3.8 Cultural Resources

3.8.1 Regulatory Setting

"Cultural resources" as used in this document refers to all "built environment" resources (structures, bridges, railroads, water conveyance systems, etc.), culturally important resources, and archaeological resources (both prehistoric and historic), regardless of significance. Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act of 1966, as amended, (NHPA) sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places. Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 CFR 800). On January 1, 2004, a Section 106 Programmatic Agreement (PA) between the Advisory Council, FHWA, State Historic Preservation Officer (SHPO), and the Department went into effect for Department projects, both state and local, with FHWA involvement. The PA implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to the Department. The FHWA's responsibilities under the PA have been assigned to the Department as part of the Surface Transportation Project Delivery Pilot Program (23 CFR 327) (July 1, 2007).

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties. See Appendix B for specific information regarding Section 4(f).

Historical resources are considered under the CEQA, as well as California Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources. PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet National Register of Historic Places listing criteria. It further specifically requires the Department to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the SHPO before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for

inclusion in the National Register or are registered or eligible for registration as California Historical Landmarks.

3.8.2 Affected Environment

The analysis of the potential for the project to impact cultural resources is documented in the *Historic Property Survey Report* (HPSR) (2010), the *Historical Resources Evaluation Report* (HRER) (2010), the *Archaeological Survey Report* (ASR) (2010), the *Supplemental Historic Property Survey Report* (Supplemental HPSR) (2011), and the *Finding of No Adverse Effect for State Route 91 Corridor Improvement Project* (FNAE) (2011).

The findings of those reports are summarized in this section.

3.8.2.1 Area of Potential Effects

The Area of Potential Effects (APE) for the project defines the geographic area within which the Build Alternatives have the potential to directly or indirectly affect historic properties, if such properties are present. The APE boundary is the maximum extent of all potential direct and indirect project impacts on cultural resources. The APE for the project contains approximately 2,107 ac along and adjacent to the project segments of SR-91 and I-15. The APE was outlined based on the maximum disturbance limits anticipated for the combined Build Alternatives.

Definition of an APE is influenced by the scale and nature of a specific proposed project and may be different for different kinds of effects. Consistent with Department policy, the area of direct effects is based on the horizontal and vertical extents of anticipated project-related, ground-disturbing activities, including permanent and temporary project impacts (California Department of Transportation [Caltrans] *Standard Environmental Reference*, Volume 2, Chapter 4, Section 3). The area of direct effects in the APE for the project contains approximately 941 ac. The area of indirect effects refers to the area of potential effects of the project on cultural resources outside the area of direct effects. The area of indirect effects for the project consists of approximately 1,166 ac. Indirect effects occur beyond the area of direct effects and can include visual, noise, atmospheric, or shadow effects; vibration from construction activities; or changes in access to or use of a cultural resource.

3.8.2.2 Records Search

Records searches for the project were conducted at the following locations:

- San Bernardino Archaeological Information Center (February 11, 2008)
- South Central Coastal Information Center (February 12 and 13, 2008)
- Eastern Information Center (February 21 and 22, 2008)

Other sources consulted are listed in Table 3.8.1.

Table 3.8.1 Sources Consulted During the Records Search

Sources
• National Register of Historic Places
• California Register of Historical Resources
• California Inventory of Historic Resources
• California Historical Landmarks
• California Points of Historical Interest
• State Historic Resources Commission
• Caltrans Statewide Historic Bridge Inventory
• City of Riverside Building and Safety Division, building permits accessed online, August and November 2008
• City of Corona Community Development Department (contacted in person, by telephone, and via email in 2008 and 2009; and by letter dated August 19, 2011)
• City of Corona Building and Safety Division, building permits on microfiche, August and November 2008, and July and November 2009
• Los Angeles Public Library, various newspaper and map archives accessed online, June–November 2008
• A.K. Smiley Public Library, Heritage Room, Redlands, October 2008
• Riverside Public Library, Local Heritage Room, Riverside, June–August 2008
• Corona Public Library, Heritage Room, Corona, June–August and November 2008
• Anaheim Public Library, August 2008
• Anaheim Heritage Reading Room at the Muzeo, Anaheim, August 2008
• Orange County Archives, Santa Ana, August 2008
• USGS topographic maps
• Riverside Historical Society (letter mailed August 18, 2008; no response received)
• Riverside County Historical Commission (letter mailed August 18, 2008; no response received)
• Corona Historic Preservation Society (letter August 18, 2008; letter August 19, 2011; and in person and by phone in August 2011)
• Norco Historical Society (letter mailed August 18, 2008; voicemail response regarding general questions; voice message left in response; no subsequent response)
• Anaheim Historical Society (letter mailed August 18, 2008; no response received)
• Pioneer Historical Society of Riverside (letter mailed August 18, 2008; no response received)
• Orange County Historical Society (letter mailed August 18, 2008; no response received)
• Personal communication with Charlie Brown, Star Ranch Foreman, Mindeman Ranch Road, April 30, 2008
• Personal communication with golf course architect Cary Bickler, ASGCA, via email on July 17, 2008
• Personal communication with Larry Deville, long-time Corona resident, August 14, 2008
• Email correspondence with the California African American Museum, August 2008 (no response received)

ASGCA = American Society of Golf Course Architects USGS = United States Geological Survey
Caltrans = California Department of Transportation

3.8.2.3 Survey Methods

Architectural Survey Methods

Multiple field surveys were conducted between April and December 2008. Reconnaissance-level (windshield) field surveys were conducted in the entire APE on April 11 and 29, June 24, July 14 and 16, August 4 and 5, and October 23 and 24, 2008. Intensive surveys of specific properties were conducted in the APE on August 13, 14, and 22, October 28 and 30, and November 14, 2008, and on January 6, July 15 and 22, and November 20, 2009.

Each building in the APE that could be seen from the public right-of-way, and in some cases from private driveways, was observed. During the surveys, notes regarding the apparent age and integrity of each building were made on field maps. In addition, notes were made regarding the location, type, and condition of all buildings that appeared to be 45 years of age or older and photographs were taken of some buildings. Consistent with general cultural resources practices and to account for the typical period of time between the preparation of the HPSR and actual project construction, buildings 45 years of age or older (rather than 50 years of age or older) were considered. All previously recorded architectural resources in the APE were also identified and their current conditions were noted. In some cases, previously recorded buildings no longer exist.

Based on the reconnaissance-level surveys and basic property-specific research, the majority of buildings in the APE were determined to meet the criteria for classification under Property Types 2–4 and 6, as defined in Attachment 4 (Properties Exempt from Evaluation) of the Section 106 PA, and therefore were not further documented. Most of the buildings that were found to be exempt were modern, substantially altered, or mobile homes.

During the intensive field surveys, the architectural historian walked along the public right-of-way and photographed and made detailed notes of each building's structural and architectural characteristics, current conditions, setting, and associated features. In some cases, property owners allowed the architectural historian access to their properties so a more thorough survey could be completed. When possible, owners and area residents were interviewed to obtain more detailed information about the buildings and the development of the area.

Archaeological Survey Methods

The archaeological field survey examined all areas that could potentially be directly affected by the Build Alternatives. Generally, this was limited to the existing State and public rights-of-way, areas for the new interchanges, and improvements to frontage roads. Those field surveys were conducted on April 29 and 30, June 26, and November 5, 2008, and on July 29, 2009. The vast majority of the public rights-of-way is completely disturbed by previous construction of roads, bridges, on- and off-ramps, buildings, and associated features such as underground water and natural gas lines. However, small areas in the rights-of-way, which include undisturbed ground surface with potential to contain intact cultural deposits, were systematically surveyed by intensively examining the ground surface at a maximum transect width of 15 ft. Areas previously surveyed for the Eastbound SR-91 Lane Addition Project from SR-241 to SR-71 were not resurveyed for this study.

3.8.2.4 Native American Consultation

On May 8, 2008, Native American consultation was initiated on behalf of the Department when a letter requesting a search of the Sacred Lands File (SLF) for the APE and areas in the vicinity of the APE was sent to the NAHC. The NAHC replied on May 21, 2008, stating that the SLF indicated the presence of Native American cultural resources in both the APE and areas in the vicinity of the APE and recommended contacting nine Native American Tribes, groups, and individuals.

A letter mailed to the nine Native American Tribes, groups, and individuals on June 3, 2008 discussed the project and requested information on Native American cultural resources. The letter also discussed four previously destroyed sites (three prehistoric, one historic) that are documented in the vicinity of the APE. One letter response received June 10, 2008, from the Soboba Band of Luiseño Indians requested further consultation and cultural resources documentation. No other responses to the June 3, 2008 letter were received.

On June 30, 2008, all nine Native American Tribes, groups, and individuals were contacted by telephone and/or email. A representative from the Gabrieleno/Tongva San Gabriel Band of Mission Indians requested monitoring by a Native American and an archaeologist during construction. A representative from the Juaneño Band of Cahuilla Mission Indians also requested monitoring by a Native American and that the Tribe be notified of any cultural resources discoveries.

In an August 20, 2008, letter, a Pechanga Band of Mission Indians representative requested the opportunity to participate in the environmental review process, copies of archaeological reports and other documentation, additional consultation, participation in all archaeological surveys and excavations through Tribal monitoring, and participation in decisions pertaining to the development of the project APE.

In response to requests from the Pechanga Tribe, the Department proposed that the HPSR and ASR be updated to include language about Native American monitoring in areas that the Pechanga Tribe considers sensitive and to state that the actual monitoring locations would be finalized during the Plans, Specifications, and Estimates (PS&E) phase of the project. On July 23, 2010, the Pechanga Tribe provided comments on the HPSR and ASR to the Department. Those comments were incorporated in the Final HPSR and ASR.

As requested by a representative of the Pechanga Band of Mission Indians during the Native American consultation process, during final design, RCTC's Project Manager will coordinate with the Pechanga Tribe to identify locations considered sensitive by the Tribe that will be shown on the project specifications as areas where Native American monitoring will be required during grading and other soil disturbance activities. RCTC's Project Engineer will include those areas on the project specifications.

Additional consultation was conducted with the two Tribal representatives who requested monitoring by a Native American and/or an archaeologist during construction. The representatives from the Juaneño Band of Cahuilla Mission Indians and the Gabrieleno/Tongva San Gabriel Band of Mission Indians modified their initial responses to recommend monitoring if cultural resources are encountered during construction and to request notification of any discoveries. The representative for the Gabrieleno/Tongva San Gabriel Band of Mission Indians also stated that while he does not know of any specific cultural resources in the APE that could be impacted, he does consider the project area to be an "…area of concern…" due to its proximity to the Santa Ana River. Section 5.5, Native American Consultation and Coordination, provides additional discussion of these consultation and coordination activities.

3.8.2.5 Consultation with the Corona Historic Preservation Society

On June 14, 2011, follow-up outreach was conducted with the Corona Historic Preservation Society (Preservation Society). On June 16, 2011, the Preservation

Society responded that they had been working on nominating the Grand Boulevard Historic District to the National Register of Historic Places (National Register) and that on May 19, 2011, the Historic District was officially approved as a California Landmark by the State Historical Resources Commission and the nomination was forwarded for consideration to be placed on the National Register. On August 19, 2011, a letter was mailed and sent via email to the Preservation Society soliciting comments regarding the Grand Boulevard Historic District and the potential effects the SR-91 CIP Build Alternatives might have on that resource. On August 24, 2011, Mr. Richard Winn of the Preservation Society responded by telephone and indicated that he would like to review the Finding of Effect (FOE) as soon as it is available.

On August 26, 2011, Mr. Winn reviewed the draft FOE. He asked where the streetlights would be stored during construction and suggested Corona Heritage Park as a possible location for the temporary storage of the streetlights displaced by the project. He agreed that the proposed project would not have an adverse effect on the Grand Boulevard Historic District, but indicated that he would present his recommendations to the Preservation Society Board and provide a letter response. Later in the day on August 26, 2011, Mr. Winn indicated he had spoken to the Board, and a letter dated August 25, 2011 was provided that indicated the Preservation Society is supportive of the project but is concerned about the protection of the streetlights. Based on the preliminary project design, up to seven of the historic-period acorn-style streetlights may be relocated. These include two that are located within proposed intersections and will need to be relocated at least 30 feet from their present locations and five that are located under the overcrossings. It is currently proposed to leave those five lights in place because the vertical and horizontal clearances are expected to be sufficient at these locations to accommodate them. However, for this analysis up to 7 of the streetlights were considered for relocation. The Preservation Society recommended storing any streetlights that would be relocated (up to 7) in a secure location during construction and suggested they may be able to provide such a location. The condition provided in Section VI of the FOE and discussed later in Section 3.8.4, Avoidance, Minimization, and/or Mitigation Measures, addresses this concern.

The Preservation Society also expressed concern about the removal of mature trees from the parkway. However, as explained to Mr. Winn during the meeting on August 26, 2011, none of the trees anticipated to be removed date to the period of significance associated with the Grand Boulevard Historic District. A copy of the

Society's letter dated August 25, 2011, is provided in Appendix M, Section 106 Consultation.

3.8.2.6 Results

Results of the Records Searches and Field Surveys

The intent of the records searches, archival research, studies described above, and the current survey was to identify prehistoric and historic cultural resources in the APE that may be eligible for listing in the National Register or may be considered a historical resource under CEQA. The records searches and field surveys resulted in the identification of 28 resources that are summarized in Table 3.8.2. Table 3.8.2 shows that two previously unrecorded prehistoric archaeological sites (items 1 and 2) and one previously recorded built environment resource (item 4) no longer exist. The remaining previously recorded site (item 3 in Table 3.8.2) was determined not to be eligible for the National Register on March 8, 2001. On September 20, 2010, SHPO concurred that items 6 through 28 were not eligible to be listed on the National Register.

As shown in Table 3.8.2, the other cultural resources identified within the APE (items 5 through 28) during the project surveys were either evaluated and determined not to be historically significant or were exempted under the Department's Section 106 PA.

Item number 5 on Table 3.8.2, the Grand Boulevard Historic District, was listed on the National Register on July 14, 2011. It is the only historic property that will potentially be impacted by the project and is described in detail below.

Grand Boulevard Historic District

The Grand Boulevard Historic District is in the City of Corona. It became a California Historical Landmark on May 19, 2011, and was listed on the National Register on July 14, 2011. The Historic District qualified for listing on the National Register because it is a *property that is associated with events that have made a significant contribution to the broad patterns of our history* (National Register Criterion A) and is a *property that embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction* (National Register Criterion C).

Table 3.8.2 Cultural Resources Identified by the Records Searches, Standard Research, and the Surveys as in the APE for the SR-91 CIP

	Resource	Status
	Resources Previously Recorded/Evaluated	
1.	Prehistoric archaeological site 33-1438 (CA-RIV-1438), a bedrock milling site, was previously documented as having been destroyed.	The survey for the SR-91 CIP verified that the site is destroyed.
2.	Prehistoric archaeological site 33-1439 (CA-RIV-1439), a light lithic scatter/temporary camp site.	The site was not relocated during the survey for the SR-91 CIP. It has been destroyed by development.
3.	Historic archaeological site CA-RIV-6532H/33-10819/Green River Camp/Alta Vista Site.	The survey for the SR-91 CIP identified only Feature 6 as extant. Feature 6 is an unusually extensive complex of rock-and-mortar foundation walls, retaining walls, stairways, patio slabs, and other elements. The site was determined to be ineligible for the National Register on March 8, 2001.
4.	A built environment resource at 108 South Howard Street was previously documented as having been destroyed.	The survey for the SR-91 CIP verified that the resource is no longer extant.
	Resources Recorded/Evaluated in the SR-91 CIP	
5.	The built environment resource known as the Grand Boulevard Historic District was identified through standard research. The Historic District was designated locally (City of Corona). No DPR forms or other documentation for this resource were found.	The Corona Historic Preservation Society nominated the Grand Boulevard Historic District as a California Landmark. That designation was approved by the State Historical Resources Commission on May 19, 2011, and that nomination was forwarded for consideration of placement in the National Register. The Grand Boulevard Historic District was listed on the National Register on July 14, 2011.
6.	A built environment resource at 44 East Grand Boulevard was identified by the records search, but had not previously been evaluated.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
7.	A built environment resource at 115 North Victoria Avenue was identified by the records search, but had not previously been evaluated.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
8.	A built environment resource at 211 North Pearl Street was identified by the records search, but had not previously been evaluated.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
9.	A built environment resource at 215 North Pearl Street was identified by the records search, but had not previously been evaluated.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
10.	A built environment resource at 105 North Pearl Street was identified by the records search, but had not previously been evaluated.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
11.	A built environment resource at 2121 Mountain View Drive was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.

Table 3.8.2 Cultural Resources Identified by the Records Searches, Standard Research, and the Surveys as in the APE for the SR-91 CIP

	Resource	Status
12.	A built environment resource at 711 Butternut Lane was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
13.	A built environment resource at 711 Balsam Lane was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
14.	A built environment resource at 1811 Via Santiago was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
15.	A built environment resource at 1805 Via Santiago was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
16.	A built environment resource at 323 Smith Street was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
17.	A built environment resource at 128 South Vicentia Avenue was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
18.	A built environment resource at 112 School Street was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
19.	A built environment resource at 107 North Sheridan Street was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
20.	A built environment resource at 107 North Belle Avenue was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
21.	A built environment resource at 104 North Victoria Avenue was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
22.	A built environment resource at 203 South Victoria Avenue was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
23.	A built environment resource at 207 South Victoria Avenue was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department has determined this resource is not eligible for the National Register and is not a historical resource under CEQA.

Table 3.8.2 Cultural Resources Identified by the Records Searches, Standard Research, and the Surveys as in the APE for the SR-91 CIP

	Resource	Status
24.	A built environment resource at 416½ East Second Street was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
25.	A built environment resource at 204 South Joy Street was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
26.	A built environment resource at 2308 State Street was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
27.	A built environment resource at 2520 State Street was identified during the surveys for the SR-91 CIP.	The potential eligibility of this resource for the National Register was evaluated as part of the cultural resources studies for the SR-91 CIP. The Department determined this resource is not eligible for the National Register and is not a historical resource under CEQA.
28.	Fifty-eight bridges in the APE were listed in the Caltrans Statewide Historic Bridge Inventory (accessed online in June 2009).	All 58 are listed as Category 5 and are ineligible for listing in the National Register. The Department determined that the 58 bridges in the APE for the SR-91 CIP are not eligible for the National Register.

Source: *Historic Property Survey Report* (2010) and the *Supplemental Historic Property Survey Report* (2011).
APE = Area of Potential Effects
CA = California
Caltrans = California Department of Transportation
CEQA = California Environmental Quality Act
CIP = Corridor Improvement Project
Department = California Department of Transportation
DPR = Department of Parks and Recreation
ft = feet
HPSR = *Historic Property Survey Report*
National Register = National Register of Historic Places
RIV = Riverside County
SHPO = State Historic Preservation Officer
SR-91 = State Route 91

After the Historic District was listed on the National Register, the Department prepared a Supplemental HPSR and Finding of Effect in August 2011 to document the status change of the District to that of historic property and to assess the project effects on it.

Because it is listed in the National Register, it is an historic property as defined in Section 106. It is also listed in the California Register of Historical Resources (California Register) and is an historical resource for the purposes of CEQA. Refer to Chapter 4, California Environmental Quality Act Evaluation, for discussion of the Grand Boulevard Historic District as a historical resource under CEQA.

The Historic District is limited to the public right-of-way. Its primary character-defining feature is its circular design, which is 1 mi in diameter and was part of the original design of the Corona town site in 1886. The location of Grand Boulevard is shown on Figure 3.8-1. The distance around the circle is approximately 3 mi. The Historic District boundary is defined as the full length of the contiguous roadway, including the full 100 ft wide right-of-way (which includes the road, curb, parkways, and sidewalks) and the two adjacent pocket parks along the inner curve of the road at its intersections with Tenth Street at South Merrill Street and South Joy Street.

Contributing elements include features within the right-of-way associated with the original design concept, early development, or function of Grand Boulevard during the period of significance (1886-1928). Contributing features include the roadway, and its intersections with streets and alleys, driveways, gutters, curbs, parkways, street trees, acorn-style streetlights, sidewalks, a hitching post, and two pocket parks. None of the contributing features within the project APE are individually significant based on the National Register and the survey and evaluation work conducted for the SR-91 CIP.

