# FOOTHILL TRANSPORTATION CORRIDOR SOUTH

## FOCUSED SUMMARY OF ENVIRONMENTAL IMPACTS IN THE COASTAL ZONE

LSA Project No. TCA 531

LSA

March 2007

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# 1.0 INTRODUCTION

## PROPOSED PROJECT

The Proposed Project involves the extension of State Route 241 (SR-241) from Oso Parkway to Interstate (I) 5. The project also includes ancillary improvements to I-5 where the Corridor connects with I-5 The SR-241 Extension will complete Orange County's 67-mile (mi) toll road system by extending SR-241 from its existing terminus at Oso Parkway to I-5 (Figure 1.1).

The proposed Corridor alignment traverses Marine Corps Base (MCB) Camp Pendleton and intersects the Coastal Zone Boundary at approximately 0.4 kilometer (km) (0.25 mi) northeast of and generally parallel to I-5. Figure 1.2 illustrates the vicinity of the SR-241 Extension and relationship to the Coastal Zone Boundary.

The South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) refers to the National Environmental Policy Act (NEPA)/Section 404 Memorandum of Understanding (MOU) project development process that was put in place under the authority of the NEPA/404 MOU, which provides for federal resource agency coordination in identifying the project Statement of Purpose and Need, selecting the Alternatives for evaluation, and selecting the Preferred Alternative. The federal agencies participating in this integrated process are the Federal Highway Administration (FHWA), Environmental Protection Agency (EPA), United States Fish and Wildlife Service (USFWS), and United States Army Corps of Engineers (Corps). The NEPA/404 MOU agencies, MCB Camp Pendleton, California Department of Transportation (Caltrans) and the Transportation Corridor Agencies (TCA) are collectively referred to as the "SOCTIIP Collaborative." The SOCTIIP project development process evaluated a variety of transportation alternatives, including toll road alternatives and non-toll road alternatives. A joint California Environmental Quality Act (CEQA)/ NEPA document was prepared, and the Draft Subsequent Environmental Impact Report (SEIR)/ Environmental Impact Statement (EIS) was released in Spring 2004. The SEIR was prepared to address the changes to the project since the earlier certification of Final EIR No. 3 (Final EIR, Foothill Transportation Corridor Oso Parkway to Interstate 5) in Fall 1991. Mitigation measures originally identified in the Mitigation Monitoring Program (MMP) in TCA Final EIR No. 3 have been incorporated, as appropriate, in the mitigation measures identified here for the Preferred Alternative.

In February 2006, the TCA certified the Final Subsequent Environmental Impact Report (SEIR) and adopted the SOCTIIP Preferred Alternative with preliminary concurrences from FHWA, ACOE, EPA, and USFWS. The Preferred Alternative is identified as the Alignment 7 Corridor-Far East Crossover-Modified (A7C-FEC-M) Alternative in the Final SEIR. The Preferred Alternative represents an alignment that completes the existing State Route 241 from its current terminus at Oso Parkway in southern Orange County to join I-5 in northern San Diego County. The completion of SR-241 is also referred to as Foothill Transportation Corridor-South (FTC-S) and Foothill-South. In this document the terms Preferred Alternative, proposed project, and FTC-S are used interchangeably.

