Vegetated shallows are not present in the Proposed Project Area. The proposed discharge would not directly or indirectly affect mudflats.

Operation (Direct & Indirect): Operations and maintenance activities would not directly or indirectly affect vegetated shallows.

Coral Reefs

Construction (Direct & Indirect): Coral reefs consist of skeletal deposits, usually of calcareous or silicaceous materials, and occur in marine environments, which does not exist in the Proposed Project Area. Therefore, there would be no direct or indirect effects to coral reefs.

Operation (Direct & Indirect): As no coral reefs are present or will result from construction of restoration features, operations and maintenance activities would not directly or indirectly affect coral reefs.

Riffle and Pool Complexes

Steep gradient sections of streams are sometimes characterized by riffle and pool complexes. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. Although this habitat type is generally associated with higher-gradient streams, some form of riffle and pool complex may occur where boulders and gravel have accumulated to the extent that they can back up flows to cause pools and allow for increased water velocity or formation of eddies on the downstream side.

Construction (Direct & Indirect): Due to the shallow gradient of the SAR through the project area, there are no notable riffle and pool complexes in the river or in the low-flow channels. Thus, construction would not directly or indirectly affect riffle and pool complexes.

Operation (Direct & Indirect): Operations and maintenance activities would not directly or indirectly affect riffle and pool complexes.

7.4 Potential Direct and Indirect Effects on Human Use Characteristics (Subpart F)

Municipal and private water supplies

There are no municipal or private water wells, recharge areas, or intake structures related to water supplies within the reach of the SAR where construction would occur.

Construction (Direct & Indirect):

Construction activities would not affect the municipal or private water supply supplies.

Operation (Direct & Indirect): Operations and maintenance activities would not directly or indirectly affect municipal and private water supplies.

Recreational and Commercial Fisheries

Construction (Direct & Indirect): There are no commercial or recreational fisheries within the SAR where construction would occur. There would be no direct or indirect impacts.

Operation (Direct & Indirect): Operations and maintenance activities would not directly or indirectly affect recreational fishing.

Water-Related Recreation

Construction (Direct & Indirect):

There are no water-related recreation activities or facilities in the reach of the SAR through the Proposed Project Area. Construction would not directly or indirectly affect water-related recreation.

Operation (Direct & Indirect):

There are no water-related recreation activities or facilities in the reach of the SAR through the Proposed Project Area. Operations and maintenance activities would not directly or indirectly affect water-related recreation.

Aesthetics

Existing views of the SAR from the middle of the channel facing upstream or downstream consists of a linear waterway bordered by engineered levees to the left and right. The invert consists of beige and brown hues reflective of the alluvial substrate. Superimposed against this homogenous geometric background are braided low-flow channels both historic and active. The braided system supports riparian vegetation consisting of heterogeneous forms and textures as well as a natural color palette associated with a vegetated.

Construction (Direct & Indirect):

Construction would entail earthmoving activities that would remove vegetation within the construction TCF. A limited number of earthmoving equipment with highly visible paint schemes and colors would be temporarily present in the invert. The TCF would be temporarily devoid of heterogeneous forms and textures as well as a natural color palette associated vegetation and replaced with a homogeneous earthen vista with various hues of beige and brown. Upon completion of earthwork all construction equipment and materials would be removed. The TCF would remain temporarily barren and would form a distinct rectangular imprint in the vista. However, vegetation is expected to naturally reestablish in the area. Furthermore, migration of low flows channels across the TCF would restore the braided low-flow channels. Thus, construction would result in temporary impacts to aesthetics. However, vista within the TCF would match the surrounding vista over time.

Parks, national and historical monuments, national seashores, wilderness areas, and research sites

These preserves consist of areas designated under Federal and State laws or local ordinances to be managed for their aesthetic, educational, historical, recreational, or scientific value. 40 CFR 230.54.

Construction (Direct & Indirect):

There are no national and historical monuments or national seashores in the reach of the SAR through the Proposed Project Area. There would be no direct or indirect construction impacts.

Operation (Direct & Indirect): There are no national and historical monuments or national seashores in the reach of the SAR through the Proposed Project Area. There would be no direct or indirect operation and maintenance impacts.