Grand Boulevard rings a grid of equidistance-spaced interior streets and is intersected at its outer ring at various angles by exterior streets. The road itself is 60 ft wide with four through lanes and an intermittent center left-turn lane. In the northernmost segment, near the SR-91 bridges, the road was widened in 1976 to 80 ft, elevated, and restriped. Around Grand Boulevard, there are long stretches of turfed parkway that are generally 12 ft wide between the street curb and the nearby sidewalk. The parkway areas include street trees, streetlights, and one granite hitching post. The most intact segments are the inner and outer curves of the southern half of Grand Boulevard. The parkways under the SR-91 mainline were narrowed in 1961 and are

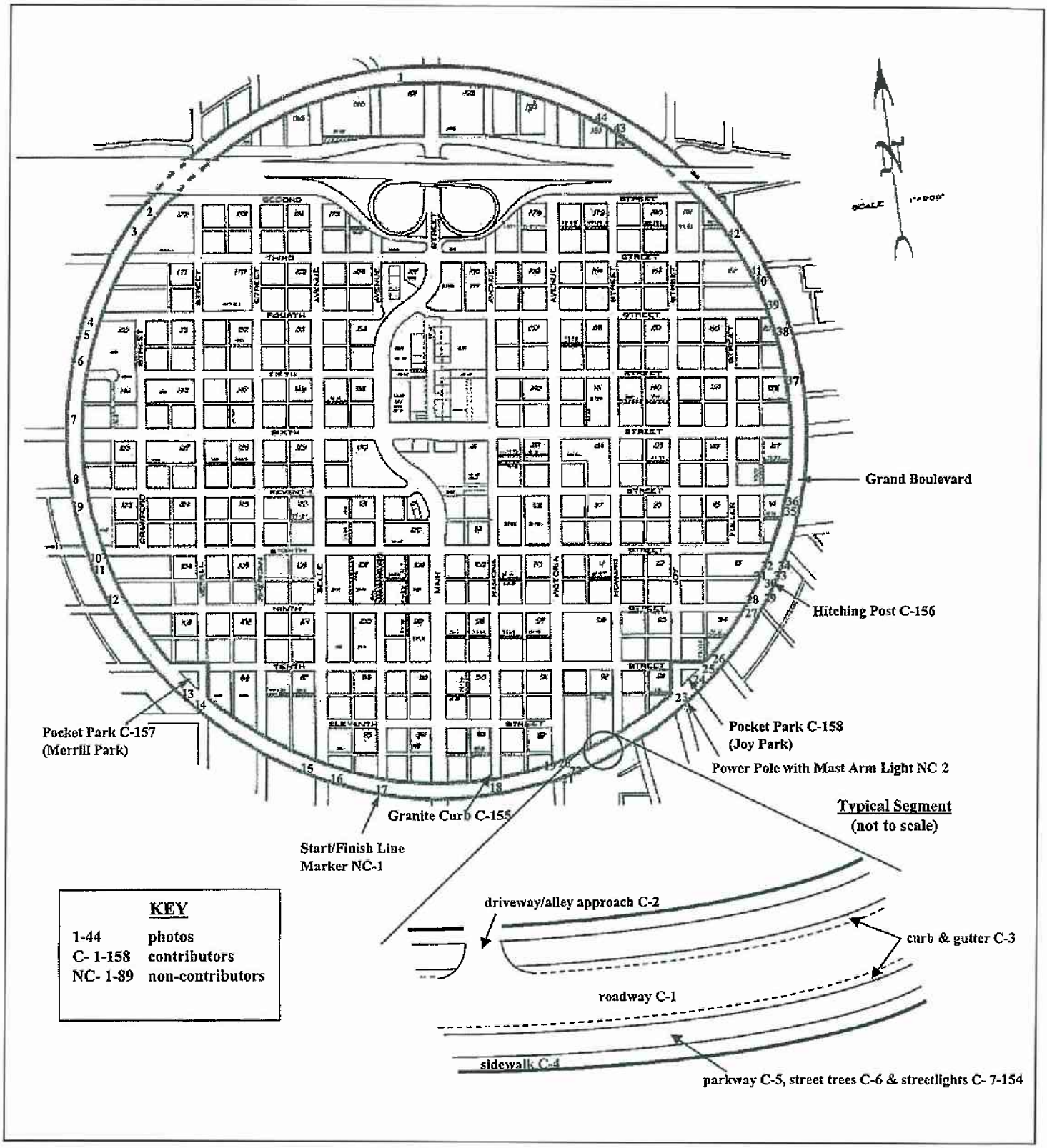

FIGURE 3.8-1
Sheet 2 of 2

SR-91 Corridor Improvement Project
Location of Grand Boulevard and
the Grand Boulevard Historic District

12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
EA 0F540

SOURCE: Grand Boulevard Historic District National Register Nomination

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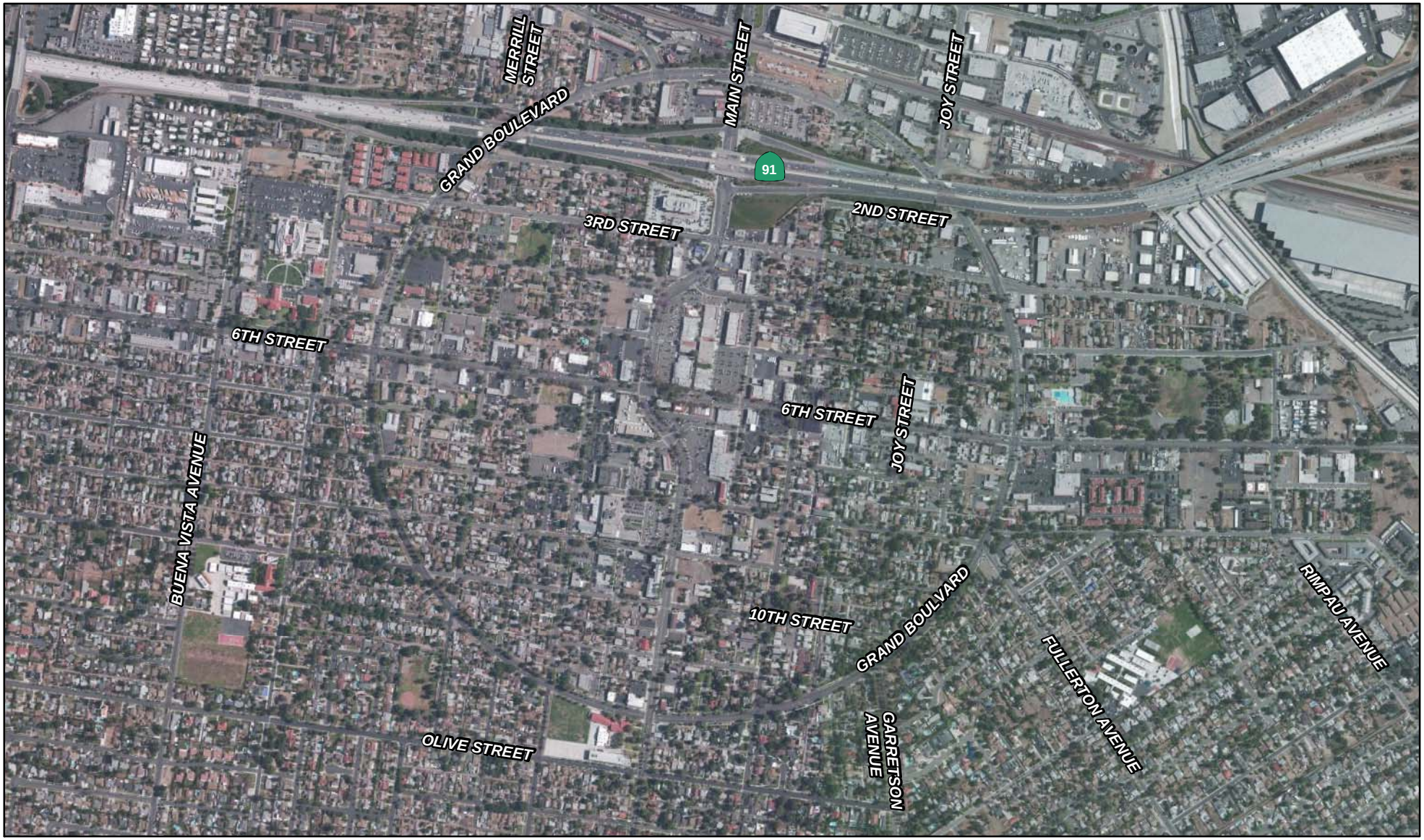

FIGURE 3.8-1
Sheet 1 of 2

SR-91 Corridor Improvement Project

Location of Grand Boulevard and the Grand Boulevard Historic District

12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
EA 0F540

0 500 1000
FEET

SOURCE: Bing Maps (c.2010)

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Sidewalks were completed in segments along Grand Boulevard from the late 1800s through the 1920s. Many segments of the original sidewalks have been narrowed or replaced, and handicapped access ramps have been added to the sidewalks along the entire length of Grand Boulevard.

Many early or original street trees line the inner and outer curves of Grand Boulevard. These street trees include palms, carob, eucalyptus, pepper, cypress, and magnolia. Trees are most consistent along the inner curve. There have been no trees in the northwest quadrant since 1961. Tree wells enclose mature trees and new plantings in a few locations and in part of the outer curve north of SR-91.

There are historic-period acorn-style streetlights throughout Grand Boulevard. Of the approximately 31 acorn-style streetlights that were originally located in the northern part of Grand Boulevard between West and East Third Streets, a total of 18 (58 percent) have been removed (10), relocated (3), or replaced in-kind (5).

Past modifications to Grand Boulevard include:

- Construction of SR-91 (1961),
- Construction of grade separation (1976),
- Realignment of Joy Street and Bollero Place intersections,
- Road resurfacing and restriping,
- Installation of traffic and pedestrian control signals and signage,
- Replacement of streetlights in-kind,
- Relocation, replacement, and removal of street trees, and
- Modifications to the parkways, curbs, and sidewalks.

In 1961, SR-91 was constructed, crossing the northern part of Grand Boulevard generally north of Second Street as shown on Figure 3.8-1. The width and configuration of Grand Boulevard were not changed by the construction of SR-91, but the parkways under and adjacent to the freeway were narrowed and the vegetation removed; some intersections were altered or removed; and the two northern pocket parks were removed. In 1976, a grade separation project elevated the northernmost segment of Grand Boulevard to meet North Main Street, which was reconstructed as a railroad overpass. That segment of the road was widened to accommodate the rising curve by adjusting the outer curve parkway width for approximately 150 ft on either side of the North Main Street intersection. Relocated historic Mexican fan palms and

new magnolias, and historic-period streetlights were retained and incorporated in the widened Grand Boulevard segment.

As discussed in the National Register nomination for the Grand Boulevard Historic District: "[M]aterials, workmanship and feeling have been somewhat compromised by repairs, maintenance, and replacement, and through the installation of State Route 91 bridges (1961) and grade separation project (1976) in the northernmost sliver." Even with the modifications described above, however, Grand Boulevard retains a high degree of integrity, with the location, design, and association of the circular boulevard intact. Feeling and setting permeate the district, although they are expressed less closer to SR-91, along the elevated road segment, and at the signalized intersections; and are more expressed along the southern half of the circle where there are two pocket parks and long segments of wide, turfed parkways with consistent streetlights and mature trees.

Location of the Project APE in the Grand Boulevard Historic District

The APE for the SR-91 Build Alternative includes the following two segments of the Grand Boulevard Historic District:

- An approximately 850 ft (0.16 mi) long segment of West Grand Boulevard between Second Street and North Sheridan Street
- An approximately 2,770 ft (0.52 mi) long segment of East Grand Boulevard from just west of North Main Street to just south of Third Street

3.8.2.7 Discovery of Cultural Materials or Human Remains

If cultural materials are discovered during construction, all earthmoving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered during construction, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains and the County Coroner shall be contacted. Pursuant to PRC Section 5097.98, if the remains are thought to be Native American, the Coroner will notify the NAHC, which will then notify the MLD. At that time, the Department's District 8 Environmental Branch Chief or the District 8 Native American Coordinator (Gary Jones, [909] 383-7505) will be contacted so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

3.8.3 Environmental Consequences

3.8.3.1 Summary of Impacts

The Initial Phases of Alternatives 1 and 2, including the Preferred Alternative 2f, would relocate small segments of sidewalks, curbs, and gutters; relocate up to 7 acorn-style streetlights; remove 18 street trees; and reconfigure 2 intersections. All the proposed modifications would occur in the northernmost part of the Grand Boulevard Circle. Overall, these are minor modifications to features that are either outside the period of significance for this Historic District or have already sustained alterations. The only contributing feature that will be impacted by the Build Alternatives are the seven historic-period streetlights. Alternatives 1 and 2 will not impact any other features that contribute to the significance of the Historic District. The integrity of location, design, and association will remain intact in the portion that will be modified by the project (i.e., the northern sliver) because the primary contributing features (the circular design and 100 ft width of Grand Boulevard) will be unaffected by the Initial Phases of Alternatives 1 and 2. Because Alternatives 1 and 2 will not alter characteristics that qualify the Grand Boulevard Historic District for the National Register in a manner that would diminish its integrity or impair its ability to convey its historic significance, it will result in No Adverse Effect to the District.

Sidewalks, Curbs, and Gutters

Alternatives 1 and 2 include removal and replacement of small segments of the existing sidewalks, curbs, and gutters within the northern sliver of the Grand Boulevard Historic District. Throughout the decades, minor modifications, including alterations to the parkways, sidewalks, and curbs have been made to Grand Boulevard. Two major projects in the northern segment in 1961 (construction of SR-91) and 1976 (grade separation and street widening) also modified features along Grand Boulevard. As a result of these modifications, the sidewalks, curbs, and gutters in the northern part of the Historic District are not character-defining features and do not contribute to the significance of the District. Therefore, any modifications to the sidewalks, curbs, and gutters by Alternatives 1 and 2 will not adversely affect the historic significance of the Grand Boulevard Historic District as a whole.

Streetlights

Up to seven of the acorn-style streetlights that are contributing features will be temporarily removed during construction. Prior to the conclusion of construction, the removed streetlights will be reinstalled as close as possible to the locations from which they were removed. The proper handling, storage, and reinstallation of the

streetlights in accordance with measures in Section 3.8.4.2 will adequately minimize the impact and limit it to a temporary duration.

Street Trees

On East Grand Boulevard, nine street trees (five north of the freeway bridge and four south of the bridge) will be removed during the construction of Alternatives 1 and 2. While trees are considered contributing features of the Historic District, the ones that will be removed are small, young, and do not appear to date to the period of significance. As a result, the removal of those nine trees will not adversely affect the historic significance of the Grand Boulevard Historic District. To avoid further degrading the integrity of this segment of the Historic District, prior to completion of the construction, replacement trees will be selected from the following species which are all compatible with the Historic District: palms, carob, eucalyptus, pepper, cypress, and magnolia and will be planted at a 1:1 ratio in the Historic District; refer to Measure CR-1 later in this section for the specific commitments included in Alternatives 1 and 2 regarding replacement of the nine trees removed in the Historic District during construction of the project.

Intersections

Alternatives 1 and 2 include reconfiguration of two previously modified intersections (Bollero Place/Frontage Road and Joy Street). Because these intersections do not date to the period of significance for the Historic District, the project-related reconfiguration of these intersections will not adversely impact the historic significance of the Grand Boulevard Historic District.

Indirect Impacts

Key View 5 (shown earlier on Figure 3.7-14) is within the Grand Boulevard Historic District. As discussed in the FOE, Alternatives 1 and 2 propose the widening of the SR-91 overcrossings at Grand Boulevard. For Alternatives 1 and 2, the biggest potential for visual and noise impacts would be near the overcrossings themselves. The proposed new overcrossing clearances above Grand Boulevard will be no more than 2 ft higher or lower than the existing clearances, but there will be 12 to 14 ft high sound walls on the bridges where there currently are none (as shown on Figure 3.7-14, which provides a visual simulation of the sound walls on SR-91). Because of the circular design of Grand Boulevard and the location of the overcrossings near the northernmost part of the circle, the overcrossings are only visible from a very limited part of Grand Boulevard. Furthermore, the integrity of the northernmost section of Grand Boulevard has already been compromised by the visual intrusion of the

modern freeway, as well as intersection modifications, a grade separation, construction of adjacent modern development, relocation of sidewalks, and removal of street trees. The Initial Phases of Alternatives 1 and 2 will maintain the existing configuration of Grand Boulevard, but proposes the removal and replacement of small segments of the existing sidewalks, curbs, and gutters, relocation of up to 7 acorn-style streetlights elsewhere along Grand Boulevard, and the removal of 18 street trees. All of these project improvements will occur in the northernmost part of the Grand Boulevard circle, which has already been compromised by previous road improvements in this area.

The Alternative 1 and 2 Ultimate Projects, including the Ultimate Project for Alternative 2f, would not result in any impacts to the Grand Boulevard Historic District because there would be no project construction in the Historic District in the Ultimate Projects for those Alternatives.

The Department originally determined that neither of the Initial Phases of Alternatives 1 and 2 or the Ultimate Projects would result in the permanent, temporary, or constructive use of the Historic District, as defined in 23 CFR Section 774.17; therefore, Section 4(f) does not apply.

The Department reconsidered and made a determination that the impacts at the Grand Boulevard Historic District would be de minimis.

Summary of Consultation with the State Historic Preservation Officer

As required by 36 CFR Part 800 and the Section 106 PA (January 2004), the Department opened consultation with the SHPO by letter on August 4, 2010, to request concurrence on the eligibility of 23 cultural resources within the APE. A copy of that letter is provided in Appendix M. Pursuant to Stipulation IX.A of the Section 106 PA, the Department proposed that a finding of No Historic Properties Affected was appropriate for this undertaking. On September 20, 2010, the SHPO concurred with the Department's recommendation that the 23 properties in the APE, including the Grand Boulevard Historic District, were not eligible for the National Register. That letter is also included in Appendix M.

In January 2011, the Preservation Society nominated the Grand Boulevard Historic District for the National Register, and on July 14, 2011, the property was listed on the National Register. As a result, the Department prepared a Supplemental HPSR (August 2011) and a Finding of Effect (August 2011) to document this change in status of this property relative to Section 106. The Department continued its

consultation with the SHPO by letter dated September 8, 2011, requesting SHPO concurrence that the undertaking will have No Adverse Effect on the National Register-listed Grand Boulevard Historic District. The Department sent a letter to SHPO on June 15, 2012, reinitiating consultation with SHPO regarding the Finding of No Adverse Effect for the project effects on the Grand Boulevard Historic District. The intent of the June 15, 2012, letter was to notify SHPO that the Department, as assigned by FHWA, intends to make a de minimis finding for Section 4(f) use of a historic property, based on SHPO's concurrence with the Finding of No Adverse Effect for the project effects on the District. The SHPO concurred with the Department's de minimis determination for the Grand Boulevard Historic District in a letter dated June 26, 2012. Copies of the Department's June 15, 2012, letter and the SHPO's June 26, 2012, letter are provided in Attachment 5.J in Chapter 5.

Finding of Effect

The Department, as assigned by the FHWA, has determined that the undertaking may have an effect on historic properties (36 CFR 800.4[d][2]). The Department, as assigned by the FHWA, has applied the Criteria of Adverse Effect (36 CFR 800.5(a)) for the undertaking, which includes physical improvements to SR-91 that impact two segments of the Grand Boulevard Historic District, together totaling approximately 3,620 linear feet or 0.68 mi. The Grand Boulevard Historic District is listed in the National Register (July 14, 2011). Pursuant to 36 CFR 800.5(c) and Section 106 PA stipulation X.B.1, as assigned by the FHWA, the Department concluded that the SR-91 CIP Build Alternatives would have No Adverse Effect without Standard Conditions on the Grand Boulevard Historic District.

SHPO Concurrence with the Finding of Effect

As noted above, SHPO concurred with the Department's de minimis determination for the Grand Boulevard Historic District in a letter dated June 26, 2012.

No Build Alternative

No project improvements would be constructed under the No Build Alternative.

3.8.4 Condition Placed on the Project and Other Measures

3.8.4.1 Condition for the Acorn-Style Streetlights in the Grand Boulevard Historic District

The following condition will be implemented during the design/build phase regarding the removal, temporary storage, and relocation of up to seven existing acorn-style streetlights within the project disturbance limits in the Grand Boulevard Historic

District. This condition on the project would be required for the Initial Phases under Alternatives 1 and 2.

- The RCTC Project Engineer will require the design/build contractor to clearly indicate on the final plans the locations of up to seven acorn-style streetlights in the project disturbance limits that are to be removed at the beginning of construction in those areas and to identify the locations where the removed streetlights would be reinstalled.
- The RCTC Resident Engineer will require the design/build contractor to remove and, as necessary, dismantle, the affected acorn-style streetlights and to place them in containers appropriate for storing those fixtures during the project construction period.
- The RCTC Resident Engineer will require the design/build contractor to store the containers holding the acorn-style streetlights in a secure location protected from public access and weather.
- The RCTC Project Engineer will require the design/build contractor to verify that the locations identified for the reinstallation of the affected streetlights are acceptable to the City of Corona and consistent with the City's requirements for the siting of streetlights.
- The RCTC Resident Engineer will require the design/build contractor to reinstall the acorn-style streetlights at the locations designated in the final plans when no further construction/disruption will occur at those locations, as follows:
    - The streetlights will be reinstalled as close to their original locations as possible based on the project design and available space, in a manner consistent with the other acorn-style streetlights in the Grand Boulevard Historic District and with the City of Corona requirements for the siting of streetlights.
    - If any of the acorn-style streetlights cannot be reinstalled at or near their original locations, they will be reinstalled elsewhere within the boundaries of the Grand Boulevard Historic District, focusing on locations where acorn-style lights have previously been removed as long as those locations are consistent with the historic spatial relationships of the Historic District and with the City of Corona requirements for the siting of streetlights; and
    - If the lights cannot be reinstalled as described above, the RCTC Project Engineer will consult with the City of Corona to identify alternative locations.

- The RCTC Resident Engineer will require the construction contractor to have an architectural historian on site during the removal, dismantling, and reinstallation of the acorn-style streetlights.

3.8.4.2 Measure for Replacement of Trees Removed from the Grand Boulevard Historic District

CR-1 **Replacement of Trees in the Grand Boulevard Historic District.** The requirements of Measure V-2 in Section 3.7.4, Environmental Consequences, related to highway planting would apply to the replacement of the 18 trees in the Grand Boulevard Historic District. In addition, the following will be implemented during the design/build phase regarding the removal and replacement of the 18 trees in the Grand Boulevard Historic District. This measure would be required for the Initial Phases of Alternatives 1 and 2.

- The RCTC Project Engineer will require the design/build contractor to replace all trees removed in the Historic District at a ratio of 1:1.
- The RCTC Project Engineer will require the design/build contractor to install replacement trees that are compatible with the existing plantings in the Grand Boulevard Historic District and with the overall character of the Historic District, and that the replacement trees be identified in consultation with the City of Corona, the Department's District Landscape Architect, and a Professional Qualified Staff Architectural Historian from the District. The replacement trees will be selected from the following species: palms, carob, eucalyptus, pepper, cypress, and magnolia.
- The RCTC Project Engineer will require the construction contractor to install all replacement trees no later than the completion of construction activities in the Grand Boulevard Historic District.