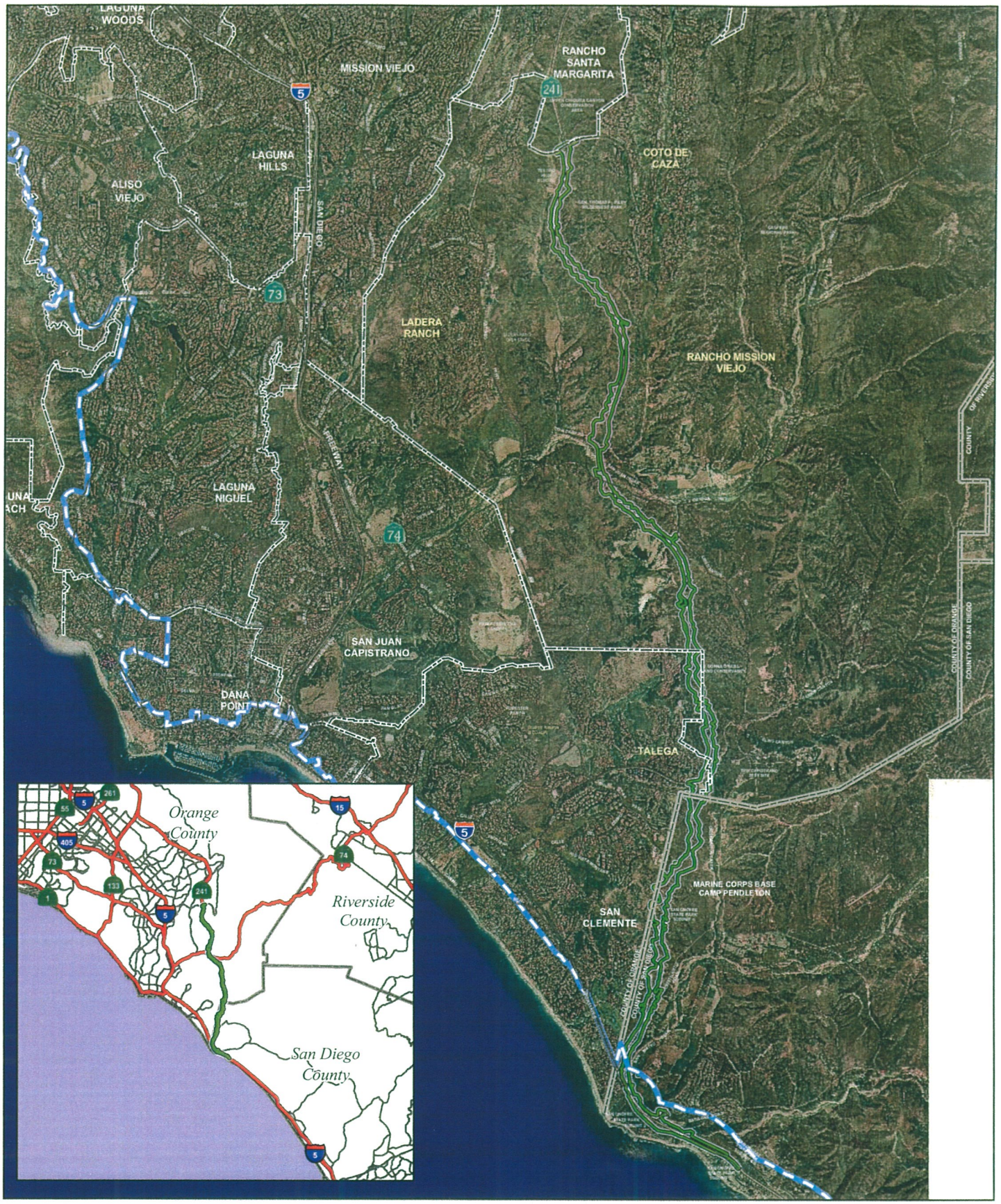


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FIGURE 1.1

Coastal Zone Boundary

Preferred Alternative (11/26/06)

0 1 2 MILES

*Foothill Transportation Corridor – South*

Regional Location

SOURCE: EagleAerial (4/06); TCA (11/29/06); CCC (2005)

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FIGURE 1.2

Coastal Zone Boundary

Preferred Alternative (11/26/06)

0 750 1,500 FEET

*Foothill Transportation Corridor – South*

Coastal Zone Boundary

SOURCE: EagleAerial (4/06); TCA (11/29/06); CCC (2005)

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## PURPOSE OF THIS SUMMARY DOCUMENT

The Final SEIR, including Appendices and Technical Reports, provides detailed information regarding all of the alternatives evaluated in the Draft EIS/SEIR. The Final SEIR evaluated eight "build" alternatives and two No Action Alternatives. The Technical Reports evaluated up to 24 alternatives (19 of which were evaluated in both initial and ultimate configurations). The purpose of this summary document is to provide a focused summary of the SEIR conclusions for the Preferred Alternative, the proposed project, and particularly for potential impacts of the proposed project in the Coastal Zone.