7.4 Cumulative Impacts

Past

Construction of the Riverside Levees began in 1957 and was completed in 1959. Subsequent to completion, construction and modifications of road crossings likely resulted permanent discharges of fill for bridge abutments and piers. For example, the levees were altered in 1962 to accommodate State Route 60 (SR 60). In 1998, segments of the levee beneath the SR 60 Bridge were modified to accommodate a bridge widening project.

In the first few decades after completion of construction, RCFCD likely kept the channel clear of all vegetation on an occasional basis since the ephemeral flow regime likely allowed for sparse vegetation in the river. Vegetation maintenance activities likely resulted in discharge of in-situ soil in for the form bulldozer sidecast. In addition, structural repair of levees likely resulted in discharges of soil and rock. Impacts to aquatic functions and services were likely minimal due to the ephemeral flow regime.

In the subsequent years, construction and operation of upstream wastewater treatment plants resulted in discharge of treated wastewater into the SAR resulting in perennial low flows through the project reach. The perennial low flows fostered robust growth of riparian vegetation along the low-flow channel and increased functions and services of WoUS: ground water recharge and habitat for wildlife and federally protected species such as the LBV or the SAS.

Current RCFCD vegetation maintenance practices avoid the areas within 20 feet of the low-flow channel. Use of tracked skid-steer mowers likely result in minor discharges fill. However, due to the avoidance of the low-flow channel, there are no discernable impacts to aquatic functions and services.

Management of the perennial low-flow channel is a period but on-going activity. The Riverside Levees are constructed of compacted earthen fill overlaid with ungrouted rocks. When the low-flow channel migrates against the levee toes, the possibility of levee toes eroding increases. To avoid and minimize erosion, the RCFCD constructed 31 stone groins between 1994 and 1996 to train flows towards the center of the river. Each groin extends from the lower face of the levee and toe approximately 100 feet toward the low-flow channel and is approximately 8 feet high and 48 feet wide. The entirety of all groins is located within WoUS resulting in losses of approximately 3.3 acres of WoUS. When low-flows do impinge against the levee and causes erosion requiring immediate corrective actions, RCFCD has to move the flows away from the levee and retrain it towards the centerline of the river.

RCFCD also conducts structural repairs as needed for damages related to storm flows. Review of available Section 404 Clean Water Act Permits indicate that most activities are associated with management of the low-flow channel and repair or erosion protection of levee toes.

Table 3. List of Section 404 CWA Regulatory Actions in the Project Area.

Permit No.	Permit Type	Activity
94-00051-RRS	Special Individual Permit	Construction of 24 groins
94-00051-RRS	Permit Modification	Construction of 7 additional groins
200400155-JPL	RGP 63	Low-flow channel realignment
200500571-JPL	RGP 63	Groin repair
SPL-2007-290-DPS	NW 31	Levee toe protection
SPL-2010-00835-RJV	RGP 63	Low-flow channel realignment

Present

RCFCD continues to conduct annual vegetation maintenance. Structural repairs are implemented as needed to repair storm damages to both the levees and the groins, resulting in discharges of soil and rocks. Management of the perennial low-flow channel is conducted as needed.

The project area is located within Reach 3 of the SARWQCB's Basin Plan. Consistent with the surrounding urban land uses, Reach 3 is on the Clean Water Act Section 303(d) of Impaired Waters list due to high levels of bacteria, lead, and copper. Furthermore, with development of the uplands, vegetation and the low-flow channel continue to be an important resource for wildlife.

Future

After the Riverside Levees are fortified, a decrease in the need for structural maintenance and relocation of the low-flow channel is expected. Thus, discharges associated with these activities as well as temporary impacts to aquatic services and functions are likely to decrease. Furthermore, removal of 18 groins would restore approximately 2 acres of WoUS.

RCFCD is likely to undertake a levee rehabilitation project similar to the proposed action for non-federal levees that are continuous with the Riverside Levees. The design, construction, and environmental impacts of the levee rehabilitation project are likely to be similar to those associated with the proposed action.

RCFCD will continue to conduct annual vegetation maintenance. Structural repairs are implemented as needed to repair storm damages. The levees would also be subject to future modifications associated with bridge and utility crossings.

Although RCFCD is responsible for O&M activities, USACE will continue to exercise permitting authorities pursuant to Section 404 of the Clean Water Act for discharges of

dredged or fill material within WoUS, and Section 408 of the Rivers and Harbors Act for modifications to federally-constructed structures. Continued receipt of Section 404 and Section 408 permits for the construction, modifications, and maintenance of existing and future infrastructure such as bridges and utilities are anticipated. These non-USACE projects may require issuances of Section 404 and Section 408 permits. With few exceptions, most projects are expected to be small in scope and limited to like-for-like repairs.