3.8.4.3 Measures for the Discovery of Cultural Materials or Human Remains

These measures would be required for the Initial Phases and Ultimate Projects for Alternatives 1 and 2.

CR-2 **Discovery of Cultural Materials.** If cultural materials are discovered during construction, the RCTC Resident Engineer will require the design/build contractor to divert all earthmoving activity within and around the immediate discovery area until a qualified archaeologist can assess the nature and significance of the find.

CR-3 **Discovery of Human Remains.** If human remains are discovered during construction, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains and that the County Coroner shall be contacted. Pursuant to PRC Section 5097.98, if the remains are thought to be Native American, the Coroner will notify the NAHC, which will then notify the MLD. At that time, the Department's District 8 Environmental Branch Chief or the District 8 Native American Coordinator (Gary Jones, [909] 383-7505) will be contacted so they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

3.8.4.4 Mitigation for Native American Monitoring

As discussed earlier, the Pechanga Band of Mission Indians requested monitoring during construction as described in the following measures, which would be required for the Initial Phases and Ultimate Projects under the SR-91 CIP Build Alternatives.

CR-4 During final design, the RCTC Project Manager and Department Cultural Resources Professionally Quality Staff will coordinate with representatives from the Pechanga Band of Mission Indians to identify areas in the project disturbance limits considered sensitive the Tribe.

During final design, the RCTC Project Engineer will identify on the project plans all areas that require monitoring by a Native American Monitor during site preparation, disturbance, and grading.

During all site preparation, disturbance, and grading, the RCTC Resident Engineer will require the design/build contractor to have a Native American monitor present and conducting monitoring activities is all areas identified by the Pechanga Band of Mission Indians as sensitive as shown in the project specifications.

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PHYSICAL ENVIRONMENT

3.9 Hydrology and Floodplains

3.9.1 Regulatory Setting

Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The Federal Highway Administration (FHWA) requirements for compliance are outlined in 23 CFR 650 Subpart A.

In order to comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments
- Risks of the action
- Impacts on natural and beneficial floodplain values
- Support of incompatible floodplain development
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project

The base floodplain is defined as "the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year." An encroachment is defined as "an action within the limits of the base floodplain."

3.9.2 Affected Environment

This section is based on the *Summary of Floodplain Encroachment for the State Route 91 Corridor Improvement Project* (May 2010), the *Location Hydraulic Study for the State Route 91 Corridor Improvement Project* (May 2010), the *Location Hydraulic Study Segment 1* (May 2010), and *the Location Hydraulic Study Sections 2 and 3* (May 2010). The findings of those reports are summarized in this section.

3.9.2.1 Floodplains

According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps[1] (FIRMs), the project area along SR-91 is within the following FEMA-mapped 100-year floodplains:

[1] FEMA Firm Map Nos. 06059C0180H, February 18, 2004; 06059C0185H, February 18, 2004; 06065C1335G, August 28, 2008; 06065C0668G, August 28,

- Santa Ana River (Zone AE [base flood elevations determined]) near Gypsum Canyon Road and the Orange/Riverside County line
- Santa Ana River (Zone A [no base flood elevations determined]) near Green River Road, Coal Canyon, and Wardlow Wash
- Country Club Creek (Zone AE) at the Mountain View Country Club in Corona
- Oak Street Creek Channel (Zone A) near North Lincoln Avenue in Corona
- Zone AO (flood depths of 1 to 3 ft) of an unnamed floodplain near West Grand Boulevard and West Second Street in Corona
- Temescal Wash (Zone AE) near the SR-91/I-15 interchange

Along I-15, the study area crosses the 100-year floodplain of the South Norco Channel (Zone AE) at Corona Avenue in Corona. Figure 3.9-1 shows the 100-year FEMA-mapped floodplains in the vicinity of the project segments on SR-91 and I-15.

To accommodate the project and improve local bank protection, the Santa Ana River is being improved and relocated to the north as part of a separate Corps project. The Corps has completed an SEIS for the Santa Ana River realignment. The Santa Ana River realignment will be completed and operational before the construction of the project starts. A Letter of Map Revision (LOMR) will be necessary to redefine the floodplain maps for the affected segments of the Santa Ana River (FEMA FIRMs 06059C0185H, February 18, 2004; 06065C1335G, August 28, 2008; and 06065C0669G, August 28, 2008) as part of the River relocation by the Corps. The LOMR would be the responsibility of the Corps. The LOMR would show the 100-year floodplain of the Santa Ana River as shifted to the north. The floodplain that extends through the Wardlow Wash double 12x9 ft reinforced concrete box (RCB) wildlife crossing would also be extended to meet the new Corps bank protection as part of the Corps bank protection project.

In addition to the Corps bank protection project, a separate Corps Santa Ana Mainstem project is underway. That project includes raising the height of Prado Dam and constructing protective dikes. That project would require revisions to the existing floodplains near Prado Dam.

2008; 06065C0669G, August 28, 2008; 06065C0688G, August 28, 2008; 06065C0689G, August 28, 2008; and 06065C0693G, August 28, 2008.

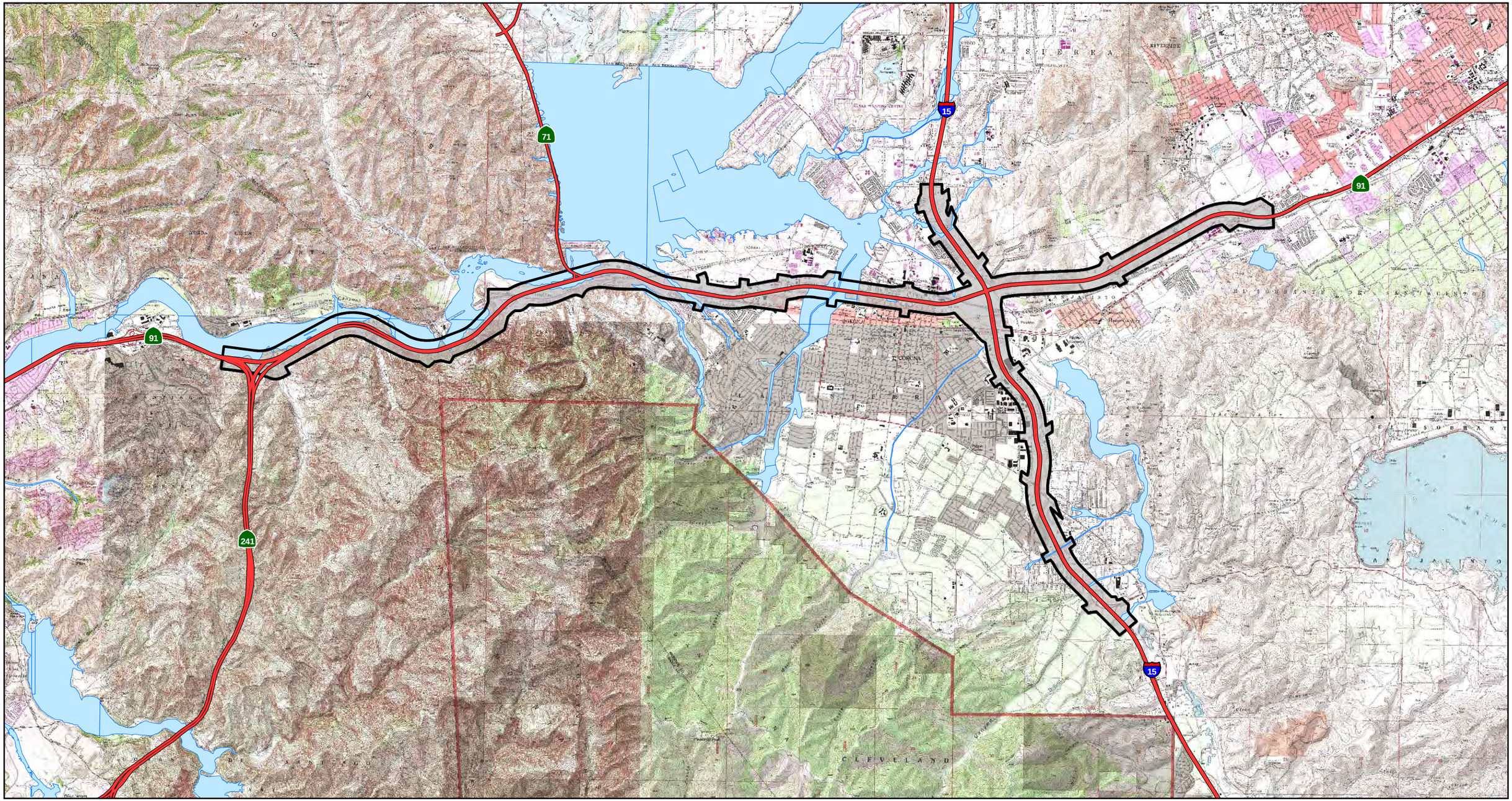

FIGURE 3.9-1

LEGEND

SR-91 Study Area

100-Year Floodplain

N

0 3300 6600

FEET

SR-91 Corridor Improvement Project

FEMA Mapped 100-Year Floodplains

12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
EA 0F540

SOURCE: FEMA (2008), PB (2008), USGS 7.5' QUAD - BLACK STAR CANYON ('88), CORONA NORTH ('81), CORONA SOUTH ('88), PRADO DAM ('81), RIVERSIDE WEST ('81); CALIF.

I:\PAZ0701\GIS\WaterQuality\Floodplain Section\Floodplains_100year.mxd (6/23/2010)

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3.9.2.2 Natural and Beneficial Floodplain Values

Floodplains and wetlands in their natural or relatively undisturbed states serve water resource values (e.g., natural moderation of floods, water quality maintenance, and groundwater recharge), living resource values (e.g., fish, wildlife, and plant species), and cultural resource values (e.g., open space, archaeological, historical natural beauty, scientific study, outdoor education, and recreation). The beneficial uses for surface waters in the project study area are defined in the *Santa Ana River Basin Water Quality Control Plan* (Santa Ana RWQCB, February 2008) as various ways that water can be used for the benefit of people and/or wildlife.

The following beneficial uses have been identified in the *Santa Ana River Basin Water Quality Control Plan* for the Santa Ana River in the study area:

- **Agricultural Water Supply (AGR):** Waters are used for farming, horticulture or ranching. These uses may include, but are not limited to, irrigation, stock watering, and support of vegetation for range grazing.
- **Groundwater Recharge (GWR):** Waters are used for natural or artificial recharge of groundwater for purposes that may include, but are not limited to, future extraction, maintaining water quality, or halting saltwater intrusion into freshwater aquifers.
- **Water Contact Recreation (REC1):** Waters are used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses may include, but are not limited to, swimming, wading, water skiing, skin and scuba diving, surfing, whitewater activities, fishing, and use of natural hot springs.
- **Noncontact Water Recreation (REC2):** Waters are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
- **Warm Freshwater Habitat (WARM):** Waters support warm water ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
- **Wildlife Habitat (WILD):** Waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.

- **Rare, Threatened, or Endangered Species Habitat (RARE):** Waters support the habitats necessary for the survival and successful maintenance of plant or animal species designated under State or federal law as rare, threatened, or endangered.
- **Spawning Habitat (SPWN):** Waters support high-quality aquatic habitats necessary for reproduction and early development of fish and wildlife.

3.9.3 Environmental Consequences

3.9.3.1 Summary of Impacts

Assuming a worst case using the existing FIRMs and the total improvements under Alternative 2, the Initial Phases of Alternatives 1 and 2 would result in encroachments into the 100-year floodplain at the Santa Ana River at Wardlow Wash, at Country Club Creek, and at West Grand Boulevard. There would be no appreciable increase in the 100-year surface water elevations under Alternatives 1 and 2. There would not be significant encroachments, and the encroachments would not result in significant adverse impacts to natural and beneficial floodplain values. There would be no additional encroachments in the Ultimate Project for Alternatives 1 and 2.

Alternatives 1 and 2 could result in erosion of exposed soil surfaces during construction that would be controlled using BMPs as described in the Storm Water Pollution Prevention Plan (SWPPP). Temporary detention basins would be used, as needed, during construction to prevent localized flooding. Therefore, the construction of Alternatives 1 and 2 would not result in adverse impacts related to floodplains.

Summary of Impacts for Alternative 2f

Alternative 2f has been identified as the Preferred Alternative. Alternative 2f would also result in the same encroachments into the 100-year floodplain as described above for Alternative 2. There would be no appreciable increase in the 100-year surface water elevations under Alternative 2f, no significant encroachments, and the encroachments would not result in significant adverse impacts to natural and beneficial floodplain values. The floodplain encroachments will occur in the Initial Phase. No additional enroachments will occur in the Ultimate Project for Alternative 2f.

Similar to Alternative 2 as described above, during construction, the Alternative 2f Initial Phase and Ultimate Project could also result in an erosion of exposed soil surfaces that would be controlled using BMPs. The construction of the Alternative 2f

Initial Phase and Ultimate Project would not result in adverse impacts related to floodplains.

3.9.3.2 Permanent Impacts

Alternatives 1 and 2

As mentioned above, Corps projects would modify the Santa Ana River floodplain and Prado Dam (these projects are not reflected in the current FIRMs for this area). As a result, the Build Alternatives would either not encroach into the Santa Ana River floodplain near Wardlow Wash or the encroachment would be less than when comparing the project to the existing FEMA FIRMs. Because it is unclear at this time whether or not an encroachment would occur at this location after the Corps projects have been implemented and the FIRMs are revised, this analysis assumes that an encroachment would occur under the Build Alternatives. As discussed below, three encroachments were identified for the Build Alternatives based on the existing FIRMs. Specifically, the analysis of floodplain encroachment is based on the existing floodplain, which represents a worst-case scenario for the Build Alternatives.

In addition, without the relocation of the Santa Ana River, the project would result in a fourth encroachment downstream of Prado Dam at the Green River Golf Club. However, after implementation of the Corps projects, the project would not encroach on the floodplain at this location. Because this analysis of floodplain encroachment assumes that the Santa Ana River will already be relocated prior to construction of the project, it is assumed that no encroachment would occur at this location.

As discussed below, the Build Alternatives would encroach on the 100-year floodplain at three locations when compared to the existing FIRMs. This analysis is based on the worst-case possible encroachment under Alternative 2.

As shown earlier in Table S.5, any modifications to existing storm and local flood control facilities or Corps facilities will require coordination with the OCFCD, RCFCD, and/or Corps, as appropriate. Any such modifications would need to be approved by the appropriate agency during final design and prior to any construction at or near the affected flood control and/or Corps facilities.

Encroachments

Santa Ana River Near Wardlow Wash (FEMA FIRM 06065C0669G, August 28, 2008)

The floodplain at this location is at the Prado Dam outlet in the City of Corona in Riverside County. This area is adjacent to the confluence of the Santa Ana River

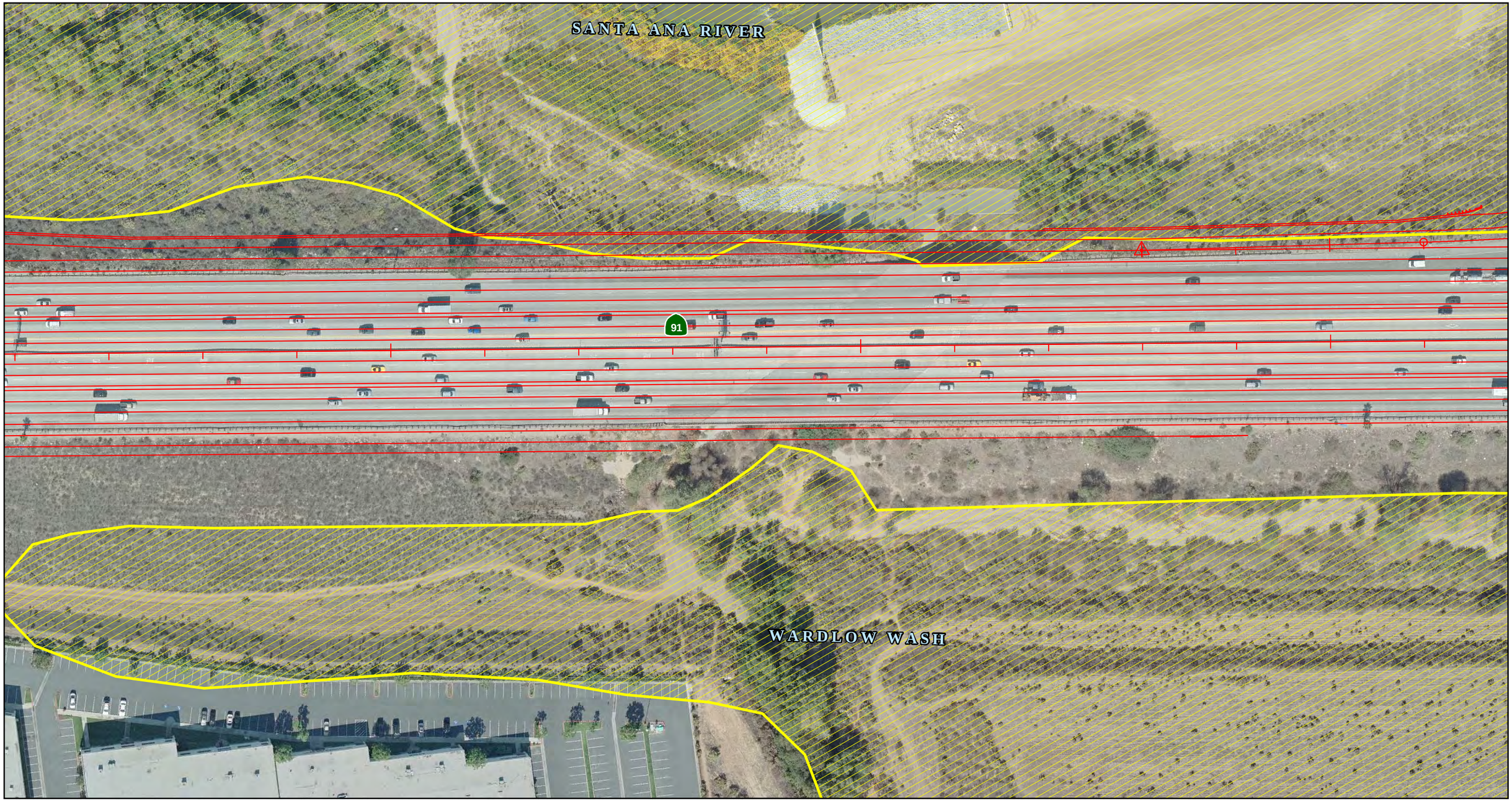
and Wardlow Wash. SR-91 is raised above the 100-year floodplain through this stretch of the study area. The floodplain in this area is Zone A.

The improvements at this location include the addition of lanes to SR-91, improvements to the SR-71/SR-91 interchange, and extension of the existing Wardlow Wash reinforced concrete pipe wildlife crossing. The widened road would be constructed on a retaining wall. The retaining wall would extend approximately 5 to 60 ft into the existing (2009) floodplain. However, because the Corps bank protection project would move the floodplain boundary north, the actual encroachment is anticipated to be less. In addition, the Build Alternative improvements to the SR-71/SR-91 interchange would encroach on the floodplain. As shown on Figure 3.9-2, the floodplain encroachments that would occur at this location would be longitudinal encroachments (parallel to the direction of flow).

The Build Alternatives propose improvements to an existing freeway that is already in the floodplain. The SR-91 corridor narrows in the vicinity of the Orange/Riverside County line and is bounded by hills to the south and the Santa Ana River to the north. The Mindemann Landslide, which is a large, ancient landslide, and numerous smaller landslides superimposed on that ancient landslide are in the hills on the south side of SR-91 in this area. Under the Build Alternatives, the SR-91 centerline would be shifted north at this location so that all the widening would occur on the north side of the alignment. Widening SR-91 to the north is preferred over the extensive excavation and/or retaining walls that would be necessary to accommodate widening into the hillside on the south side of SR-91 in the vicinity of the Mindeman Landslide. Widening to the north is also consistent with the improvements recently constructed SR-91 Eastbound Lane Addition project (separate project). For these reasons, there are no practical alternatives to the widening of the SR-91 to the north and the resulting longitudinal encroachment into the floodplain under Alternatives 1 and 2.

Country Club Creek (FEMA FIRM 06065C0688G, August 28, 2008)

The floodplain at this location is at the Mountain View Golf Course in the City of Corona. SR-91 is raised above the 100-year floodplain through this stretch. The floodplain in this area is Zone AE.



LEGEND

Floodplain Boundary

Alternative 1 and 2 Projects
Segment 1 (with SR-71 Connector)

0 1250 2500
FEET

NOTE: Encroachments into the 100-year floodplain would be less than shown on this figure. This figure shows the existing floodplain, which will be revised after construction of the Army Corps of Engineers Prado Dam and Santa Ana River Bank Stabilization project is complete.