## PROJECT OVERVIEW

The Proposed Project, the SR-241 Extension of FTC-S, is approximately 16 mi long plus approximately 1.3 km (0.8 mi) of improvements on I-5. The proposed facility includes four general-purpose travel lanes, two in each direction, for the entire length of the Corridor. Two additional lanes will be added in the future as traffic conditions warrant. Key components of the Proposed Project include continuous mainline travel lanes and ramps south of Oso Parkway, several wildlife structures/bridges to facilitate wildlife movement, an approximately 640 meter (m) (2,100 foot [ft]) bridge structure crossing San Juan Creek, a toll plaza north of Ortega Highway, ramp toll plazas at Cow Camp Road and Avenida Pico, an approximately 870 m (2,850 ft) elevated bridge structure spanning San Mateo Creek and I-5 (providing a direct connection to I-5), and reconstruction of the existing I-5/Basilone Road interchange. FTC-S is designed to accommodate enhanced access for MCB Camp Pendleton in support of its military training mission.

## DESCRIPTION OF THE PROPOSED PROJECT IN THE COASTAL ZONE

The portion of the SR-241 Extension that is located in the Coastal Zone consists of the proposed SR-241/I-5 connectors. The total length of the project in the Coastal Zone is approximately 2.5 miles. The northbound and southbound SR-241/I-5 connectors will consist of two general-purpose lanes in each direction on two bridge structures over San Mateo Creek. The Coastal Zone portion of the project also includes reconstruction of the Basilone Road Overcrossing over I-5 and widening of the I-5/San Onofre Creek Bridge structure (Figure 1.3).

The project elements within the Coastal Zone include the following:

### Highway Improvements

- I-5 connectors to and from FTC-S (one southbound SR-241 to southbound I-5 connector and one northbound I-5 to northbound SR-241 connector), which bridge over San Mateo Creek
- The realignment and reconstruction of the existing I-5/Basilone Road interchange and ramps with no direct connection of SR-241 to Basilone Road
- A minor widening of I-5 south of Basilone Road to accommodate the project connector roads
- A sound wall south of Basilone Road
- The widening of the I-5 bridges over San Onofre Creek