The County of Riverside is expected to widen Mission Boulevard and Market St. bridges over the SAR after the Riverside Levees Rehabilitation Project. Construction impacts associated with the project are likely to be localized and temporary like the proposed action.

8. EVALUATION AND TESTING (SUBPART G)

Proposed discharges of permanent fill consist of soil, rocks, or concrete. The fill materials are chemically inert and would not leach contaminants into the water column. Soils proposed for discharge are native to site, work within waters of the US would not introduce additional contaminants not already present within the native substrate. Rocks are chemically inert and would not leach contaminants into the water column. Concrete leachate temporarily increases pH levels of water during the curing process. However, low flows would not contact the grout during the curing process since water would be diverted around the construction area. At some point in the future after construction, low flows will migrate naturally against the levee toes. By that time, the grout will have fully cured and there would be no changes in pH levels. Per 40 C.F.R 230.60(a), testing is not required.

9. Measures to Minimize Adverse Impacts (SUBPART H)

BR-1: Prior to construction, the construction limits will be clearly marked with high visible markers or barriers. Construction personnel will strictly limit their activities, vehicles, equipment, and construction materials to within the confines designated construction limits. The construction area(s) will be the minimal area necessary to complete the Proposed Project and will be specified in the construction plans.

BR-2: A biologist/environmental monitor will monitor construction activities to ensure compliance with environmental commitments and any permit requirements associated with the Project.

BR-3: Prior to construction activities, the biologist/environmental monitor shall conduct pre-construction environmental training for all construction crew members. The training shall focus on required avoidance/minimization measures and conditions of regulatory agency

permits and approvals. The training shall also include a summary of sensitive species and habitats potentially present within and adjacent to the Project Area.

BR-4: Dust control measures will be implemented during the construction phase to reduce excessive dust emissions. Methods for reducing dust emissions may include wetting work areas by water truck on a regular basis such as dirt access roads and sediment stockpiles, as well as covering truck beds carrying material and stockpiles.

BR-5: Prior to any ground-disturbing activities (*e.g.*, mechanized clearing or rough grading) for all Project related construction activities, the biologist/environmental monitor shall conduct pre-construction surveys of the Project Area for federally protected species.

BR-6: Upon construction completion, areas disturbed due to construction outside of the required levee maintenance zone will be re-vegetated with a combination of plantings and native hydroseed mix approved by the Corps. Replanted areas will be temporarily monitored and maintained to ensure the successful establishment of vegetation. Expected monitoring and maintenance activities include removal of invasive vegetation and supplemental watering, if necessary.

BR-7: All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other toxic substances will occur in developed or designated non-sensitive upland areas. These areas will implement best management practices to prevent runoff carrying toxic substances from entering the Santa Ana River and associated drainages. If a spill occurs outside of a designated area, the cleanup will be immediate and documented.

BR-8: Fire suppression equipment including shovels, water, and extinguishers will be available onsite during the fire season (as determined by Riverside County Fire Department) and when activities may produce sparks. Emergency contacts for the CAL FIRE Riverside Department Station No. 38 on Mission Blvd. and the Riverside City Fire Station #6 on Orange St. will be established.

BR-9: To the extent feasible, the contractor will prevent exotic weeds from establishing within the work site during construction. Construction equipment will be cleaned of mud or other debris prior to mobilizing and before leaving the site to reduce the potential spread of invasive plants and/or seeds.

BR-10: Prior to construction, additional surveys will be performed for SAWS within areas that will be disturbed or de-vegetated for construction and provide appropriate habitat conditions for SAWS. Based on the number of locations to be disturbed and the number of

SAWS identified, a plan will be developed to collect and store seeds for replanting. This plan will be developed by USACE in coordination with RCFCWCD and USFWS. The plan shall include details on: (1) methods for seed collection and number of seeds to be collected, (2) methods and location for seed storage, and (3) methods and timing for seed planting, including requirements to plant seeds across multiple seasons.

BR-11: All vegetation required to be cleared to facilitate construction that could support LBV will be removed outside of the LBV nesting season (March 15 – August 15).