Map Index

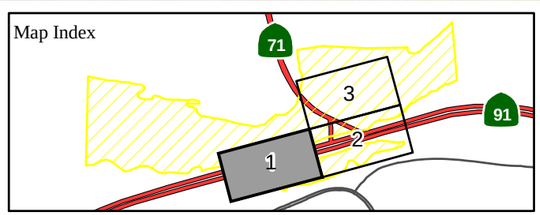


FIGURE 3.9-2
Sheet 1 of 3

SR-91 Corridor Improvement Project

Floodplain Encroachments at the Santa Ana River near Wardlow Wash

12-Ora-91-R15.93/R18.91
08-Riv-91-R0.00/R10.85
08-Riv-15-36.58/42.47
EA 0F540

SOURCE: FEMA (2008), PB (2010), MSVE (2008)

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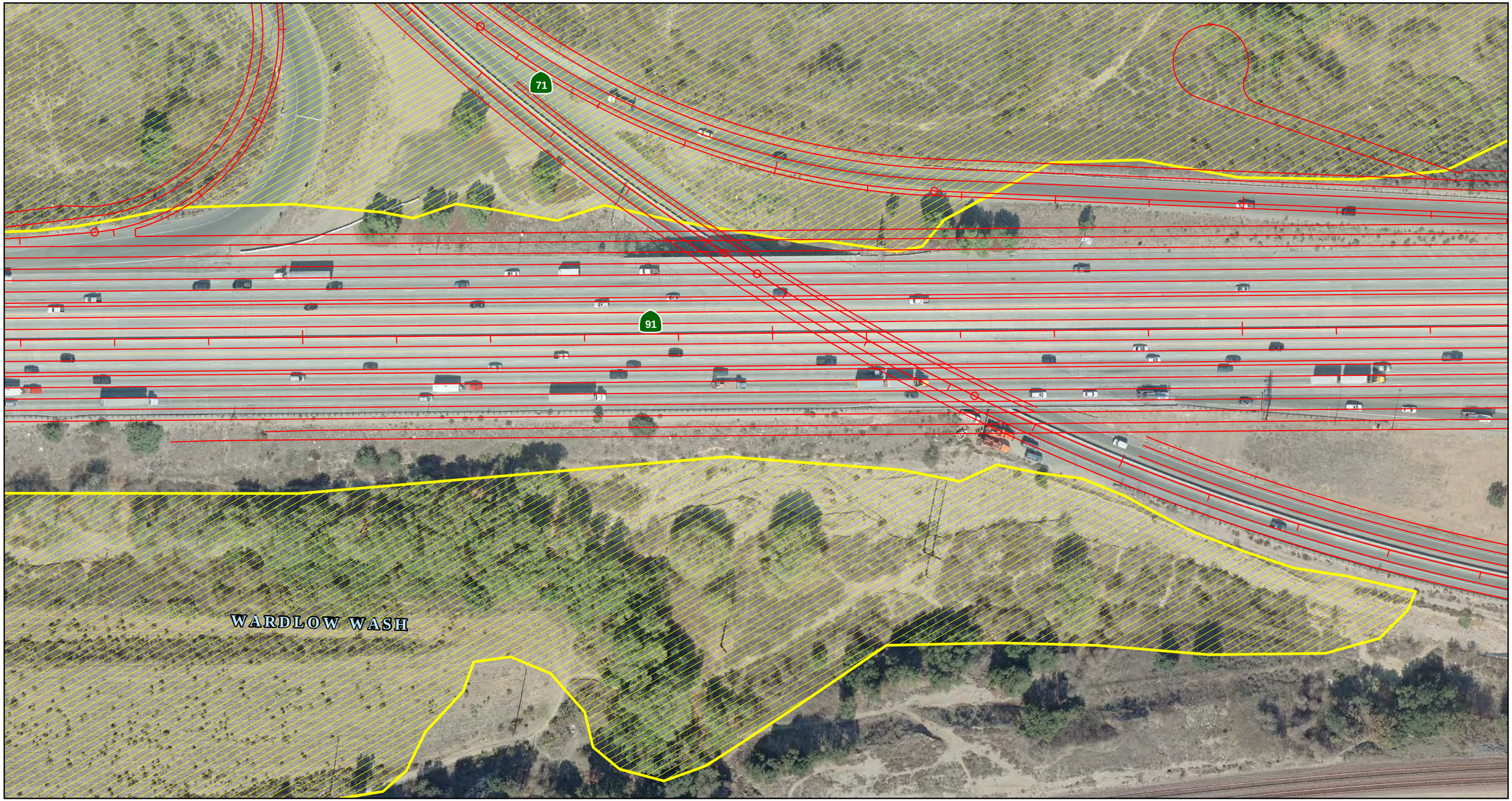

LEGEND

Floodplain Boundary

Alternative 1 and 2 Projects
Segment 1 (with SR-71 Connector)

0 1250 2500
FEET

NOTE: Encroachments into the 100-year floodplain would be less than shown on this figure. This figure shows the existing floodplain, which will be revised after construction of the Army Corps of Engineers Prado Dam and Santa Ana River Bank Stabilization project is complete.

Map Index

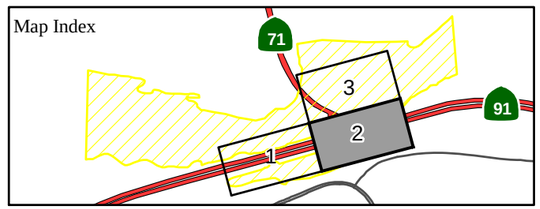

FIGURE 3.9-2
Sheet 2 of 3

SR-91 Corridor Improvement Project

Floodplain Encroachments at the Santa Ana River near Wardlow Wash

12-Ora-91-R15.93/R18.91
08-Riv-91-R0.00/R10.85
08-Riv-15-36.58/42.47
EA 0F540

SOURCE: FEMA (2008), PB (2010), MSVE (2008)

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LEGEND

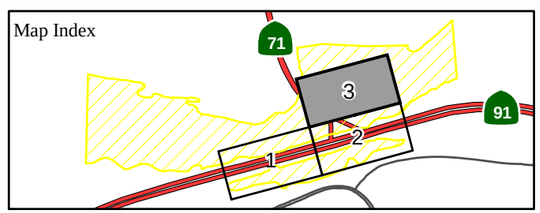
Floodplain Boundary

Alternative 1 and 2 Projects
Segment 1 (with SR-71 Connector)

NOTE: Encroachments into the 100-year floodplain would be less than shown on this figure. This figure shows the existing floodplain, which will be revised after construction of the Army Corps of Engineers Prado Dam and Santa Ana River Bank Stabilization project is complete.

0 1250 2500
FEET

Map Index



SOURCE: FEMA (2008), PB (2010), MSVE (2008)

I:\PAZ0701\GIS\WaterQuality\Floodplain Section\Floodplains_SantaAnaRiver.mxd (9/23/2010)

FIGURE 3.9-2
Sheet 3 of 3

SR-91 Corridor Improvement Project

Floodplain Encroachments at the Santa Ana River near Wardlow Wash

12-Ora-91-R15.93/R18.91
08-Riv-91-R0.00/R10.85
08-Riv-15-36.58/42.47
EA 0F540

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The improvements at this location include the addition of lanes on SR-91 in each direction and improvements to the eastbound off-ramp at the Auto Center Drive/ Serfas Club Drive interchange. The widened road would be constructed on a retaining wall. The retaining wall would extend approximately 50 to 80 ft into the existing floodplain. As shown in Figure 3.9-3, that floodplain encroachment would be a transverse encroachment (perpendicular to the direction of flow).

West Grand Boulevard (FEMA FIRM 06065C0689G, August 28, 2008)

The floodplain at this location is in the City of Corona. The floodplain is mostly a developed residential area south of SR-91. SR-91 is raised above the 100-year floodplain through this stretch. The floodplain in this area is Zone AO.

Risks to Life and Property

Santa Ana River Near Wardlow Wash

The encroachment from the new retaining wall at this location is too minor to result in a substantial change in the 100-year water surface elevation of this floodplain. The quantity of flow (approximately 34,000 cfs) in the Santa Ana River controls the confluence hydraulics with Wardlow Wash. As a result, the encroachment on the 100-year floodplain at this location under Alternatives 1 and 2 and their design variations would not result in an appreciable increase of the 100-year water surface elevation. In addition, Alternatives 1 and 2 and their design variations would not result in substantial interruption of emergency services or routes at this location. A TMP will be prepared and coordinated with emergency service providers to minimize impacts to emergency services during ramp or mainline closures during construction. During operation, Alternatives 1 and 2 would have a beneficial impact on emergency services by improving traffic throughput and travel times and reducing delay. Therefore, there would be no significant floodplain-related risks to life or property at this location as a result of Alternatives 1 and 2 and their design variations.

Country Club Creek

The Corps Hydrologic Engineering Center River Analysis System (HEC-RAS) model was used to determine changes in the 100-year flood surface elevation at this location as a result of the Build Alternatives. The modeling results indicate that the improvements would not result in a change to the water surface elevation or velocity of Country Club Creek at this location. In addition, Alternatives 1 and 2 and their design variations would not result in substantial interruption of emergency services or routes at this location. A TMP will be

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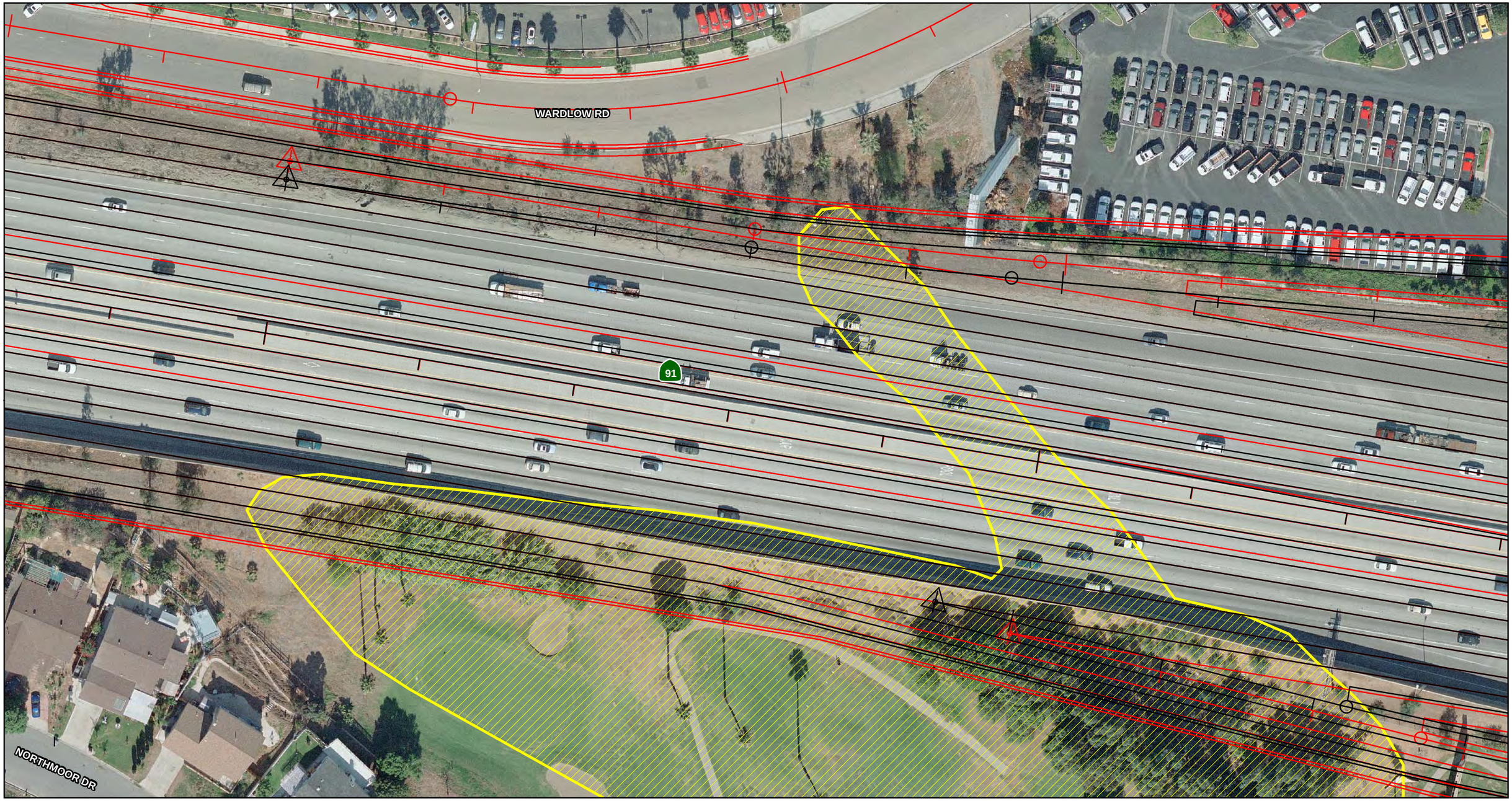

LEGEND

Floodplain Boundary

Alternative 1 Project Segment 1
Auto Center/Maple Interchange Direct Connector and Split Diamond

Alternative 2 Project Segment 1
Auto Center/Maple Interchange Direct Connector and Split Diamond

N

0 30 60
FEET

SOURCE: FEMA (2008), PB (2010).

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FIGURE 3.9-3

SR-91 Corridor Improvement Project

Floodplain Encroachment
at Country Club Creek

12-Ora-91-R15.93/R18.91
08-Riv-91-R0.00/R10.85
08-Riv-15-36.58/42.47
EA 0F540

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prepared and coordinated with emergency service providers to minimize impacts to emergency services during ramp or mainline closures during construction. During operation, Alternatives 1 and 2 would have a beneficial impact on emergency services by improving traffic throughput and travel times and reducing delay. Therefore, there would be no substantial floodplain-related risks to life or property at this location as a result of Alternatives 1 and 2 and their design variations.

West Grand Boulevard

The encroachments from the culvert extension and new retaining wall are minor at this location and would not result in an appreciable increase of the 100-year water surface elevation of the floodplain. In addition, implementation of the Build Alternatives would not result in substantial interruption of emergency services or routes. A TMP will be prepared and coordinated with emergency service providers to minimize impacts to emergency services during ramp or mainline closures during construction. During operation, Alternatives 1 and 2 would have a beneficial impact on emergency services by improving traffic throughput and travel times and reducing delay. Therefore, there would be no substantial floodplain-related risks to life or property at this location as a result of Alternatives 1 and 2 and their design variations.

Impacts to Natural and Beneficial Floodplain Values

Grading, construction, and operation of the Build Alternatives could potentially result in direct impacts to natural and beneficial floodplain values and could impair the identified beneficial uses of those water bodies. The potential impacts of construction activities on beneficial uses focus primarily on sediments, turbidity, and pollutants that might be associated with sediments (e.g., phosphorus and pesticides) and how these may impact beneficial uses. Construction-related activities that are primarily responsible for sediment releases are related to exposing soils to potential erosion by rainfall/runoff and wind. Those activities include removal of vegetation and existing structures from the site, grading and excavation of the site, and construction of new road surfaces and structures. These activities can create the potential for sediment to be transported outside the project limits with storm water runoff and potentially impair beneficial uses of receiving waters. For example, if substantial amounts of sediment are transported downstream to the Santa Ana River, the following beneficial uses may be impaired: REC1,REC2, WARM, WILD, RARE, and SPWN.

Non-sediment-related pollutants of concern during construction include waste construction materials; chemicals, liquid products, and petroleum products (such as paints, solvents, and fuels) used in construction or the maintenance of heavy equipment; and concrete-related waste streams. These construction-related pollutants may be spilled, leaked, or transported via storm runoff into receiving waters and may potentially impair beneficial uses. For example, if substantial amounts of waste construction materials, chemicals, liquid products, and petroleum products were transported to the Santa Ana River, the following beneficial uses may be impaired: AGR, GWR, REC1, REC2, WARM, WILD, RARE, and SPWN.

As discussed earlier, the Build Alternatives would encroach on floodplains at the Santa Ana River near Wardlow Wash at Country Club Creek and at West Grand Boulevard. All these encroachments would occur at the edges of the existing freeway facilities and would be generally within or adjacent to developed uses or disturbed/ low quality vegetation. As a result, the areas of floodplain encroachment do not provide high-quality beneficial values related to water resources, living resources, or cultural resources. Therefore, implementation of the Build Alternatives would not result in substantial impacts to natural and beneficial floodplain values, and the beneficial uses of the noted floodplains are not likely to be adversely impacted. In addition, compensatory mitigation within the same watershed for impacts to wetlands, described later in Section 3.18, Wetlands and Other Waters, would help to reduce potential impacts to water resource beneficial floodplain values within the watershed.

Incompatible Floodplain Development

Alternatives 1 and 2 and their design variations include improvements to existing transportation facilities to improve travel conditions and reduce traffic impacts to the existing road network. The project and future development in the area would have some physical effect on the floodplain, but the project and future nonproject-related development would be required to comply with policies in the General Plans for the Counties of Orange and Riverside, and the Cities of Anaheim, Corona, Norco, Riverside, and Yorba Linda. Therefore, the project would not promote incompatible floodplain development.

Assessment of Significant Encroachments

The improvements at this location include the addition of pavement to eastbound SR-91, construction of a new retaining wall, and the realignment of Second Street. The realignment of Second Street would require a 20 ft extension of the existing 48 in reinforced concrete pipe at the South Belle Avenue and Second Street intersection

and a 10 ft extension of the 36 in reinforced concrete pipe at the South Sheridan Street and Second Street intersection. The existing 36 in reinforced concrete pipe at South Merrill Street would not be modified or extended as part of the Build Alternatives. As shown in Figure 3.9-4, the floodplain encroachments that would result from the extension of the two drainage structures described above would be transverse encroachments.

A "significant encroachment" as defined at 23 CFR 650.105 is a highway encroachment and any direct support of likely base floodplain development that would involve one or more of the following construction or flood- related impacts:

- A significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route;
- A significant risk (to life or property); or
- A significant adverse impact on natural and beneficial floodplain values.

The potential for the project to result in a significant encroachment into the base floodplain is discussed in detail below.

In summary, the actions under the Alternative 1 and 2 Initial Phases and Ultimate Projects do not constitute significant floodplain encroachment as defined in 23 CFR Section 650.105(q). The project would require construction of retaining walls and extension of existing culverts within the 100-year floodplain. The project would not result in a substantial change in the capacity of the Santa Ana River or Country Club Creek to carry water. The project would result in a minimal increase in flood heights and flood limits. This minimal increase would not result in a significant change in flood risks or damage. The encroachments would not result in significant adverse impacts on the natural and beneficial floodplain values, would not result in a significant change in flood risks or damage, and would not have significant potential for interruption or termination of emergency services or emergency routes. Therefore, the project-related floodplain encroachments are not significant under 23 CFR Section 650.105(q).

Agency Coordination

Coordination with FEMA for impacts to the 100-year floodplain is not required because the project would not result in an appreciable increase of the 100-year water surface elevation or change the boundaries of the 100-year floodplain.

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LEGEND

- Floodplain Boundary
- Alternative 1 Project Segment 2 (with Lincoln Avenue Hook Ramps)
- Alternative 2 Project Segment 2 (with Lincoln Avenue Hook Ramps)

N

0 30 60
FEET

SOURCE: FEMA (2008), PB (2010).

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FIGURE 3.9-4

SR-91 Corridor Improvement Project

Floodplain Encroachment
at West Grand Boulevard

12-Ora-91-R15.93/R18.91
08-Riv-91-R0.00/R10.85
08-Riv-15-36.58/42.47
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No Build Alternative

Under the No Build Alternative, no project improvements would be constructed. No hydrology and floodplain adverse impacts would occur because there would be no construction in the study area under the No Build Alternative. The existing surface hydrology and floodplains would not change from the existing conditions, other than what would occur under the Corps projects in this area, as described earlier.

Under the No Build Alternative, no impacts to natural and beneficial floodplain values would occur as a result of grading, construction, and operation of any SR-91 CIP improvements. Therefore, the No Build Alternative is not expected to result in substantial impacts to natural and beneficial floodplain values.

3.9.3.3 Temporary Impacts

Alternatives 1 and 2

The possibility of erosion during construction of the project is discussed in detail later in Section 3.10, Water Quality and Storm Water Runoff. BMPs would be used to control erosion during construction. The construction BMPs would be described in the SWPPP and included on the construction plans. Existing general drainage patterns would be maintained during construction, although temporary detours around facilities undergoing reconstruction would occur. Temporary detention basins would be used, if necessary, to prevent localized flooding. The BMPs used to control direct impacts would be effective at controlling indirect impacts related to erosion, drainage patterns, and flooding during construction of Alternatives 1 and 2 and their design variations. As a result, the Alternative 1 and 2 Initial Phases and Ultimate Projects would not result in adverse impacts related to floodplains during construction.

No Build Alternative

Under the No Build Alternative, the project would not be constructed and temporary impacts to hydrology and floodplains would not occur. However, construction of other planned projects could result in temporary erosion impacts similar to those described for the project.

3.9.4 Avoidance, Minimization, and/or Mitigation Measures

As discussed in Section 3.10, Water Quality and Storm Water Runoff, Construction Site, Design Pollution Prevention, and Treatment BMPs will be implemented to minimize water quality-related impacts to the 100-year floodplain and the associated beneficial uses. As discussed in Section 3.17, Natural Communities, and Section 3.18, Wetlands and Other Waters, measures to minimize impacts and preserve natural and

beneficial floodplain values include installation of construction fencing around riparian/riverine vegetation to be preserved and compensatory mitigation for temporary and permanent impacts to riparian and aquatic habitats. With implementation of these measures, no other specific measures for impacts to floodplains are required.

3.10 Water Quality and Storm Water Runoff

3.10.1 Regulatory Setting

3.10.1.1 Federal Requirements: Clean Water Act

In 1972 Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.), from any point source unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. Known today as the Clean Water Act (CWA), Congress has amended it several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. Important CWA sections are:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity, which may result in a discharge to waters of the U.S., to obtain certification from the State that the discharge will comply with other provisions of the act. [Most frequently required in tandem with a Section 404 permit request. See below.]
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

USACE issues two types of 404 permits: Standard and General permits. There are two types of General permits, Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to authorize a variety of minor project activities with no more than minimal effects.

There are two types of Standard permits: Individual permits and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. For Standard permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404 (b)(1) Guidelines (U.S. EPA CFR 40 Part 230), and whether permit approval is in the public interest. The Section 404(b)(1) Guidelines were developed by the U.S. EPA in conjunction with USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA), to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences. Per Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

3.10.1.2 State Requirements: Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the State. It predates the CWA and regulates discharges to waters of the State. Waters of the State include more than just Waters of the U.S., like groundwater and surface waters not considered Waters of the U.S. Additionally, it prohibits discharges of "waste" as defined and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA, and regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in

the applicable RWQCB Basin Plan. States designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, each state identifies waters failing to meet standards for specific pollutants, which are then state- listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source controls, the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

3.10.1.3 State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

- **National Pollution Discharge Elimination System (NPDES) Program**

  Municipal Separate Storm Sewer Systems

  Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water dischargers, including Municipal Separate Storm Sewer Systems (MS4s). The U.S. EPA defines an MS4 as any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying storm water. The SWRCB has identified the Department as an owner/operator of an MS4 by the SWRCB. This permit covers all Department rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

  The Department's MS4 Permit, under revision at the time of this update, contains three basic requirements:

  1. The Department must comply with the requirements of the Construction General Permit (see below);

2. The Department must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and
3. The Department storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs) and other measures.