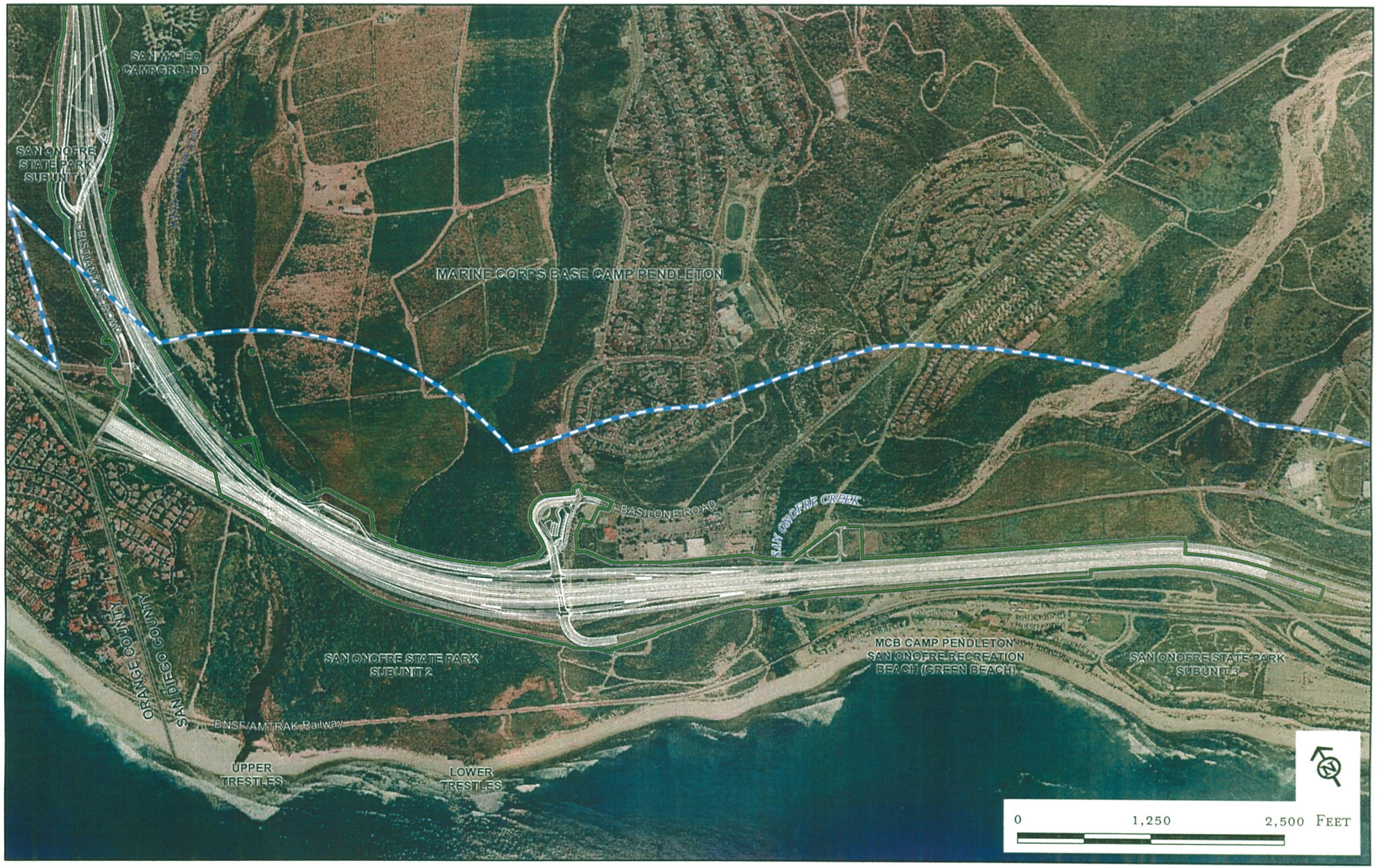


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FIGURE 1.3

County Boundary

Coastal Zone Boundary

Preferred Alternative (11/26/06) Disturbance Limits

Proposed Geometrics*

*Foothill Transportation Corridor – South*

Proposed Project

SOURCE: EagleAerial (4/2006); TCA (11/29/06, 3/07); CCC (2005) *Geometrics are provided for illustrations purposes only and should not be used otherwise

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- A sound wall on the south side of I-5
- A sound wall east of the San Mateo Point housing area on MCB Camp Pendleton west of I-5
- Construction of a new public sidewalk along Cristianitos Road
- Reconstruction of a public sidewalk at the Basilone Overcrossing

### Water Quality Improvements

- Water quality improvements to approximately 2 miles of I-5 that currently has no water quality treatment infrastructure, which will capture for treatment an estimated 5 gallons of storm water each year that currently flow to San Onofre and San Mateo Creeks untreated
- Two on-site extended detention basins (EDBs), one adjacent and tributary to San Mateo Creek (41-acre area = System 1) and the other adjacent and tributary to San Onofre Creek (64-acre area = System 2)
- A bioswale, vegetated with native grasses, for treatment of freeway storm water from SR-241

### Military and National Security Improvements

- The reconstruction and replacement of the San Onofre Gate to provide entry to MCB Camp Pendleton, which will include new enhanced security facilities per the Anti-Terrorist Force Protection Program (ATFPP)
- A widened military access road under the southerly end span of the existing San Mateo Creek/I-5 Bridge, allowing improved Marine access between Green Beach and northern military training areas

In order to accommodate the FTC-S connectors passing underneath the Basilone Overcrossing, the Basilone Road Overcrossing at I-5 will be realigned and reconstructed along with the four Basilone Road ramps to and from I-5 as well as a portion of Basilone Road.