BR-12: From (March 15 – August 15), the construction contractor will be required to monitor noise regularly in habitat adjacent to ongoing construction activities. The Contractor must ensure that noise levels in the adjacent habitat do not exceed 60 decibels (A-Weighted - dbA) if ambient noise measurements are less than 60 dbA; or noise levels do not increase by more than 5 dbA above ambient if ambient measurements exceed 60 dbA. This may be accomplished by modifying construction schedules to avoid working within 500 feet of riparian habitat during the nesting season and/or modifying equipment or procedures.

BR-13: Construction required to divert the low-flow channel away from the construction site will occur from September 16 – February 28, a period of time outside of the SAS breeding season (Mar – June) and the riparian nesting bird season (March 15 – September 15). Segments supporting, or in close proximity to SAS breeding habitat would be diverted prior to March (*i.e.*, Left Levee diversion channel). River diversions will be performed in coordination with a biologist knowledgeable of SAS habitat requirements.

BR-14: Prior to performing work in the active channel of the Santa Ana River, any SAS within the work area will be relocated. Passive techniques will be utilized initially (*i.e.*, flushing), and active relocation (*i.e.*, capture and relocation) would be used only as the last resort. If active relocations are required, relocations will be performed under the guidance of a qualified biologist permitted to handle SAS. Following the relocation of SAS from the area of construction, exclusionary methods will be implemented to ensure SAS do not recolonize the area prior to channel diversion.

BR-15: To avoid and reduce impacts to SAS, the contractor will construct a temporary earthen berm on the inside edge of the construction area where the Project Area is at risk of flooding by the main channel of the Santa Ana River. The purpose of the berm is to reduce the likelihood of channel flows entering the Project Area during a storm event, thus avoiding impacts to SAS by exclusion from the Project Area. The berm will be constructed of fill material either from onsite grading activities or from the borrow area. The contractor will be responsible for designing the berm, and the Corps will review and approve the berm design prior to construction. If the berm fails and channel flows enter the Project Area, all work in the flooded area will cease until a qualified biological monitor confirms with the Corps that

work can recommence. The Corps will coordinate with USFWS prior to allowing construction to recommence. The decision to restart will be based on the following:

- Assessment of SAS presence within the Project Area, via surveys employing techniques such as snorkel, block nets, and electro-fishing,
- Removal of fish present, and
- Lack of channel flows entering the Project Area within the foreseeable immediate future.

BR-16: Routine maintenance activities will be conducted each year outside of the riparian nesting bird season of March 15th to September 15th.

BR-17: Mowing will be conducted in a manner that does not disturb the root system. The acreage and location of mowing areas will vary annually in order to allow for vegetation regrowth, avoidance of the low-flow channel by a minimum of 20 feet from the bank, avoidance of areas with sparse vegetation, and avoidance of areas occupied by SAWS. Mowing will be conducted in a manner that avoids discharging fill material into waters of the U.S.

BR-18: Prior to maintenance mowing of the channel, surveys for the SAWS will be completed in the areas identified for mowing to ensure that SAWS populations are avoided.

CR-1: In the event that historical or archaeological resources are uncovered during construction, the USACE archaeologist would be notified within 24 hours. All work will be suspended within 50 ft. of the discovery. USACE shall follow the steps outlined in 36 CFR 800.13, post review discoveries. This would include coordination with the California State Historic Preservation Officer, the Advisory Council on Historic Preservation, and appropriate Indian Tribes or Native American groups and/or other interested parties.

HW-1: Comply with NPDES regulations implemented by the Santa Ana Regional Water Quality Control Board for dewatering activities.

HW-2: Establish staging and refueling areas outside the Santa Ana River.

HW-3: Prepare and implement a Spill Prevention and Response Plan.

REC-1: Coordinate the design and alignments for detours of the Santa Ana River Trail with Riverside County Regional Park and Open-Space District and the City of Riverside.

REC-2: Post signage on both ends of the trail detours to alert approaching trail users to the detours.

REC-3: Post flagmen on both ends of the trail detours during hours of construction to alert approaching trail users to the detours.

WQ-1: Implement all applicable terms and conditions of the Section 401 Water Quality Certification.

WQ-2: Implement all applicable terms and conditions of the Section 402 NPDES General De Minimis permit (Order No. R8-2020-0006).

WQ-3: Ensure compliance with Section 404 CWA. Implement all avoidance and minimization measures.

WQ-4: Develop and implement water quality monitoring during construction for basic physical parameters such turbidity, pH, and temperature.