To comply with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within the Department for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed Project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit (Order No. 2009-0009-DWQ), adopted on September 2, 2009, became effective on July 1, 2010. The permit regulates storm water discharges from construction sites which result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The 2009 Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply

according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). In accordance with the Department's Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA less than one acre.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water body must obtain a 401 Certification, which certifies that the project will be in compliance with State water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by USACE . The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a 404 permit.

In some cases the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

3.10.2 Affected Environment

The information in this section is based on the *Final Water Quality Assessment Report* for the project (May 2010).

3.10.2.1 Regional Hydrology

The study area for this water quality analysis is in the Santa Ana River Watershed. Specifically, this analysis considered the project alignment in three segments in this watershed:

- **Segment A:** Extends on SR-91 from its interchange with SR-241 in Orange County to just east of the Smith Avenue overcrossing in the City of Corona in Riverside County. Segment A includes an advance signage area extending west from the SR-241 interchange to Weir Canyon Road. Segment A is primarily in the

Santa Ana Narrows Subwatershed of the Lower Santa Ana River Watershed. The subwatersheds are shown on Figure 3.10-1.

- **Segment B:** Extends east on SR-91 from Smith Avenue, across I-15, into the City of Riverside and terminates at Pierce Street. Segment B includes an advance signage area extending west from Pierce Street to Tyler Street. Segment B is in the Temescal and Arlington Subwatersheds of the Middle Santa Ana River Watershed.
- **Segment C:** Extends on I-15 from the Hidden Valley Parkway interchange in the City of Corona south to the Cajalco Road interchange in the City of Corona. Segment C includes advance signage areas extending north from Hidden Valley Parkway to Fifth Street and south from Cajalco Road to Weirick Road. Segment C is in the Temescal and Bedford Subwatersheds of the Middle Santa Ana River Watershed.

The Santa Ana River Watershed drains approximately 2,800 square miles (sq mi), with more than 50 contributing tributaries. The Santa Ana River extends about 96 mi from its headwaters to the Pacific Ocean. The headwaters for the Santa Ana River and its tributaries are in the San Gabriel and San Bernardino Mountains to the north and the San Gorgonio and San Jacinto Mountains to the east. From the San Bernardino and San Gabriel Mountains, the Santa Ana River flows through the Santa Ana Valley, Prado Basin, and a narrow pass in the Santa Ana Mountains, and then southwest to the Pacific Ocean. The Santa Ana River Watershed is divided into upper and lower watersheds at Prado Dam.

3.10.2.2 Local Hydrology

Surface water flow in the study area is generally toward the west, following the local topography and the gradient of the Santa Ana River or the Arlington Valley drainage toward Temescal Wash.

3.10.2.3 Surface Streams

Within the existing State rights-of-way on SR-91 and I-15, storm water runoff from SR-91 and I-15 is currently discharged into adjacent natural and human-made depressed areas, canyons, and existing storm drain systems. The existing channelized storm water from the project segments of SR-91 and I-15 eventually discharges into the Santa Ana River (Reaches 2 and 3) and its tributaries, including Wardlow and Temescal Washes. Surface waters in the study area are shown on Figure 3.10-1.

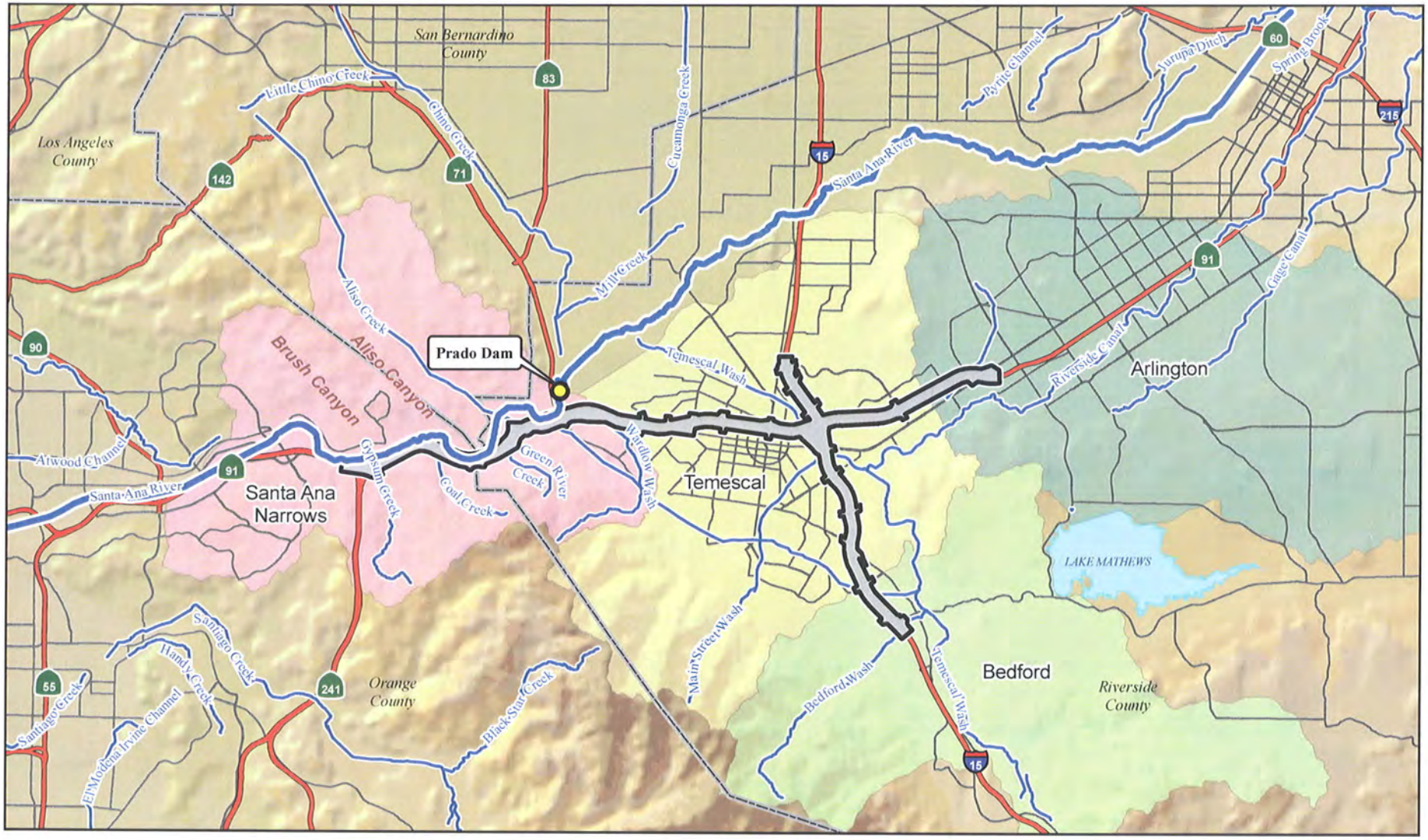

FIGURE 3.10-1

LEGEND

- SR-91 CIP Study Area
- Surface Waters
- Prado Dam

Subwatersheds

- Arlington
- Bedford
- Santa Ana Narrows
- Temescal

0 1.5 3 Miles

SOURCE: ESRI (2006), NHD (2000), TBM (2007), PB (2008)

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SR-91 Corridor Improvement Project

Subwatersheds and Surface Waters

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Within Segment A, the Santa Ana River, Reach 2, from 17th Street in Santa Ana to Prado Dam, parallels and is north of SR-91. Drainages that enter the Santa Ana River in the vicinity of Segment A include Aliso and Brush Canyons from Chino Hills to the north, Wardlow Wash from the east, and Fresno, Coal, and Gypsum Canyons and Green River Creek from the south.

Within Segment B and the eastern part of Segment A, the Santa Ana River, Reach 3, from Prado Dam to Mission Boulevard in Riverside is north of the study area.

Within Segment C, Reach 1 of Temescal Wash (from Lincoln Avenue to the Riverside Canal) parallels I-15 to the west (north of the SR-91/I-15 interchange) and to the east (south of SR-91).

3.10.2.4 Beneficial Uses for Surface Waters

Beneficial uses identified in the RWQCB, Santa Ana Region, *Water Quality Control Plan for the Santa Ana River Basin* (Basin Plan; February 2008) for Reaches 2 and 3 of the Santa Ana River are:

- AGR: Agriculture
- GWR: Groundwater recharge
- REC-1: Body-contact recreation (swimming/wading)
- REC-2: Non-body contact recreation (boating/fishing)
- WARM: Warm water habitat for fish amenable for reproduction in warm water
- WILD: Habitat for wild plants and animals
- RARE: Habitat for rare (threatened/endangered) plants and animals
- SPWN: Habitat for spawning, reproduction, and early development of fish and wildlife (applicable to Reach 3 only)

Beneficial uses identified in the Basin Plan for Reach 1 of Temescal Wash are:

- REC-1: Body-contact recreation (swimming/wading)
- REC-2: Non-body contact recreation (boating/fishing)
- WARM: Warm water habitat for fish amenable for reproduction in warm water
- WILD: Habitat for wild plants and animals

3.10.2.5 Surface Water Quality Objectives

Surface water quality objectives for all inland waters in the region are listed in Table 3.10.1. The Santa Ana River, Reach 2, has the following site-specific numeric water quality objective:

Table 3.10.1 Surface Water Quality Objectives for Inland Surface Waters

Constituent	Concentration	Receiving Waters
Algae	Waste discharges shall not contribute to excessive algal growth in inland surface receiving waters.	All inland surface waters
Ammonia	Varies based on pH and temperature. Ranges from 0.004 to 0.0224 mg/L un-ionized ammonia and 0.05 to 1.49 mg/L total ammonia.	COLD beneficial use designation
	Varies based on pH and temperature. Ranges from 0.0006 to 0.0530 mg/L un-ionized ammonia and 0.119 to 2.27 mg/L total ammonia.	WARM beneficial use designation
Boron	Shall not exceed 0.75 mg/L as a result of controllable water quality factors.	All inland surface waters
Chlorine (residual)	Chlorine residual in wastewater discharged to inland surface waters shall not exceed 0.1 mg/L.	All inland surface waters
Coliform (fecal)	Logarithm means less than 200 organisms per 100 mL based on five or more samples per 30-day period and not more than 10 percent of the samples exceed 400 organisms per 100 mL for any 30-day period.	REC-1 beneficial use designation
	Logarithm means less than 2,000 organisms per 100 mL based on five or more samples per 30-day period and not more than 10 percent of the samples exceed 4,000 organisms per 100 mL for any 30-day period.	REC-2 beneficial use designation
Coliform (total)	Not to exceed 100 organisms per 100 mL.	MUN beneficial use designation
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses. The natural color of fish, shellfish or other inland surface water resources used for human consumption shall not be impaired.	All inland surface waters
Floatables	Waste discharges shall not contain floating materials, including solids, liquids, foam, or scum, that cause a nuisance or adversely affect beneficial uses.	All inland surface waters
Fluoride	Shall not exceed 0.7 to 1.2 mg/L as a result of controllable water quality factors depending on air temperature (refer to Basin Plan).	MUN beneficial use designation
Metals	Varies based on hardness.	All inland surface waters
Methylene blue-activated substances	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Nitrate	Shall not exceed 45 mg/L as NO_3 or 10 mg/L as N.	MUN beneficial use designation
Oil and grease	Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations that result in a visible film or in coating objects in the water or that cause a nuisance or adversely affect beneficial uses.	All inland surface waters
Oxygen (dissolved)	Shall not be depressed below 5 mg/L as a result of controllable water quality factors.	WARM beneficial use designation
	Shall not be depressed below 6 mg/L as a result of controllable water quality factors.	COLD beneficial use designation
	Waste discharges shall not cause the median dissolved oxygen concentration to fall below 85 percent of saturation or the 95th percentile concentration or fall below 75 percent of saturation within a 30-day period.	All inland surface waters
pH	Shall not be raised above 8.5 or depressed below 6.5 as a result of controllable water quality factors.	All inland surface waters
Radioactivity	Shall not exceed the California Code of Regulations, Title 22, standards of 5 pCi/L for combined radium-226 and radium-228, 15 pCi/L for gross alpha, 20,000 pCi/L for tritium, 8 pCi/L for strontium-90, 50 pCi/L for gross beta, and 20 pCi/L for uranium.	MUN beneficial use designation

Table 3.10.1 Surface Water Quality Objectives for Inland Surface Waters

Constituent	Concentration	Receiving Waters
Solids (suspended and settleable)	Shall not cause nuisance or adversely affect beneficial uses.	All inland surface waters
Sulfides	Shall not be increased as a result of controllable water quality factors.	All inland surface waters
Surfactants	Waste discharges shall not contain concentrations of surfactants that result in foam in the course of flow or use of the receiving water or that adversely affect aquatic life.	All inland surface waters
Taste and odor	Shall not contain taste- or odor-producing substances at concentrations that cause a nuisance or adversely affect beneficial uses.	All inland surface waters
Temperature	Shall not be raised above 90°F June through October or above 78°F during the rest of the year as a result of controllable water quality factors.	WARM beneficial use designation
	Shall not be increased by more than 5°F as a result of controllable water quality factors.	COLD beneficial use designation
Toxic substances	Shall not be discharged at levels that will bioaccumulate in aquatic resources to levels that are harmful to human health. Concentrations of toxic pollutants in the water column, sediments, or biota shall not adversely affect beneficial uses.	All inland surface waters
Turbidity	Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20 percent. Where natural turbidity is between 50 and 100 JTU, increases shall not exceed 10 NTU. Where natural turbidity is greater than 100 NTU, increases shall not exceed 10 percent.	All inland surface waters

Source: *Water Quality Control Plan for the Santa Ana River Basin* (RWQCB, Santa Ana Region, February 2008).

°F = degrees Fahrenheit
Basin Plan = RWQCB, Santa Ana Region, Water Quality Control Plan for the Santa Ana River Basin
COLD = cold freshwater habitat
JTU = Jackson turbidity units
mg/L = milligrams per liter
mL = milliliters
MUN = municipal water supply
N = nitrogen
NO_3 = nitrate
NTU = nephelometric turbidity units
pCi/L = picocuries per liter
pH = percentage of hydrogen
REC-1 = contact water recreation
REC-2 = noncontact water recreation
RWQCB = California Regional Water Quality Control Board
WARM = warm freshwater habitat

- Total dissolved solids (TDS): 650 milligrams/liter (mg/L)

The Santa Ana River, Reach 3, has the following site-specific numeric water quality objectives:

- TDS: 700 mg/L
- Hardness: 350 mg/L
- Sodium: 110 mg/L
- Chloride: 140 mg/L
- Total inorganic nitrogen: 10 mg/L
- Sulfate: 150 mg/L
- Chemical oxygen demand: 30 mg/L

The following site-specific numeric water quality objectives are applicable to the Santa Ana River, Reaches 2 and 3, and Temescal Wash:

- Ammonia: 0.098 mg/L ammonia nitrogen (NH_3-N)
- Cadmium: 4 micrograms/liter (µg/L)
- Copper: 37 µg/L
- Lead: 28 µg/L

3.10.2.6 Water Quality Impairments

Regional Water Quality

In general, the quality of surface water and groundwater in the Santa Ana River Watershed becomes progressively poorer as water moves downstream. The highest quality water is typically associated with tributaries flowing from the surrounding mountains and groundwater recharged by those streams. Water quality is affected by a number of factors including consumptive use, importation of water high in dissolved solids, runoff from urban and agricultural areas, and the recycling of water within the basin.

The most important regional issue in the Santa Ana River Watershed is the degradation of water quality by nitrogen and TDS. Historically, the Santa Ana River and its major tributaries flowed year-round; however, diversion for irrigation has resulted in decreased flow and groundwater recharge. Primary water quality concerns in the Middle Santa Ana River include TDS, total inorganic nitrogen levels, and contaminant plumes in groundwater; bacterial quality of surface waters; and impacts from concentrated animal-feeding operations.

Surface Water Quality

The United States Geological Survey (USGS) maintains several gauging stations in the Santa Ana River. However, most of the data collected at those stations are discharge measurements. Water quality measurements collected at Gage 11074000 in the Santa Ana River below Prado Dam for selected constituents are summarized in Table 3.10.2. The data are summarized as averages by water year, which is defined by the USGS as October through September. These measured values are within the water quality objectives for this reach of the Santa Ana River that were provided earlier in Section 3.10.2.5, Surface Water Quality Objectives.

Section 303(d) Listed Waters

Santa Ana River Reach 3 is listed as impaired for lead, copper, and pathogens in the SWRCB *2010 Integrated Report* (approved on August 4, 2010). In addition,

Table 3.10.2 Average Santa Ana River Water Quality by Water Year (October through September)

Constituent	Units	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007
Alkalinity	mg/L	187.2	177.6	191.5	202.8	177.1	186.3	193.5	199.8	205
Ammonia	mg/L as N	0.3	0.2	0.3	0.06	0.1	0.07	0.14	0.11	0.06
Calcium	mg/L	71.0	65.2	70.0	--	--	--	--	--	--
Chloride	mg/L	91.0	93.5	100.6	107.9	--	97.8	95.7	108.3	117.9
Dissolved organic carbon	mg/L	5.9	5.8	4.8	--	--	--	--	--	--
Dissolved oxygen	mg/L	9.4	8.7	8.7	9.0	8.7	8.9	9.5	9.8	9.9
Fluoride	mg/L	0.4	0.4	0.4	--	--	--	--	--	--
Hardness	mg/L as $CaCO_3$	244.7	229.3	244.5	--	--	--	--	--	--
Iron	µg/L	15.1	16.4	15.6	--	--	--	--	--	--
Magnesium	mg/L	16.6	16.1	16.9	--	--	--	--	--	--
Manganese	µg/L	96.7	73.0	76.2	--	--	--	--	--	--
Nitrate+nitrite	mg/L as N	6.5	5.0	5.0	5.3	3.6	4.3	3.9	5.1	5.4
Nitrite	mg/L as N	0.09	0.08	0.11	0.07	0.09	0.13	0.07	.06	0.05
Ortho-phosphate	mg/L as P	0.8	0.7	0.8	0.78	0.6	0.52	0.58	0.68	0.92
pH	pH units	8.1	8.1	8.0	8.1	8.1	8.1	8.1	8.1	8.2
Phosphorus	mg/L as P	1.3	1.2	1.0	0.89	0.9	0.74	0.69	0.91	1.2
Potassium	mg/L	10.2	9.5	10.6	--	--	--	--	--	--
Silica	mg/L	20.0	18.4	19.5	--	--	--	--	--	--
Sodium	mg/L	79.1	80.0	86.9	--	--	--	--	--	--
Specific conductance	µs/cm	932.8	896.9	911.1	943.4	817.4	884.3	855.4	921.8	1,019
Sulfate	mg/L	96.7	92.1	96.9	100.6	81.7	88.0	92.4	104.5	109.0
Temperature	°C	17.8	18.8	18.5	18.2	18.5	18.8	18.5	18.5	19.0
Total dissolved solids	mg/L	541.4	506.6	541.7	--	--	--	--	--	--
Total suspended organic carbon	mg/L	2.1	1.9	3.0	--	--	--	--	--	--
Zinc	µg/L	20.8	41.3	16.7	--	--	--	--	--	--

Source: United States Geological Survey, *Water Quality Data Reports, 1994–1997.*
$CaCO_3$ = calcium carbonate
°C = degrees Celsius
µg/L = micrograms per liter
mg/L = milligrams per liter
N = nitrogen
P = phosphorus
pH = percentage of hydrogen

Temescal Creek Reach 1 is listed as impaired for pH. The *2010 Integrated Report* includes changes to the 2006 CWA Section 303(d) list of impaired water bodies and CWA Section 305(b) report on the quality of waters in California. On November 12, 2010, the EPA approved the State's inclusion of all waters and pollutants that the State identified as requiring a TMDL and they disapproved the State's omission of several water bodies and associated pollutants that meet federal listing requirements.

On October 11, 2011, the EPA approved the final list of impaired water bodies. The EPA added Santa Ana River Reach 2 to the list of impaired waters as impaired for indicator bacteria and Reach 3 for lead.

A resolution to amend the Basin Plan to include a TMDL for bacterial indicators was approved by the Santa Ana RWQCB on September 1, 2006, and the EPA on May 16, 2007 (Resolution No. R8-2005-001). This TMDL is applicable to Reach 3 of the Santa Ana River. In addition, a TMDL is currently under development for nutrients for Reach 3 of the Santa Ana River.

3.10.2.7 Groundwater Resources

As designated in the Basin Plan, the project site is within the Orange County Groundwater Management Zone of the Lower Santa Ana River Basin and the Temescal, Arlington, and Bedford Groundwater Management Zones of the Middle Santa Ana River Basin, as shown on Figure 3.10-2. Groundwater basins were redesignated as Groundwater Management Zones by the Santa Ana RWQCB in the February 2008 Basin Plan.

Near Prado Dam, the study area is bordered by the Prado Basin Surface Water Management Zone. The floodplain behind Prado Dam has unique hydraulic characteristics. Flood control operations at the dam, coupled with an extremely shallow groundwater table and an unusually thin aquifer, affect subsurface flows in the area. Depending on how the dam is operated, surface waters may or may not percolate behind the dam. There is little or no groundwater storage in the floodway behind the dam. Any groundwater in storage is forced to the surface because the foot of Prado Dam extends to bedrock, and subsurface flows cannot pass through the barrier created by the dam and the surrounding hills. As a result, this area is designated as a surface water management zone rather than a groundwater management zone.