Minor cut-and-fill grading and retaining walls will be utilized south of the San Mateo Bridge abutments where the southbound and northbound connector ramps parallel I-5 and pass under Basilone Road to San Onofre Creek.

At San Onofre Creek, the southbound and northbound connectors begin to merge and diverge, respectively, from I-5. The existing I-5 bridges over San Onofre Creek will be widened to accommodate the connectors. Both the merging southbound connector and the diverging northbound connector extend approximately 4,000 ft south of San Onofre Creek.

Construction of the SR-241/I-5 connectors will also include the relocation of existing conflicting utility facilities. All utility relocations will be accomplished within the disturbance limits evaluated in the Final SEIR. Overhead sign structure(s) for northbound I-5 approaching the SR-241 will also be constructed south of the San Onofre Creek Bridge. The proposed project in the Coastal Zone also includes national security-related improvements on MCB Camp Pendleton and water quality features along I-5. These are:

### Military and National Security Improvements

- The complete reconstruction and replacement of the Basilone Gate to provide entry to MCB Camp Pendleton, which will include new enhanced security facilities per the Anti-Terrorist Force Protection Program
- A widened military access road under the southerly end span of the existing San Mateo Creek/I-5 Bridge, allowing improved Marine access between Green Beach and northern military training areas

### Water Quality Improvements

- Water quality improvements to approximately 2 miles of I-5 that currently has no water quality treatment infrastructure, which will capture for treatment an estimated 5 gallons of storm water each year that currently flow to San Onofre and San Mateo Creeks untreated
- Two on-site extended detention basins (EDBs), one adjacent/tributary to San Mateo Creek (41-acre area = System 1) and the other adjacent/tributary to San Onofre Creek (64-acre area = System 2)
- A bioswale, vegetated with native grasses, for treatment of freeway storm water

# 2.1 LAND USE

## 2.1.1 INTRODUCTION

The analysis of the potential land use impacts of the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) Alternatives is based on review of field surveys, review of the latest aerial photographs of the study area, review of the most current applicable land use planning and land use maps for jurisdictions in the SOCTIIP study area, and meetings with affected agencies. The study area comprises the areas potentially directly affected by construction and the areas adjacent to the construction area for all the SOCTIIP Alternatives. Additionally, the United States Fish and Wildlife Service (USFWS) and the United States Army Corps of Engineers (Corps) were consulted about any mitigation projects within the study area for identification and impact assessment purposes. Finally, general guidance and direction was taken from comments received on the Notice of Preparation/Notice of Intent (NOP/NOI), although very few comments on land use analysis methodology were received.

The assessment of land use impacts was based on mapping prepared for the SOCTIIP study using a compilation of General Plan Land Use Elements (LUEs), local zoning information, and master development plans for all the jurisdictions in the study area. The areas of disturbance for all the SOCTIIP Alternatives by segments as defined in Section 2.0 (Alternatives) were then overlaid through Geographic Information Systems (GIS) and computer assisted drafting and design (CADD) mapping onto the compiled land use maps, and aerial photographs and areas of direct impact were assessed. In some cases the segments were refined to correspond with jurisdictional boundaries. The total areas of temporary disturbance and permanent right-of-way for each alternative by jurisdiction and by land uses affected were compiled into a summary table for each Alternative. In addition, a general consistency analysis based on General Plans was conducted.

The potential impacts of the SOCTIIP Alternatives related to land use are evaluated in detail in the Land Use Technical Report (P&D Consultants, 2003) and are summarized in Section 4.2 of the Final Subsequent Environmental Impact Report (SEIR).

## 2.1.2 SETTING

### Study Area Setting

The land use and General Plan analysis for the Draft EIS/SEIR addressed the existing land use conditions and adopted pans for the project study area, which included numerous municipal jurisdictions because of the range of alternatives being considered.