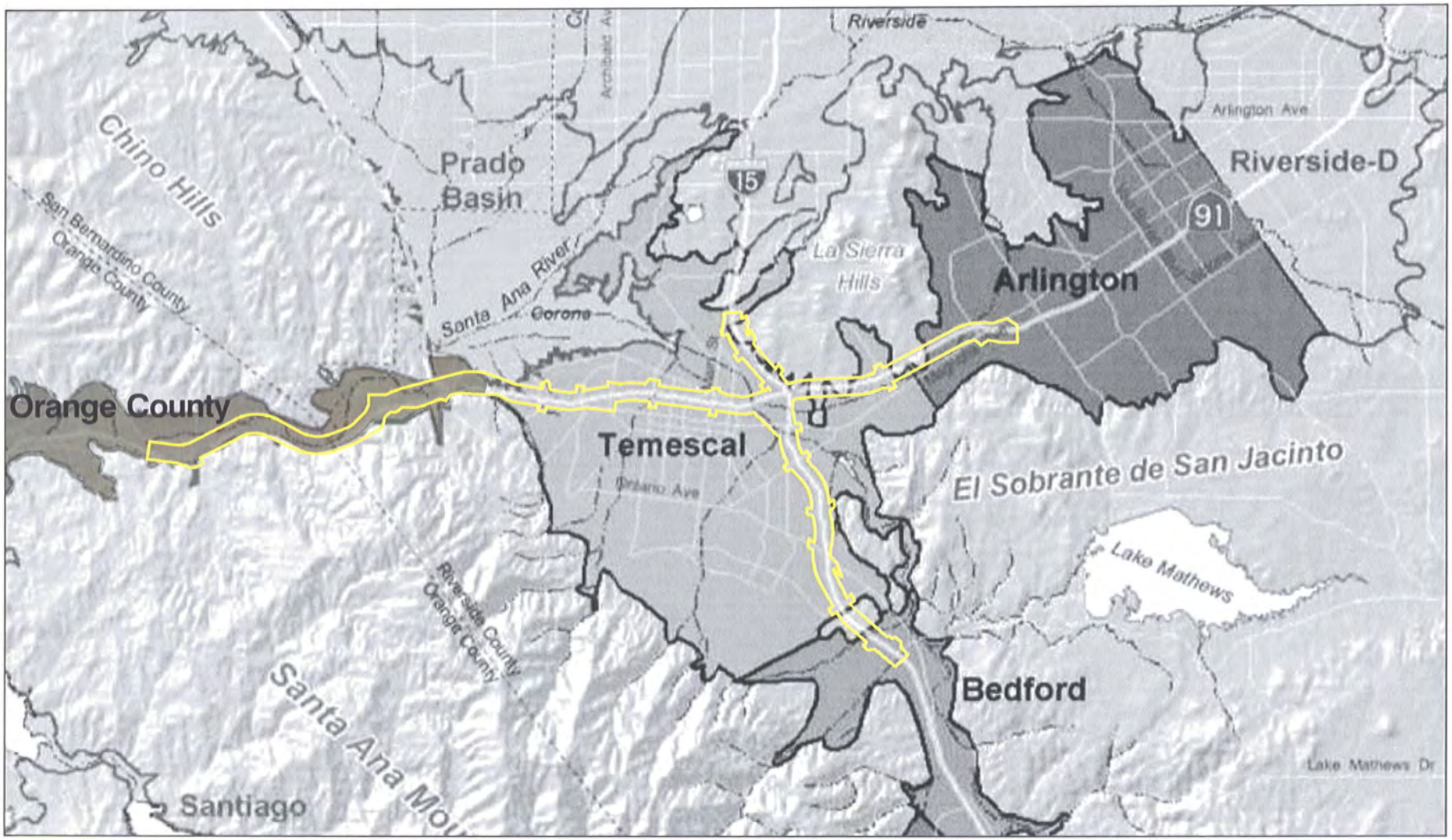

FIGURE 3.10-2

LEGEND

- SR-91 Study Area

0 1.5 3
MILES

SOURCE: California Regional Water Quality Control Board, Santa Ana Region.
Water Quality Control Plan, Santa Ana River Basin. Updated February 2008.

SR-91 Corridor Improvement Project
Groundwater Management Zones
Ora-91-R14.43/R.18.19
Riv-91-R.0.00/R13.04
Riv-15-35.64/45.14
EA# 0F540

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The Orange County Groundwater Management Zone underlies a coastal alluvial plain in northwest Orange County. This groundwater management zone is bounded by consolidated rocks exposed on the northeast in the Chino Hills, on the north in the Coyote Hills, and on the east in the Santa Ana Mountains; by SR-55 and the Irvine Groundwater Management Zone on the southeast; the Pacific Ocean on the southwest; and a low topographic divide at approximately the Orange County/ Los Angeles County line and Coyote Creek on the northwest. This groundwater management zone is recharged by percolation of Santa Ana River flow, infiltration of precipitation, and injection wells.

The Arlington Groundwater Management Zone underlies part of the Santa Ana River Valley in northwest Riverside County. This groundwater management zone is bounded by impermeable rocks of the El Sobrante de San Jacinto Mountains on the south, the La Sierra Hills on the west and northwest, the Riverside-D Groundwater Management Zone on the east, and the Chino 5 Groundwater Management Zone on the north. This groundwater management zone is replenished by infiltration from Santa Ana River flow, return irrigation flow, and deep percolation of precipitation.

The Temescal Groundwater Management Zone underlies the southwest part of the upper Santa Ana Valley. This groundwater management zone is bounded on the north by the Prado Basin Surface Water Management Zone, on the east by non-water-bearing crystalline rocks of the El Sobrante de San Jacinto Mountains and La Sierra Hills, on the west by the Santa Ana Mountains, and on the south by the Bedford Groundwater Management Zone. Dominant recharge to this groundwater reservoir is from percolation of precipitation on the valley floor and infiltration of stream flow within tributaries exiting the surrounding mountains and hills.

The southern tip of the study area along I-15 is in the north part of the Bedford Groundwater Management Zone. The Bedford Groundwater Management Zone is bounded by the Temescal Groundwater Management Zone on the north, the Santa Ana Mountains on the west, the El Sobrante de San Jacinto Mountains on the east, and Lee Lake on the south. The part of the study area in the Bedford Groundwater Management Zone consists of areas for advanced signage only.

The depth to groundwater along the alignments of SR-91 and I-15 varies from approximately 10 ft to greater than 110 ft. During past bridge construction, groundwater has been encountered at depths as shallow as approximately 11 ft below ground surface (bgs) at the SR-91 Promenade Avenue Overcrossing to as deep as

approximately 110 ft bgs at the I-15/Ontario Avenue Overcrossing. Groundwater depths in the area of the I-15/Ontario Avenue and I-15/El Cerrito Road overcrossings are 50 and 30 ft bgs, respectively. In general, the parts of the study area with historic depths to groundwater less than 50 ft bgs extend from Santa Ana Canyon to approximately Research Drive in the City of Corona, near the I-15/SR-91 interchange, and the vicinity of Pierce Street.

Groundwater levels are subject to seasonal fluctuations and may vary over time. Local perched groundwater or surface water may also occur during or following periods of intense rainfall. There are no sole source aquifers in the project area.

Segment A is located in a high risk area, which is defined as a location where spills from the State-owned rights-of-way, activities, or facilities can discharge directly to municipal or domestic water supply reservoirs or groundwater percolation facilities. The Orange County Water District (OCWD) maintains several groundwater recharge basins along the Santa Ana River downstream of Segment A. Runoff from SR-91 discharges directly into the Santa Ana River and is therefore considered a high risk area. There are no high risk areas along Segments B and C.

3.10.2.8 Beneficial Uses for Groundwater

The beneficial uses for groundwater identified in the Basin Plan for the Orange County, Arlington, Bedford, and Temescal Groundwater Management Zones are:

- Municipal
- Agricultural
- Industrial
- Process water supply

3.10.2.9 Groundwater Quality Objectives

The groundwater quality objectives for the Santa Ana Region as designated in the Basin Plan are provided in Table 3.10.3.

There are no site-specific groundwater objectives for the Bedford Groundwater Management Zone. The site-specific groundwater objectives for the other three groundwater management zones in the study area are:

- **Orange County Groundwater Management Zone**
  - TDS: 910 mg/L
  - Nitrate as nitrogen: 5.9 mg/L

Table 3.10.3 Groundwater Quality Objectives for Groundwater Management Zones

Constituent	Concentration	Area
Arsenic	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Boron	Shall not exceed 0.75 mg/L as a result of controllable water quality factors.	Santa Ana Region
Chloride	Shall not exceed 500 mg/L as a result of controllable factors.	MUN beneficial use designation
Coliform (total)	Shall not exceed 2.2 organisms/100 mL median over any 7-day period as a result of controllable water quality factors.	MUN beneficial use designation
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses.	Santa Ana Region
Cyanide	Shall not exceed 0.2 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Fluoride	Shall not exceed 1.0 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Hardness	Shall not be increased as a result of waste discharges to levels that adversely affect beneficial uses.	MUN beneficial use designation
Oil and grease	Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations that cause a nuisance or adversely affect beneficial uses.	Santa Ana Region
Barium	Shall not exceed 1.0 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Cadmium	Shall not exceed 0.01 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Chromium	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Cobalt	Shall not exceed 0.2 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Copper	Shall not exceed 1.0 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Iron	Shall not exceed 0.3 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Lead	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Manganese	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Mercury	Shall not exceed 0.002 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Selenium	Shall not exceed 0.01 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Silver	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Methylene blue-activated substances	Shall not exceed 0.05 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
pH	The pH of groundwater shall not be raised above 9 or depressed below 6 as a result of controllable water quality factors.	Santa Ana Region
Radioactivity	Shall not exceed the California Code of Regulations, Title 22, standards of 5 pCi/L for combined radium-226 and radium-228, 15 pCi/L for gross alpha, 20,000 pCi/L for tritium, 8 pCi/L for strontium-90, 50 pCi/L for gross beta, and 20 pCi/L for uranium.	MUN beneficial use designation
Sodium	Shall not exceed a sodium absorption rate of 9.	AGR beneficial use designation
Sulfate	Shall not exceed 500 mg/L as a result of controllable water quality factors.	MUN beneficial use designation
Taste and odor	Groundwater shall not contain taste- or odor-producing substances in concentrations that adversely affect beneficial uses.	Santa Ana Region
Toxic substances	All waters shall be maintained free of substances in concentrations that are toxic or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	Santa Ana Region

Source: *Water Quality Control Plan for the Santa Ana River Basin* (RWQCB, Santa Ana Region, February 2008).
AGR = agricultural water supply
MUN = municipal water supply
RWQCB = California Regional Water Quality Control Board
pCi/L = picocuries per liter
mg/L = milligrams per liter
pH = percentage of hydrogen

- **Temescal Groundwater Management Zone**
  - TDS: 770 mg/L
  - Nitrate as nitrogen: 10 mg/L
- **Arlington Groundwater Management Zone**
  - TDS: 980 mg/L
  - Nitrate as nitrogen: 10 mg/L

As discussed previously, the Prado Basin Surface Water Management Zone is generally defined as a surface water feature within the Prado Basin. For the purpose of regulating discharges that would affect the Prado Basin Surface Water Management Zone and downstream waters, the water quality objectives established for surface waters that flow in the Prado Basin Surface Water Management Zone apply. Those objectives were discussed in Section 3.10.2.5.

Groundwater Quality

Water in the study area is primarily sodium-calcium bicarbonate-based. TDS in the Orange County Groundwater Management Zone range from 232 to 661 mg/L and average 475 mg/L. Groundwater in this groundwater management zone is impaired by increasing salinity, high nitrates, and methyl tertiary-butyl ether (MTBE).

Groundwater in the Temescal Groundwater Management Zone has elevated nitrate concentrations and an average TDS concentration of 790 mg/L. TDS within the Arlington Groundwater Management Zone range from 320 to 756 mg/L.

3.10.3 Environmental Consequences

3.10.3.1 Summary of Impacts

Pollutants of concern during operation of a transportation facility include sediments, trash, and debris that can be generated from facility maintenance activities as well as vehicles operating on the facility. Increased impervious areas associated with new freeway facilities increase the volume of runoff during a storm, which more effectively transports pollutants to receiving waters and may lead to downstream erosion. The Alternative 1 Ultimate Project would increase the impervious surface area in the study area by 117 ac (i.e., 27.0 percent) compared to the existing freeway facilities. The Alternative 2 Ultimate Project would increase the impervious surface area by 173 ac, a 39.6 percent increase, compared to the existing freeway facilities. As part of the project, BMPs will be implemented to target constituents of concern in runoff from the additional freeway facilities. Drainage from the newly added freeway facilities would be treated by biofiltration swales, infiltration basins, detention basins,

and/or media filters. All the runoff from the new net impervious surface area would be treated by the BMPs. BMPs would be implemented in accordance with NPDES Permit requirements; therefore, the operation of Alternatives 1 and 2 would not result in substantial adverse water quality impacts based on compliance with the applicable permits.

During construction of the Alternative 1 and 2 Ultimate Projects, excavated soil would be exposed and there would be increased potential for soil erosion compared to existing conditions. Additionally, during a storm event, soil erosion could occur at an accelerated rate. There is also potential for construction-related pollutants to be discharged into storm drains and surface waters during construction. The total area estimated to be disturbed during construction of the Alternative 1 Ultimate Project is approximately 351 ac. The total soil area estimated to be disturbed during construction of the Alternative 2 Ultimate Project is approximately 503 ac. Construction BMPs would be properly designed, implemented, and maintained. Therefore, no substantial adverse water quality impacts would occur during construction of the Alternative 1 or 2 Ultimate Project.

The Initial Phases of Alternatives 1 and 2 would result in a smaller increase in impervious surfaces than under the Ultimate Projects. As a result, the Initial Phases of Alternatives 1 and 2 would result in a smaller increase in runoff than under the Ultimate Alternatives. BMPs will be constructed in the Initial Phases to treat runoff from the freeway facilities.

The construction of the Initial Phases of Alternatives 1 and 2 would result in exposure of less excavated soil to the potential for soil erosion than would occur under the Ultimate Projects. Construction BMPs would be included in the Initial Phases of Alternatives 1 and 2.

Summary of Impacts of Alternative 2f

Alternative 2f has been identified as the Preferred Alternative. The Initial Phase of Alternative 2f would increase the impervious surface area by 110 ac compared to the existing freeway facilities. The Ultimate Project under Alternative 2f would increase the impervious surface area an additional 63 ac (for a total of 173 ac) compared to the existing freeway facilities.

The total area estimated to be disturbed during the construction of the Initial Phase of Alternative 2f would be approximately 305 ac, and the additional area estimated to be

disturbed for the Ultimate Project under Alternative 2f would be approximately 198 ac (for a total of 503 ac).

As discussed above for Alternatives 1 and 2, BMPs would be implemented in accordance with NPDES Permit requirements for Alternative 2f (Initial Phase and Ultimate Project). A Construction General Permit that includes a SWPPP would be prepared and implemented during construction of Alternative 2f (Initial Phase and Ultimate Project). Groundwater and any other non-storm-water dewatering activities will be subject to the requirements of the De Minimus Permit and discharge authorization letter from the RWQCB Executive Director; therefore, no substantial adverse water quality impacts would occur during construction and operation of Alternative 2f (Initial Phase and Ultimate Project).

Alternative 2f includes the implementation of construction and permanent BMPs in the Initial Phase and Ultimate Project. Permanent BMPs constructed in the Initial Phase would be constructed to accommodate Ultimate Project conditions. None of the BMPs constructed during the Initial Phase would require relocation to accommodate the Ultimate Project improvements. The BMPs that would be provided in the Initial Phase and Ultimate Project for Alternative 2f are listed in Tables 3.10.4 and 3.10.5, respectively.

Table 3.10.4 Treatment BMP Estimated Quantities for the Initial Phase of Alternative 2f

Project Segment	Biofiltration Swales/Strips Each	Infiltration Devices Each	Detention Devices Each	Media Sand Filters Each
1	7	5	5	5
2	4	6	7	10
3	1	1	1	1
Total	**12**	**12**	**13**	**16**

Source: *Project Report* (2012).

Table 3.10.5 Treatment BMP Estimated Quantities for the Alternative 2f Ultimate Project

Project Segment	Biofiltration Swales/Strips Each	Infiltration Devices Each	Detention Devices Each	Media Sand Filters Each
1	12	6	7	7
2	10	9	11	14
3	2	2	3	2
Total	**24**	**17**	**21**	**23**

Source: *Project Report* (2012).

3.10.3.2 Permanent Impacts

Sediments, Turbidity, and Floating Materials

Increased impervious areas associated with new freeway facilities in turn increase the volume of runoff during a storm, which transports pollutants to receiving waters and may lead to downstream erosion or impairment of water quality objectives. In addition, as the amounts of impervious surfaces and runoff increase, less water is able to infiltrate into the ground. Infiltration allows water to travel more slowly to creeks and streams, which helps sustain flows through drier periods and supports aquatic life. Water that travels too quickly to creeks and streams can pick up and carry more sediment and other pollutants, thereby impairing that body's water quality. In addition, the water may also hit creeks and streams in a rush, which could result in erosion and flooding. Water that infiltrates through the ground gets filtered by natural processes before it reaches the receiving water body. Compared with existing conditions, there would be a slight increase in runoff volumes due to the addition of new impervious areas from the freeway improvements under Alternatives 1 and 2. Such increases would generally shorten the time of concentrations and runoff travel time to the Santa Ana River. However, because the flow increase to the Santa Ana River is expected to be minimal, the hydrologic impact is considered negligible.

Alternatives 1 and 2 would result in a permanent increase of impervious surfaces and a permanent increase in runoff and pollutant loading, including sediments, trash, and debris. As shown in Table 3.10.6, Alternative 1 would increase the impervious surface area in the study area by 117 ac (i.e., 27.0 percent) compared to the existing freeway facilities. Water quality impacts related to sediment, turbidity, and floating materials during operation of the Initial Phase of Alternative 1 would be similar to those discussed above for Alternative 1. However, the increase in impervious surface area, and therefore the increase in runoff and pollutant loading, would be less than under Alternative 1. Because a detailed phasing plan for the Initial Phase of Alternative 1 has not been developed, the new impervious surface area for the phasing cannot be quantified.

Table 3.10.6 Existing and New Impervious Areas for Alternatives 1 and 2

Build Alternatives	Existing Impervious Area (acres)	Net New Impervious Area (acres)	Increase in Impervious Area (%)
Alternative 1	436.6	117	27.0
Alternative 2	437.0	173	39.6

Source: *Final Water Quality Assessment Report (May 2010)*.

As shown in Table 3.10.6, Alternative 2 would increase the impervious surface area by 173 ac, a 39.6 percent increase, compared to the existing freeway facilities. Because the increase in impervious surface would be greater under Alternative 2, the increase in runoff and pollutant loading under Alternative 2 would also be greater than under Alternative 1. Water quality impacts during the operation of the Initial Phase of Alternative 2 would be similar to those discussed above for Alternative 2. The Initial Phase of Alternative 2 would increase the impervious surface area by 110 ac, which is less than the impervious surface area increase of the Alternative 2 Ultimate Project (173 ac). The increase in impervious surface, and therefore the increases in runoff and pollutant loading, under the Alternative 2 Ultimate Project would be greater than the Initial Phase of Alternative 2.

The operation of Alternatives 1 and 2 will be subject to the requirements of the Department's NPDES Permit. Specifically, during project operation, the Department must (1) comply with the requirements of the 1999 Department Statewide NPDES Permit and any subsequent permit, (2) consider approved BMPs to treat the runoff from the project site, and (3) install these BMPs where feasible.

The Department has provisions to evaluate and monitor BMP effectiveness in the SWMP. The SWMP also lists provisions to replace a BMP with an alternative practice if monitoring finds the BMP is not performing as designed or expected. The Department recognizes the importance of maintenance and monitoring of BMPs after construction is complete.

Currently, runoff from SR-91 and I-15 in the study area is partially treated where runoff sheet flows to vegetated slopes and swales. As part of the project, BMPs would be implemented to target constituents of concern in runoff from the newly added freeway facilities (117 ac and 173 ac under Alternatives 1 and 2, respectively). The BMPs would also increase filtration, which would partially offset the increased runoff as a result of the increased impervious areas under Alternatives 1 and 2.

Drainage from the newly added freeway facilities would be treated by biofiltration swales, infiltration basins, detention basins, and/or media filters. All the runoff from the new net impervious surface areas would be treated by the BMPs. The BMPs would treat runoff from an area equivalent to the impervious surface area added by the project as well as runoff from part of the existing freeway facility. The potential BMP locations for Alternatives 1 and 2 and the Initial Phase of Alternative 2 are shown on Figures 3.10-3 and 3.10-4, respectively, and are also discussed in detail

below. Figures 3.10-3 and 3.10-4 are provided following the last page of text in this section to minimize disruptions for the reader.

- **Biofiltration Swales.** Biofiltration swales (bioswales) are vegetated channels that convey storm water and remove pollutants by filtration through grass, sedimentation, adsorption to soil particles, and infiltration through soil. Bioswales are effective at removing debris and solid particles, although some removal of dissolved constituents is also achieved.
- **Infiltration Basins.** Infiltration basins are designed to remove pollutants by capturing storm water runoff and infiltrating it directly to the soil, instead of discharging it to receiving waters. Infiltration basins remove a wider range of pollutants than detention basins. Pollutants removed by infiltration basins include total suspended solids (TSS), nutrients, pesticides, particulate metals, dissolved metals, pathogens, litter, biochemical oxygen demand, and TDS.
- **Detention Basins.** Detention basins are designed to reduce sediment and particulate loading in storm water runoff. Water is temporarily detained in a detention basin to allow sediment and particulates to settle out before the runoff is discharged to receiving waters. Detention basins typically detain water for 24 to 72 hours.
- **Media Filters.** Media filters are designed to remove TSS pollutants (sediments and metals) from runoff through sedimentation and filtration. They also effectively remove trash and dissolved metals. Austin sand filters are media filters that are open, at grade, and do not contain a permanent pool of water.

BMPs would be implemented in accordance with NPDES Permit requirements as described later in Measure WQ-3. They would be implemented in phases as the project improvements are implemented, with 100 percent of the net new impervious area treated for each phase as well as runoff from part of the existing freeway facility. Therefore, Alternatives 1 and 2 and the Initial Phases of Alternatives 1 and 2 would not result in substantial adverse water quality impacts related to sediments, turbidity, and floating materials.

No Build Alternative

Under the No Build Alternative, there would be no increase in impervious areas or changes in land use on SR-91 or I-15; however, the No Build Alternative would contribute to water quality objective impairments because the runoff from these facilities would continue to remain partially untreated where runoff sheet flows to vegetated slopes and swales.

Oil, Greases, and Chemical Contamination

In addition to sediments and trash, pollutants of concern during operation of a transportation facility include petroleum products, metals, nutrients, solvents, waste paint, herbicides, and pesticides. These pollutants of concern can be generated from maintenance activities as well as vehicles operating on the facility. New impervious areas associated with freeway facilities increase the volume of runoff during a storm, which more effectively transports pollutants to receiving waters and may lead to downstream erosion and impairment of water quality objectives and/or beneficial uses of receiving waters.

There would be a net increase in impervious areas under Alternatives 1 and 2 and the Initial Phases of Alternatives 1 and 2 that would result in an increase in the volume of runoff during a storm or a subsequent increase of pollutant loading (including petroleum products, metals, and chemicals) to receiving waters.

Alternative 1 would increase the impervious surface area by 117 ac compared to the existing freeway facility. That increase in impervious area would increase the volume of runoff during a storm, which would more effectively transport pollutants to receiving waters and potentially impair water quality objectives and/or beneficial uses. Water quality impacts during the operation of the Initial Phase of Alternative 1 would be similar to those for Alternative 1. However, the increase in impervious surface area and the increase in runoff and pollutant loading for the Initial Phase of Alternative 1 would be less than for Alternative 1. Because a detailed phasing plan for the Initial Phase of Alternative 1 has not been developed, the new impervious surface area for the Initial Phase of Alternative 1 cannot be quantified.

Alternative 2 would result in a greater net increase in impervious surface area than Alternative 1, with a total net increase of 173 ac compared to the existing freeway facilities. As a result, the increase in runoff and pollutant loading under Alternative 2 would be greater than under Alternative 1. Water quality impacts during operation of the Initial Phase of Alternative 2 would be similar to those discussed above for Alternative 2. The Initial Phase of Alternative 2 would increase the impervious surface area by 110 ac compared to existing conditions, which is less than the increase in impervious surface area under Alternative 2. The increase in impervious surface, and therefore the increase in runoff and pollutant loading, under Alternative 2 would be greater than under the Initial Phase of Alternative 2.

As discussed above, runoff from SR-91 and I-15 in the project limits is currently partially treated where runoff sheet flows to vegetated slopes and swales. As part of Alternatives 1 and 2, BMPs would be implemented to target constituents of concern in runoff from the newly added freeway facilities. Drainage from the newly added freeway facilities would be treated by biofiltration swales, infiltration basins, detention basins, and/or media filters as discussed earlier and as shown on Figure 3.10-3. All the runoff from the new net impervious surface area under Alternatives 1 and 2 would be treated by the BMPs as well as runoff from part of the existing freeway facility. The percentages of total runoff from new areas and the existing facility that would be treated under Alternative 1 are currently estimated at 125 percent in Segment A, 116 percent in Segment B, and 102 percent in Segment C.

The Department's roadway maintenance activities under Alternatives 1 and 2 would be similar to existing conditions. The new BMPs would require maintenance and would target pollutants of concern from maintenance activities (such as oil and grease). There would be fewer BMPs to maintain for the Initial Phases of Alternatives 1 and 2 compared to Alternatives 1 and 2; therefore, there would be less maintenance activities and a lower potential for spills or leaks of petroleum products. Alternative 2 would include construction of a greater number of BMPs compared to Alternative 1. This would increase maintenance activities and therefore increase the potential for spills or leaks of petroleum products. Therefore, Alternatives 1 and 2 and the Initial Phases of Alternatives 1 and 2 would not substantially increase the potential for pollutants associated with maintenance activities to impact water quality.

The potential for groundwater contamination of the nearby OCWD recharge basins along the Santa Ana River requires that appropriate spill containment and spill prevention control measures be incorporated into Alternatives 1 and 2. Spill containment and prevention control measures would be implemented in accordance with specific sections in the SWMP, including Section 3 for BMP identification and implementation and Section 4.4.1 for new construction projects.

In summary, Alternatives 1 and 2 and the Initial Phases of Alternatives 1 and 2 would not result in substantial adverse water quality impacts related to oil, grease, and chemical contamination.

No Build Alternative

Under the No Build Alternative, there would be no increase in impervious areas or changes in land use on SR-91 or I-15; however, the No Build Alternative would

contribute to water quality objective impairments because the existing runoff from these facilities would continue to remain partially untreated where runoff sheet flows to vegetated slopes and swales.

Changes in Temperature

Temperature is not typically considered a constituent of concern during operation of a transportation facility. Therefore, the operation of Alternatives 1 and 2 and the Initial Phases of Alternatives 1 and 2 is not expected to result in substantial long-term adverse water quality impacts related to temperature.

No Build Alternative

Temperature is not typically considered a constituent of concern during operation of a transportation facility. Therefore, the operation of SR-91 and I-15 under the No Build Alternative is not expected to result in substantial long-term adverse water quality impacts related to temperature.

3.10.3.3 Temporary Impacts

Sediments, Turbidity, and Floating Materials

The potential impacts of construction activities on water quality focus primarily on sediments, turbidity, and pollutants that might be associated with sediments (e.g., phosphorus and pesticides) and how these may impact water quality objectives and/or beneficial uses. Each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on water quality and impair water quality objectives and/or beneficial uses. Construction-related activities that are primarily responsible for sediment releases are related to exposing soils to potential erosion by rainfall/runoff and wind. Such activities include removal of vegetation and existing structures from the site, grading and excavation of the site, and construction of new road surfaces and structures. These activities can create the potential for sediment to be transported outside the project limits with storm water runoff and potentially impair water quality objectives and/or beneficial uses of receiving waters. Environmental factors that affect erosion include topographic, soil, and rainfall characteristics. Additionally, material from storage stockpiles and construction materials (e.g., asphalt, paving materials, concrete) could be transported into surface waters during storm events.

During construction of Alternatives 1 and 2, excavated soil would be exposed and there would be increased potential for soil erosion compared to existing conditions. Additionally, during a storm event, soil erosion could occur at an accelerated rate.

There is also the potential for construction-related pollutants to be discharged into storm drains and surface waters during construction and potentially impairing water quality objectives and/or beneficial uses of receiving waters. For instance, grading can generate sediment, which has the potential to be washed into storm drains and surface waters or tracked off site by construction trucks and heavy equipment.

The total area anticipated to be disturbed during the construction of Alternative 1 is estimated to be approximately 351 ac. The water quality impacts related to sediment, turbidity, and floating materials during construction of the Initial Phase of Alternative 1 would be similar to those discussed above for Alternative 1. However, the total soil area disturbed during construction of the Initial Phase of Alternative 1 would be less than disturbed by Alternative 1. Because a detailed phasing plan for Alternative 1 has not been developed, the disturbed soil area for the Initial Phase of Alternative 1 cannot be quantified.

Water quality impacts during the construction of Alternative 2 would be similar to those discussed above for Alternative 1. However, the total soil area disturbed during the construction of Alternative 2 would be approximately 503 ac, which is greater than the total disturbed area under Alternative 1. Water quality impacts during construction of the Initial Phase of Alternative 2 would be similar to those discussed above for Alternative 2. However, the total soil area disturbed during construction of the Initial Phase of Alternative 2 would be approximately 305 ac, which is less than Alternative 2 (503 ac).

The impacts due to erosion and sedimentation can be placed in three categories: degradation of aquatic and riparian ecosystems, pollutant transport, and erosion of land and sedimentation within waterways and public facilities (i.e., storm drains). Sediment can be detrimental to aquatic life (e.g., primary producers, benthic invertebrates, and fish) by interfering with photosynthesis, respiration, growth, reproduction, and oxygen exchange in water bodies. In addition, sediment particles can transport other pollutants that are attached to them including nutrients, trace metals, and hydrocarbons. Sediment particles such as silts and clays are the primary components of total suspended solids (TSS), a common water quality analytical parameter. In addition to impacts directly associated with sedimentation, various pollutants can also be transported along with sediment particles leaving construction sites. These pollutants often originate from organic components, plant residues, and nutrient elements within soils on the construction site, and are thus mobilized by erosion and later deposited downstream during sedimentation. Alternatively, these

other pollutants may be generated independent of erosion and, because of their nature, can have substantial detrimental effects on receiving waters.

There are several drainages in the study area that connect directly or indirectly to the Santa Ana River. The project would affect waters of the United States as a result of widening, modifying, or otherwise improving drainages and culverts to accommodate the widening of and improvements to SR-91. Prior to initiation of construction, a Permit will be obtained through the Corps pursuant to Section 404 of the CWA.

Streambed banks and adjacent riparian areas extending beyond the limits of the Corps jurisdiction are considered subject to CDFG jurisdiction. The project would affect waters of the State as a result of widening, modifying, or otherwise improving drainages and culverts to accommodate the widening of and improvements to SR-91. Prior to initiation of construction, a Streambed Alteration Agreement with the CDFG will be obtained.

The construction of Alternatives 1 and 2 would result in temporary effects to potential RWQCB jurisdictional areas; the RWQCB often asserts jurisdiction of these areas under the Porter-Cologne Act. Prior to initiation of construction, a CWA Section 401 Water Quality Certification from the RWQCB will be obtained.

Under the Construction General Permit, a SWPPP would be prepared and implemented, including implementing specific erosion and sediment control BMPs detailed in the SWPPP during construction activities. Appropriate construction site BMPs for work in high risk areas would be identified in the SWPPP and implemented during construction. Alternatives 1 and 2 may include, but not be limited to, the Construction Site BMPs listed in Table 3.10.7. Construction BMPs would be properly designed, implemented, and maintained, as described later in Measure WQ-1. Therefore, no substantial adverse water quality impacts related to sediment, turbidity, and floating materials would occur during the construction of Alternatives 1 and 2 and the Initial Phases of Alternatives 1 and 2.

No Build Alternative

Under the No Build Alternative, no improvements to SR-91 or I-15 other than routine road and bridge maintenance would be made. Therefore, the No Build Alternative would result in no short-term water quality impacts related to sediments, turbidity, and floating materials from construction-related activities.

Table 3.10.7 Construction Site BMPs for Alternatives 1 and 2

Category of BMPs	BMP No.	BMP Name
Temporary soil stabilization	SS-1	Scheduling
	SS-2	Preservation of existing vegetation
	SS-4	Hydroseeding
	SS-5	Soil binders
	SS-7	Geotextiles, plastic covers, and erosion control blankets/mats
	SS-9	Earth dikes/drainage swales, and lined ditches
	SS-10	Outlet protection/velocity dissipation devices
	SS-11	Slope drains
Temporary sediment control	SC-1	Silt fence
	SC-3	Sediment trap
	SC-4	Check dam
	SC-5	Fiber rolls
	SC-6	Gravel bag berm
	SC-7	Street sweeping and vacuuming
	SC-10	Storm drain inlet protection
Wind erosion control	WE-1	Wind erosion control
Tracking control	TC-1	Stabilized construction entrance/exit
	TC-2	Stabilized construction roads
Non-storm water control	NS-3	Paving and grinding operations
	NS-4	Temporary stream crossing
	NS-5	Clear water diversion
	NS-8	Vehicle and equipment cleaning
	NS-9	Vehicle and equipment fueling
	NS-10	Vehicle and equipment maintenance
	NS-13	Material and equipment use over water
Waste management and material pollution control	WM-1	Material delivery and storage
	WM-2	Material use
	WM-3	Stockpile management
	WM-4	Spill prevention and control
	WM-5	Solid waste management
	WM-6	Hazardous waste management
	WM-7	Contaminated soil management
	WM-8	Concrete waste management
	WM-9	Sanitary/septic waste management

Sources: *Final Water Quality Assessment Report* (May 2010).
BMPs = best management practices
SR-91 CIP = State Route 91 Corridor Improvement Project

Oil, Greases, and Chemical Contamination

Non-sediment-related pollutants of concern during construction include waste construction materials; chemicals, liquid products, and petroleum products (such as paints, solvents, and fuels) used in construction or the maintenance of heavy equipment; and concrete-related waste streams. These construction-related pollutants may be spilled, leaked, or transported via storm runoff into receiving waters and may potentially impair water quality objectives and/or beneficial uses.

During construction of Alternative 1, there is a potential for construction-related pollutants to be discharged into storm drains and surface waters, thereby potentially

impairing the water quality objectives and/or beneficial uses of receiving waters. Oil and grease have the potential to be leaked during operation and maintenance of heavy equipment on site during construction. In addition, various chemicals used during construction have the potential to be spilled or leaked, thereby potentially impairing the water quality objectives and/or beneficial uses of receiving waters. Water quality impacts related to oil, grease, and chemical contamination during construction of the Initial Phase of Alternative 1 would be similar to those discussed above for Alternative 1. However, there would be less construction activities under the Initial Phase of Alternative 1 compared to Alternative 1, which would result in a lower potential for spills or leaks of oil, grease, or chemicals.

Water quality impacts during construction of Alternative 2 would be similar to those discussed above for Alternative 1. However, there would be more construction activity under Alternative 2 compared to Alternative 1, which would increase the potential for spills or leaks of oil, grease, or chemicals. Water quality impacts during the construction of the Initial Phase of Alternative 2 would be similar to those discussed above for Alternative 2. However, there would be less construction activities under the Initial Phase of Alternative 2 compared to Alternative 1, which would result in a lower potential for spills or leaks of oil, grease, or chemicals.

As discussed earlier, under the General Construction Activity NPDES Permit, a SWPPP would be prepared and implemented, including implementing specific construction site BMPs detailed in the SWPPP during construction activities. Measures to control spills, leakage, and dumping during construction would be addressed by structural and nonstructural BMPs. Construction BMPs would be properly designed, implemented, and maintained as presented in Measure WQ-1. Therefore, no substantial adverse water quality impacts related to oil, grease, and chemical contamination would occur during construction of Alternatives 1 and 2, and the Initial Phases of Alternatives 1 and 2.

Dewatering may be necessary to construct structure footings under Alternatives 1 and 2. Dewatered groundwater may contain high levels of TDS, salinity, high nitrates, or other contaminants. Groundwater and any other non-storm-water dewatering activities are subject to the requirements of the De Minimus Permit (Order No. R8-2009-0003), which covers discharge of groundwater and non-storm-water construction waste in the Santa Ana Region. This permit requires monitoring of dewatering discharges and adherence to effluent and receiving water limitations in the permit so that the water quality of surface waters is ensured protection. Compliance

with this permit, as described later in Measure WQ-2, would minimize the potential for substantial adverse water quality impacts of Alternatives 1 and 2 during dewatering.

No Build Alternative

Under the No Build Alternative, no improvements to SR-91 or I-15 other than routine road and bridge maintenance would be conducted. Therefore, the No Build Alternative would result in no short-term water quality impacts related to oil, greases, and chemical contamination from construction-related activities.

Changes in Temperature

Water detained on construction sites has the potential to reach ambient air temperature, which would increase the temperature of surface waters if discharged during storm events and potentially impair the water quality objectives and/or beneficial uses of receiving waters. In addition, non-storm-water discharges (such as groundwater dewatering activities) have the potential to change surface water temperatures and potentially impair the water quality objectives and/or beneficial uses of receiving waters.

As noted earlier, dewatering may be necessary to construct structure footings for Alternatives 1 and 2. Dewatered groundwater may differ in temperature from the receiving waters. Water quality impacts related to temperature during construction of the Initial Phases of Alternatives 1 and 2 would be similar to those for Alternatives 1 and 2. However, because less dewatering activities would be required under the Initial Phases of Alternatives 1 and 2 compared to Alternatives 1 and 2, potential water quality impacts related to temperature would be less.

Groundwater and any other non-storm-water dewatering activities under Alternatives 1 and 2 will be subject to the requirements of the De Minimus Permit (Order No. R8-2009-0003). This permit requires dischargers to monitor dewatering discharges and adhere to effluent and receiving water limitations contained within the permit so that the water quality of surface waters is ensured protection. Compliance with this permit, as discussed later in Measure WQ-2, would minimize water quality impacts related to temperature under Alternatives 1 and 2 during dewatering.

No Build Alternative

Under the No Build Alternative, no improvements to SR-91 or I-15 other than routine road and bridge maintenance would be made. Therefore, the No Build Alternative

would result in no short-term water quality impacts related to temperature from construction-related activities.

3.10.4 Avoidance, Minimization, and/or Mitigation Measures

The Department SWMP is the guidance for compliance with the NPDES Permit requirements for discharge. As part of the Department Project Delivery Storm Water Management Program described in the SWMP, selected Construction Site, Design Pollution Prevention, and Treatment BMPs will be incorporated into the final design of the project. Compliance with the standard requirements of the SWMP and NPDES permits, listed below in measures WQ-1, WQ-2, and WQ-3, would minimize the potential substantial short- and long-term adverse impacts of Alternatives 1 and 2 and their design variations related to water quality. The following measures would be required for the Initial Phases and Ultimate Projects under the SR-91 CIP Build Alternatives.

WQ-1 Prior to and during construction, RCTC's Resident Engineer will require the design/build contractor to comply with the provisions of the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, NPDES No. CAS000002), and any subsequent permit, as they relate to the project construction activities. This will include submission of the Permit Registration Documents, including an NOI, risk assessment, site map, SWPPP, annual fee, and signed certification statement to the SWRCB at least 14 days prior to the start of construction activity. The SWPPP will meet the requirements of the Construction General Permit and will identify potential pollutant sources associated with construction activities; identify non-storm water discharges; develop a water quality monitoring and sampling plan; and identify, implement, and maintain BMPs to reduce or eliminate pollutants associated with the construction site. The BMPs identified in the SWPPP will be implemented during project construction. An NOT will be submitted to the SWRCB on the completion of construction and the stabilization of the site. RCTC's Resident Engineer will also require the design/build contractor to implement SWRCB Resolution No. 2001-046 requiring sampling and analysis during project construction.

WQ-2 Prior to and during construction, RCTC's Resident Engineer will require the design/build contractor to comply with the provisions of the General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality, Order No. R8-2009-0003, NPDES No. CAG998001, as they relate to discharge of non-storm-water dewatering wastes for the project. This will include submitting to the Santa Ana RWQCB an NOI at least 60 days prior to the start of construction, notification of discharge at least 5 days prior to any planned discharges, and monitoring reports by the 30th day of each month following the monitoring period.

WQ-3 Prior to dewatering activities, RCTC's Resident Engineer will provide the design/build contractor with a copy of the discharge authorization letter issued by the RWQCB Executive Director.

WQ-4 Prior to and during construction, RCTC's Resident Engineer will require the design/build contractor to follow the procedures outlined in the Caltrans Storm Water Quality Handbooks, Project Planning and Design Guide (July 2010 or subsequent issuance) for implementing Design Pollution Prevention and Treatment BMPs for the project. This will include coordination with the Santa Ana RWQCB with respect to the feasibility, maintenance, and monitoring of Treatment BMPs as set forth in the Department's Statewide SWMP (May 2003 or subsequent issuance). RCTC's Resident Engineer will also require the design/ build contractor to comply with other provisions identified in the NPDES Permit, Statewide Storm Water Permit, and Waste Discharge Requirements for the State of California, Department of Transportation (Order No. 99-06-DWQ, NPDES No. CAS000003). RCTC's Resident Engineer will also require the design/build contractor to comply with other provisions identified in the NPDES Permit and Waste Discharge Requirements for the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the incorporated cities of Riverside County within the Santa Ana Region (Order No. R8-2010-0033, NPDES No. CAS618033); and for the County of Orange, Orange County Flood Control District and the incorporated cities of Orange County within the Santa Ana Region (Order No. R8-2009-0030), as applicable.