The Preferred Alternative is located in unincorporated Orange and San Diego Counties and transects land owned by two major property owners: the Rancho Mission Viejo (RMV) Company in Orange County, and the Department of the Navy (DON), Marine Corps Base (MCB) Camp Pendleton in San Diego County.

The Preferred Alternative in unincorporated Orange County transects an area that is generally undeveloped, consisting largely of RMV property that is planned for development and open space as part of the Ranch Plan. The proposed alignment also transects a portion of the Donna O'Neill Land Conservancy. The Donna O'Neill Land Conservancy is a 486 hectares (ha) (1,200 acres [ac]) open space reserve in the Rolling Hills Planned Community Specific Plan area. The Donna O'Neill Land Conservancy was created in 1991 to complement Orange County's goal to preserve and enhance lands throughout the region for educational, ecological, scenic, and open space uses. The Donna O'Neill Land Conservancy is owned by RMV.

At the time the Draft EIS/SEIR was being prepared, the majority of the 9,254 ha (22,850 ac) RMV property was being used for ranch operations, including cattle grazing, barley farming, and citrus orchards. There are a number of ranch access roads in the SOCTIIP study area that were and are being used for daily operations. Two cattle corrals on the ranch, the Cristianitos Corrals and Cow Camp, are used year-round. Additional uses on RMV include the Last Roundup (the O'Neill family cemetery) and Amantes Camp (day camp/amenity area) in an area south of Ortega Highway.

### Rancho Mission Viejo

In 2001, conceptual land use plans for RMV were submitted to the County proposing 14,000 dwelling units (du) in a community of mixed-use villages. The village concept combines high-density residential, low-density residential, and commercial and office uses into integrated areas.

The County of Orange approved the RMV Planned Community (The Ranch Plan) in November 2004, after the publication of the Draft EIS/EIR. The Ranch Plan depicted an alignment of the FTC South as shown on the Master Plan of Arterial Highways (MPAH); however, the EIR for the Ranch Plan acknowledged that if another alignment is selected, the development plan will accommodate the selected alignment. The Ranch Plan was approved at a General Plan or conceptual level plan, with development areas shown as "bubbles" with no grading plan or placement of residential units or buildings. Development on the Ranch will not occur without additional, more detailed planning through an Area Plan process with the County of Orange. The future Area Plan can keep site development away from the Preferred Alternative while staying within the development bubbles.

Subsequent to County approval of the Ranch Plan, the County of Orange and RMV entered into a Settlement Agreement with the Endangered Habitats League, Natural Resources Defense Council, Sea and Sage Audubon Society, Laguna Greenbelt, Inc., and Sierra Club. The Settlement Agreement did not change the total number of approved du for the Ranch Plan, but did alter the location of development and increased the area devoted to open space.

### MCB Camp Pendleton

The northernmost part of MCB Camp Pendleton is in the project study area. Most of the MCB Camp Pendleton lies in San Diego County. A small area on the northeast corner of the Base, outside the Coastal Zone, lies in Orange County.

San Onofre State Beach (SOSB) is a State park in the northern part of San Diego County, as shown in Figure 2.20-1 in the Recreation Section of this document. The park lease is on MCB Camp Pendleton

land. The lower part of the SOSB is beach lands and bluffs extending inland on the San Diego/Orange County border. SOSB is operated and managed by the California Department of Parks and Recreation.

The SOSB was established as a State recreational area in 1971 by a 50-year lease between the State and the federal government. The lease acknowledges that the federal government reserves the right to grant easements and right-of-way across the leased area for facilities determined to be in the public interest.