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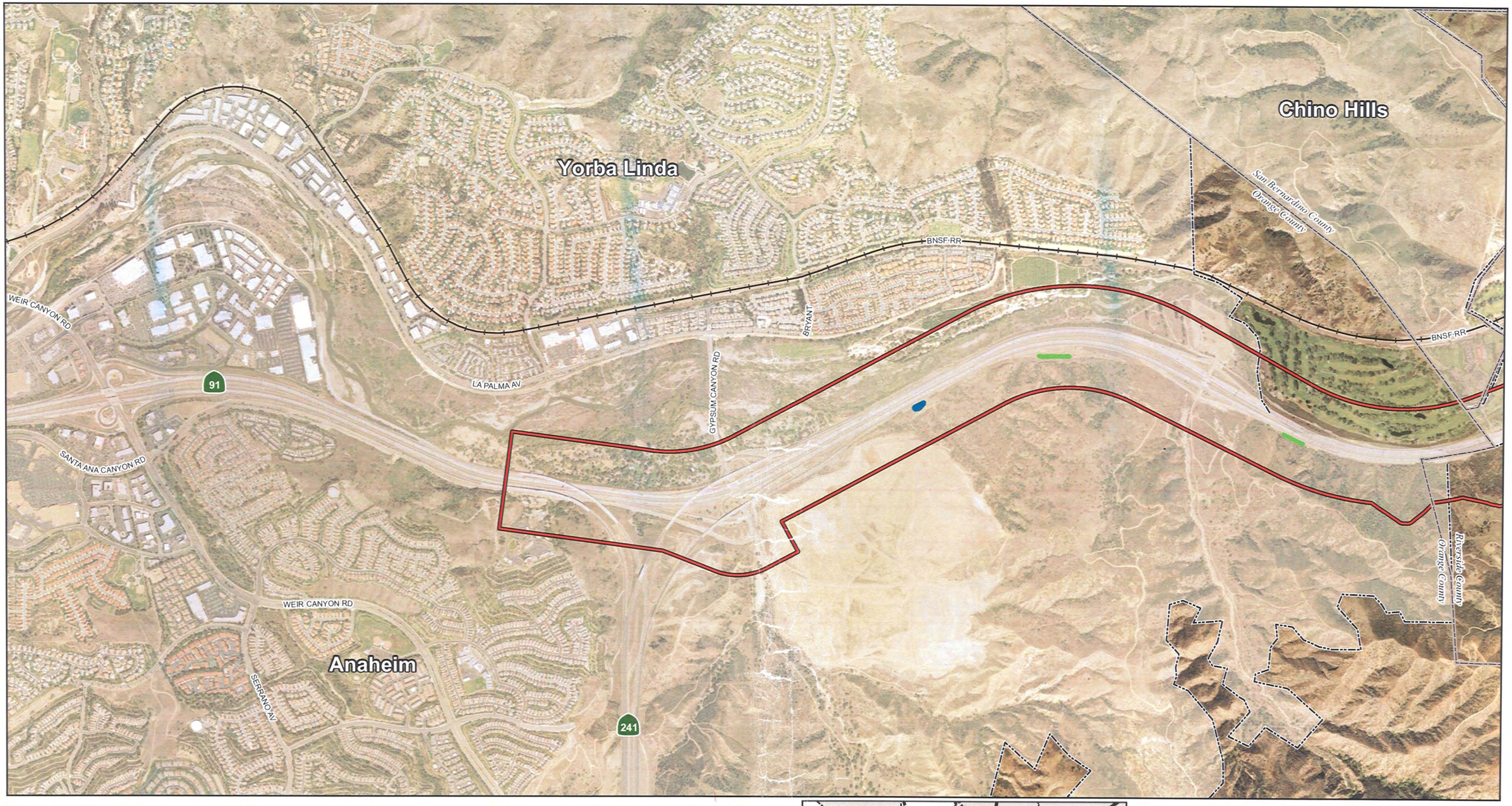

LEGEND

- SR-91 Study Area
- City Boundary
- County Boundary
- Bioswale
- Infiltration Basin/Detention Basin/Media Filter
- Well

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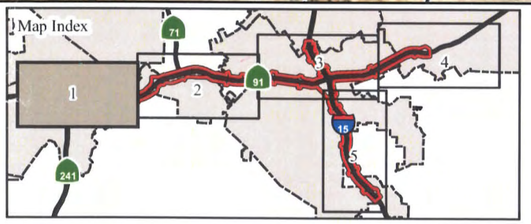

SOURCE: Digital Globe (04/2007); PB (2009); RBF (2009)

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FIGURE 3.10-3
Sheet 1 of 5

SR-91 Corridor Improvement Project

Proposed BMP Locations Alternatives 1 and 2 (LPA)

12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
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Chino Hills

San Bernardino County
Riverside County

71

CORONA EXWY

BNSF RR

PALISADES DR

GREEN RIVER RD

Corona

RAILROAD ST

MAPLE ST

AUTO CENTER DR

SMITH AV

91

6TH ST

SERFAS CLUB DR

Corona

BORDER AV

PACIFICA

GRANDE

LEGEND

- SR-91 Study Area
- City Boundary
- County Boundary
- Bioswale
- Infiltration Basin/Detention Basin/Media Filter
- Well

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SOURCE: Digital Globe (04/2007); PB (2009); RBF (2009)

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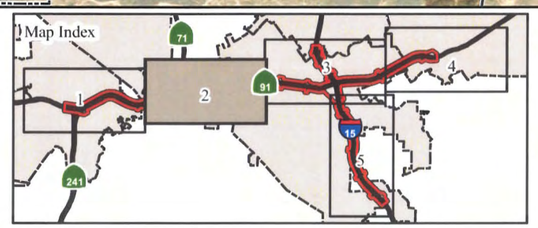

FIGURE 3.10-3
Sheet 2 of 5

SR-91 Corridor Improvement Project

Proposed BMP Locations Alternatives 1 and 2 (LPA)

12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
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Norco
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FIRST ST
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HIDDEN VALLEY PKWY
RINCON ST
SMITH AV
MAIN ST
RIVER RD
BNSF RR
RAILROAD ST
MCKINLEY ST
PROMENADE AV
15
CRESTA RD
PARKRIDGE AV
JOY ST
91
MERRILL ST
BUENA VISTA AV
2ND ST
6TH ST
LINCOLN AV
GRAND BLVD
MAIN ST
SMITH AV
BORDER AV
10TH ST
RIMPAU AV
MAGNOLIA AV
GRAND ST
INDIANA AV

LEGEND

- SR-91 Study Area
- City Boundary
- County Boundary
- Bioswale
- Infiltration Basin/Detention Basin/Media Filter
- Well

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SOURCE: Digital Globe (04/2007); PB (2009); RBF (2009)

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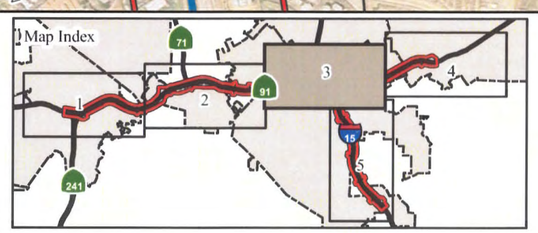

FIGURE 3.10-3
Sheet 3 of 5

SR-91 Corridor Improvement Project

Proposed BMP Locations Alternatives 1 and 2 (LPA)

12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
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LEGEND

- SR-91 Study Area
- City Boundary
- County Boundary
- Bioswale
- Infiltration Basin/Detention Basin/Media Filter
- Well

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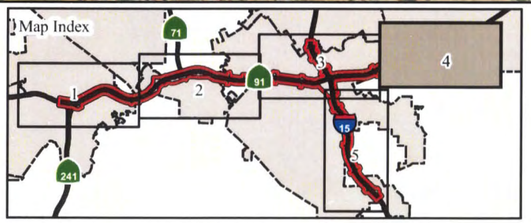

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FIGURE 3.10-3
Sheet 4 of 5

SR-91 Corridor Improvement Project

Proposed BMP Locations Alternatives 1 and 2 (LPA)

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08-Riv-91-R0.00/R13.04
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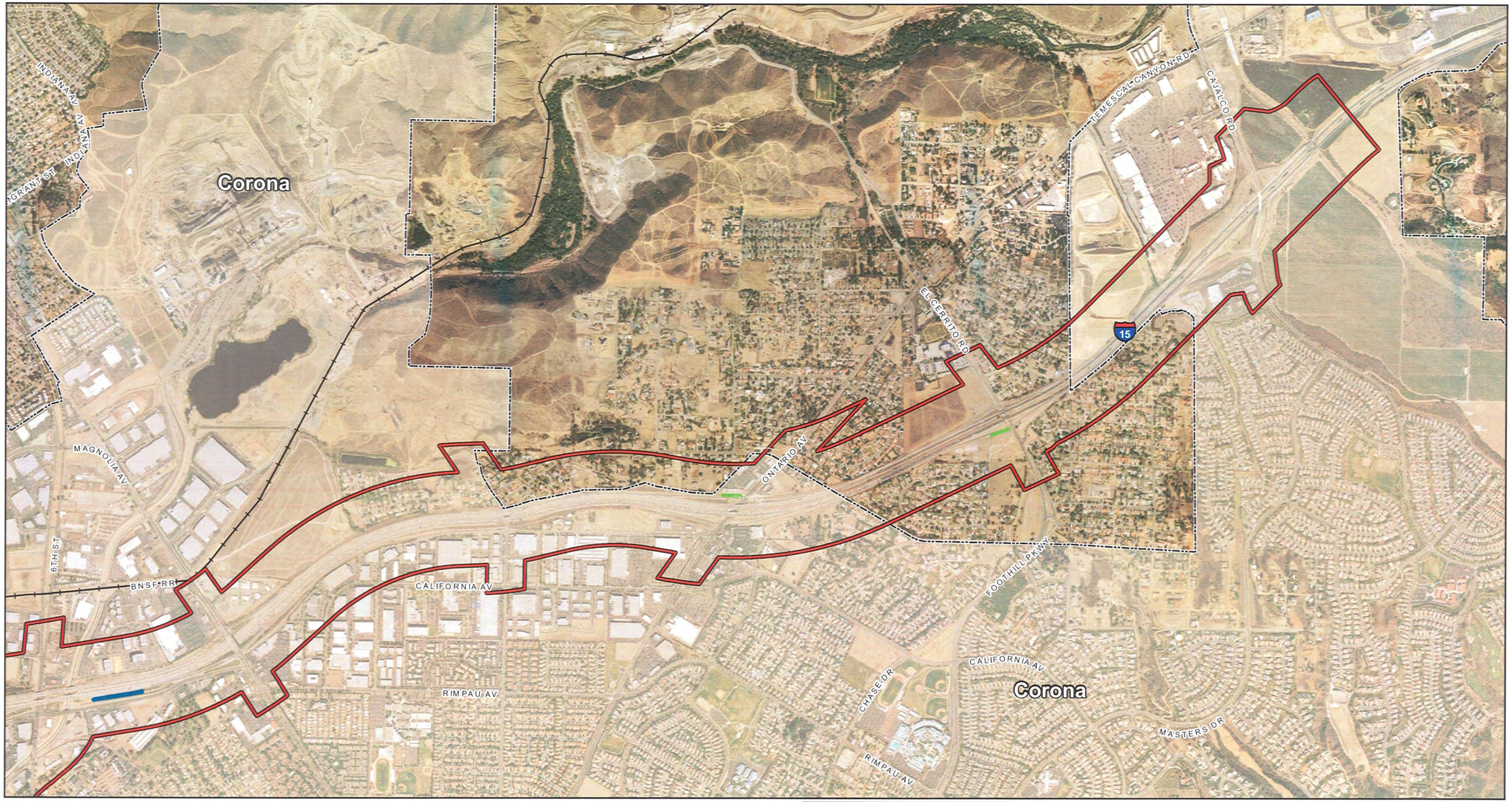

LEGEND

- SR-91 Study Area
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- County Boundary
- Bioswale
- Infiltration Basin/Detention Basin/Media Filter
- Well

0 750 1500
FEET

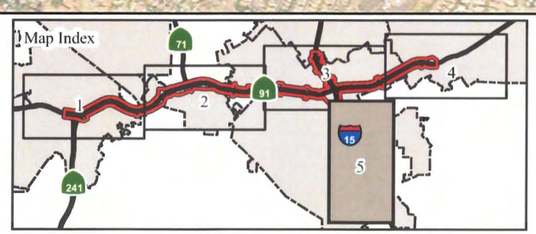

FIGURE 3.10-3
Sheet 5 of 5

SR-91 Corridor Improvement Project

Proposed BMP Locations Alternatives 1 and 2 (LPA)

12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
EA 0F540

SOURCE: Digital Globe (04/2007); PB (2009); RBF (2009)

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Yorba Linda
Chino Hills
Anaheim
BNSF RR
BNSF RR
WEIR CANYON RD
LA PALMA AV
BRYANT
SANTA ANA CANYON RD
SANTA ANA CANYON RD
WEIR CANYON RD
GYPSUM CANYON RD
SERRANO AV
San Bernardino County
Orange County
Riverside County
Orange County
91
241

LEGEND

- SR-91 Study Area
- City Boundary
- County Boundary
- Bioswale
- Infiltration Basin/Detention Basin/Media Filter
- Well

N

0 750 1500
FEET

SOURCE: Digital Globe (04/2007); PB (2009); RBF (2009)

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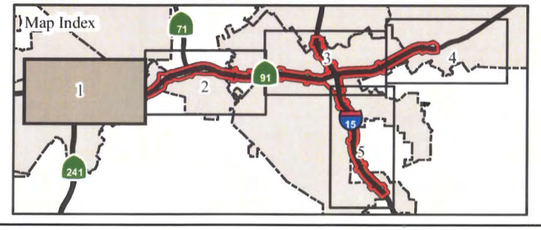

FIGURE 3.10-4
Sheet 1 of 5
SR-91 Corridor Improvement Project
Proposed BMP Locations for
the Initial Phase of Alternative 2 (LPA)
12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
EA 0F540

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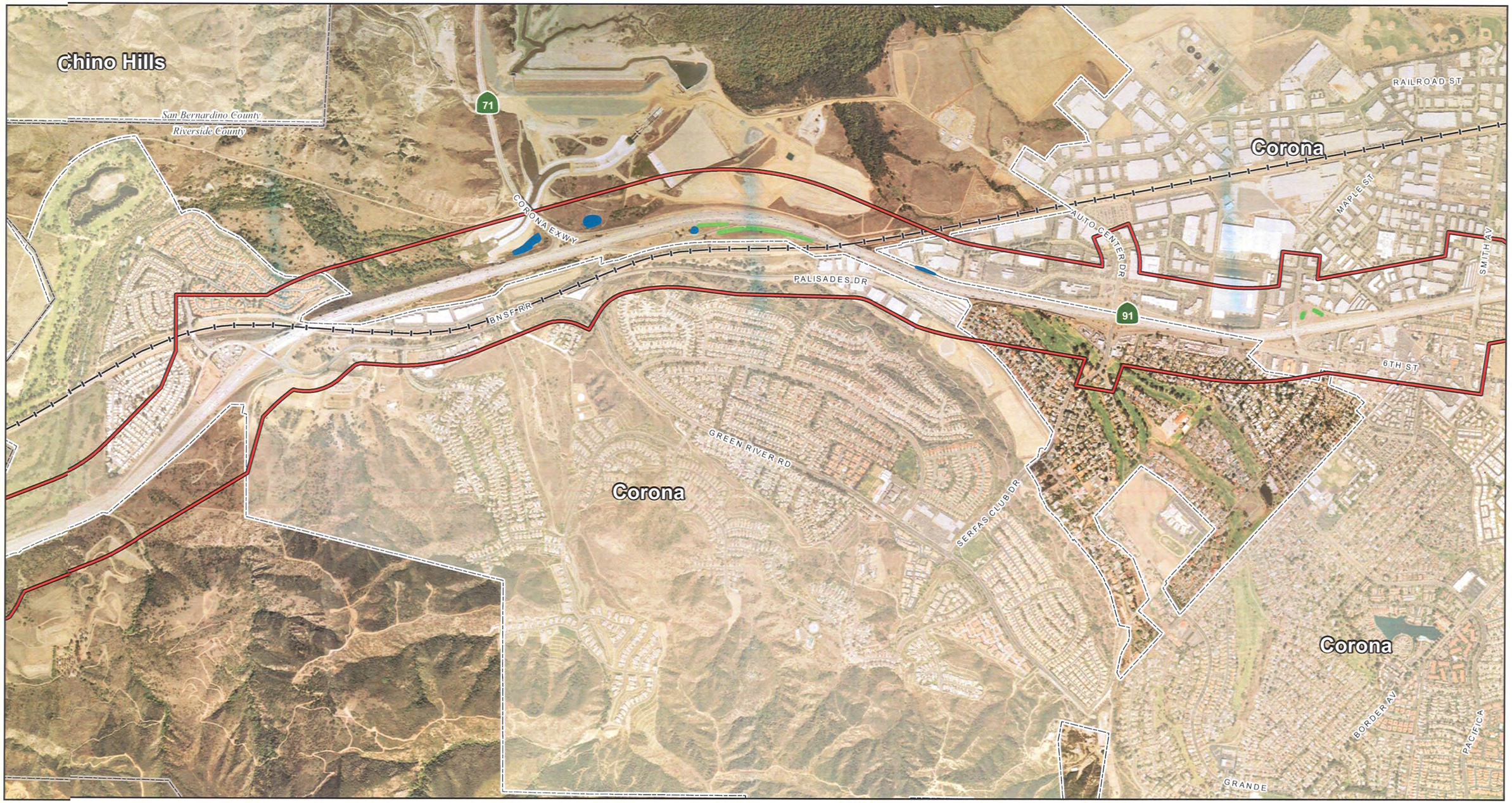

LEGEND

- SR-91 Study Area
- City Boundary
- County Boundary
- Bioswale
- Infiltration Basin/Detention Basin/Media Filter
- Well

0 750 1500
FEET

SOURCE: Digital Globe (04/2007); PB (2009); RBF (2009)

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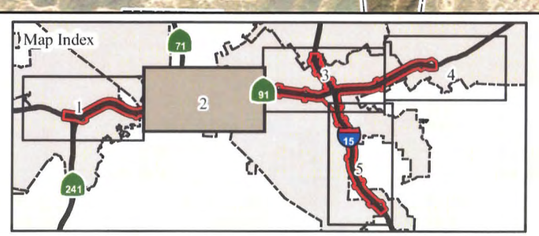

FIGURE 3.10-4
Sheet 2 of 5
SR-91 Corridor Improvement Project
Proposed BMP Locations for the Initial Phase of Alternative 2 (LPA)
12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
EA 0F540

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Norco
Corona
Corona
Corona
FIRST ST
LINCOLN AV
PARKRIDGE AV
HAMNER AV
HIDDEN VALLEY PKWY
RINCON ST
SMITH AV
MAIN ST
RIVER RD
BNSF RR
RAILROAD ST
MCKINLEY ST
PROMENADE AV
15
CRESTA RD
PARKRIDGE AV
JOY ST
91
MERRILL ST
BUENA VISTA AV
2ND ST
6TH ST
LINCOLN AV
GRAND BLVD
MAIN ST
MAGNOLIA AV
GRAND ST
INDIANA AV
SMITH AV
BORDER AV
10TH ST
JIMPAU AV

LEGEND

- SR-91 Study Area
- City Boundary
- County Boundary
- Bioswale
- Infiltration Basin/Detention Basin/Media Filter
- Well

N

0 750 1500
FEET

SOURCE: Digital Globe (04/2007); PB (2009); RBF (2009)

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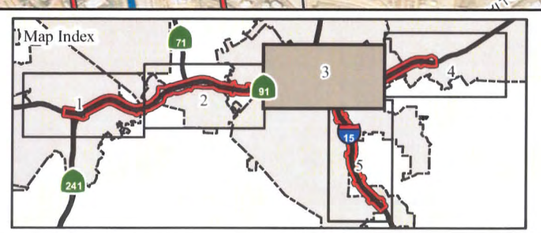

FIGURE 3.10-4
Sheet 3 of 5
SR-91 Corridor Improvement Project
Proposed BMP Locations for
the Initial Phase of Alternative 2 (LPA)
12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
EA 0F540

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Riverside
Corona
Riverside
RIVERWALK PKWY
COLLETT AV
PIERCE ST
POLK ST
MAGNOLIA AV
VAN BUREN BLVD
DIANA AV
INDIANA AV
BNSF RR
91
VICTORIA AV
TYLER ST
PROMENADE AV
BUCHANAN ST
LA SIERRA AV
INDIANA AV
DUFFERIN AV
AT&SF RR
MAGNOLIA AV
MCALLISTER ST
MCALLISTER PKWY
MCKINLEY ST
INDIANA AV

LEGEND

- SR-91 Study Area
- City Boundary
- County Boundary
- Bioswale
- Infiltration Basin/Detention Basin/Media Filter
- Well

N

0 750 1500
FEET

SOURCE: Digital Globe (04/2007); PB (2009); RBF (2009)

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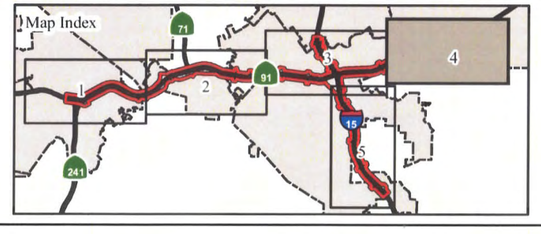

FIGURE 3.10-4
Sheet 4 of 5
SR-91 Corridor Improvement Project
Proposed BMP Locations for
the Initial Phase of Alternative 2 (LPA)
12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
EA 0F540

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Corona

INDIANA AV

GRANT ST

MAGNOLIA AV

6TH ST

BNSF RR

CALIFORNIA AV

RIMPAU AV

ONTARIO AV

EL CERRITO RD

TEMESCAL CANYON RD

CAJALCO RD

15

FOOTHILL PKWY

CHASE DR

MASTERS DR

Corona

LEGEND

- SR-91 Study Area
- City Boundary
- County Boundary
- Bioswale
- Infiltration Basin/Detention Basin/Media Filter
- Well

0 750 1500
FEET

SOURCE: Digital Globe (04/2007); PB (2009); RBF (2009)

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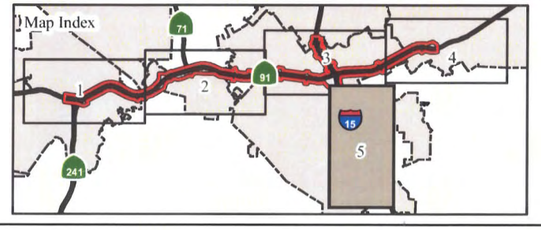

FIGURE 3.10-4
Sheet 5 of 5
SR-91 Corridor Improvement Project
Proposed BMP Locations for
the Initial Phase of Alternative 2 (LPA)

12-Ora-91-R14.43/R18.91
08-Riv-91-R0.00/R13.04
08-Riv-15-35.64/45.14
EA 0F540

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