As cited from the 1984 SOSB General Plan Resources Policy Formation (page 19), the Declaration of Purpose for SOSB is as follows, although acreages have been amended since 1984:

> "San Onofre State Beach was established to make available to the people the outstanding natural beach, bluffs, and related geological, ecological, and cultural features along the northern coast of San Diego County, including important uplands east of the Interstate 5 Freeway in the Valley of San Mateo Creek; and to provide for the enjoyment and use of these areas in ways that take full advantage of the recreational opportunities thus afforded, while protecting the natural and cultural values of the region.
>
> Located amidst dense urban development along the coast, the unit's relatively large size (more than 6.4 km (4 mi)) of ocean beach and 1,266 ha (3,127) ac has regional and statewide significance. Archaeological sites and threatened plant communities such as purple needlegrass tall prairie, red willow short woodland, arroyo willow tall closed scrub, and laurel sumac-sugar bush medium closed scrub are also prime resources of statewide significance."

SOSB features 5.6 kilometers (km) (3.5 miles [mi]) of sandy beaches with six access trails into the bluff above. The campgrounds are along Old Highway 101 adjacent to the sandstone bluffs and inland north of Interstate 5 (I-5). SOSB includes a marshy area where San Mateo Creek meets the shoreline as well as Trestles Beach, a well known surfing site.

### Existing Land Uses at San Onofre State Beach/MCB Camp Pendleton

As shown in 2.1-1, SOSB is composed of four geographical subunits: Subunit 1, Subunit 2, Subunit 3, and Subunit 4.

Subunits 1 and 2, the northernmost subunits, follow Cristianitos and San Mateo Creeks. Trestles subunit lies west of I-5 and includes the mouth of San Mateo Creek and the adjoining wetlands. Subunit 1 lies east of I-5 and includes parts of San Mateo and Cristianitos Creeks. The most prominent uses in this subunit are trails and the San Mateo Campground, which is approximately 2.8 km (1.5 mi) inland. This campground is open year-round and has 157 camp sites.

Subunit 3, beginning just below the site of the former community of San Onofre, extends downcoast for a distance of approximately 2 km (1.2 mi). The San Onofre Nuclear Generating Station (SONGS) and other related facilities are further downcoast extending 1.4 km (0.9 mi). The Bluffs subunit begins at the south end of SONGS and extends approximately 5.5 km (3.4 mi) downcoast. Partly because of the uniformity of the marine terrace in this area and partly because of the routes selected for I-5 and the railroad, the width of Subunits 3 and 4 is uniformly 183 to 244 meters (m) (600 to 800

feet [ft]) throughout the entire length. Subunit 3 includes the San Onofre Bluffs Campground, which is open seasonally (not year-round).

There is an active Burlington Northern Santa Fe (BNSF) railroad right-of-way approximately parallel to I-5 and the beaches in SOSB on the coastal side of I-5. The railroad right-of-way runs through Subunits 1 and 3.

Existing land uses at SOSB, as described in the SOSB General Plan (1984 Revised), are:

**Subunit 1:** Most of this 535 ha (1,321 ac) subunit is open space. The most prominent uses in the inland area are the San Mateo Campgrounds and the hiking trails extending inland and beachward from the campgrounds.

**Subunit 2:** This 85 ha (209 ac) subunit has 1.82 km (6,000 feet) of shoreline used for surfing. This area also has wetland preserves and trails facilitating beach access.

**Subunit 3:** This subunit is 34 ha (84 ac) with a 1.3 km (3,400 ft) long beach zoned for surfing use. The bluff top is used for parking for the SONGS.

**Subunit 4:** This 164 ha (405 ac) subunit has 5.6 km (3.5 mi) of beach used for swimming, sunbathing, and other beach recreation uses. There are also day-use parking areas and overnight camping areas. The bluff tops and canyons between I-5 and the beach are open space.

Because the SOSB is leased through 2021 from the federal government, it is not subject to land use regulation by the County or the State. However, the California Coastal Commission (CCC) reviews any development plans for consistency with the California Coastal Act and its reciprocal process under the Federal Coast Zone Management Act.

### Planned Land Uses at San Onofre State Beach/MCB Camp Pendleton

According to the SOSB General Plan (1984), Subunit 1 is proposed to have an 18-hole golf course for the area directly west of the existing San Mateo Campground. Primitive camps along hiking trails utilizing the north part of this Subunit extending inland are also proposed with a possible secondary access from the Avenida Pico extension. No implementation plans for these proposed facilities are being pursued at this time.

### Green Beach/MCB Camp Pendleton

Green Beach is located on MCB Camp Pendleton between SOSB Subunit 2 and SOSB Subunit 3. Green Beach is devoted to amphibious military training and MCB Camp Pendleton recreation. It is not part of the SOSB lease area.

### Regional Land Use and Transportation Plans

**County of Orange Congestion Management Program.** The gas tax increase (Proposition 111 or Measure M), adopted in the November 6, 1990, County General Election, included a requirement that

urbanized areas in the State adopt a Congestion Management Program (CMP). The goals of the CMP are to reduce traffic congestion and provide a mechanism for coordinating land use development and transportation improvement decisions. For a jurisdiction to be eligible for Proposition 111 funds, no intersection on an adopted CMP highway system may be allowed to deteriorate to a level of service (LOS) worse than E, or the existing (1991) LOS if worse than LOS E, without mitigation being prescribed in an adopted deficiency plan.

The Orange County CMP, adopted in 1991 and administered by the Orange County Transportation Authority (OCTA), established the freeway system and major arterial highways as the Orange County CMP Highway System. The Orange County CMP established a process for each jurisdiction to analyze the impacts of proposed development on the CMP Highway System. Each jurisdiction is required to analyze development projects to determine whether project-generated traffic will cause CMP intersections/links to exceed their LOS standards and to assess feasible mitigation measures to maintain the adopted LOS standard. In addition, the Orange County CMP includes mechanisms for interjurisdictional coordination where a proposed development is determined to generate an increase in traffic on CMP links/intersections beyond an individual jurisdiction's boundaries.

**SCAG Regional Comprehensive Plan and Guide.** The Southern California Association of Governments (SCAG) Regional Comprehensive Plan and Guide (RCPG, SCAG, March 1996), formerly referred to as the SCAG Growth Management Plan, is a summary of various plans for the southern California region, some of which are required by federal or State law. The RCPG was developed in cooperation with numerous agencies, including counties and cities in Southern California, transportation commissions, the California Department of Transportation (Caltrans), the Metropolitan Water District of Southern California, the California Energy Commission, the Bureau of Land Management of the United States Department of the Interior, the South Coast Air Quality Management District, Ventura Air Pollution Control District, and other parties, both public and private.

The RCPG consists of three sections: Growth Management; Regional Mobility; and Air Quality, Water Quality, and Hazardous Waste Management. These are the chapters that currently respond directly to federal and State requirements placed on SCAG. Local governments are required to use these as a basis of their plans for purposes of consistency under regional plans under CEQA. These chapters also serve as advisory materials and guidance. Those requirements based on State and federal statutes found in these chapters also form the basis for certification of local plans described in the Implementation Chapter of the RCPG (RCPG, SCAG, March 1996).

Since the time that the Draft EIS/SEIR was prepared, SCAG adopted an updated Regional Transportation Plan (RTP) (2004) and Regional Transportation Improvement Plan (RTIP) (2004) that reflect Foothill Transportation Corridor-South (FTC-S).

**SANDAG Regional Transportation Improvement Program.** The San Diego Association of Governments (SANDAG) is the regional planning agency for San Diego County. SANDAG addresses regional growth, transportation, environmental management, housing, open space, air quality, energy, fiscal management, economic development, and criminal justice issues by

establishing policies, adopting plans, allocating transportation funds, and developing programs that are used by local governments and other public and private organizations.

The land use and General Plan analysis for the Draft EIS/SEIR addressed the existing land use conditions and adopted plans for the SOCTIIP study area, which included numerous municipal jurisdictions because of the range of alternatives being considered.

SANDAG adopted the San Diego Association of Governments Regional Transportation Improvement Program (RTIP) to facilitate accomplishing regional goals related to transportation. With the exception of the Interstate 5 corridor through MCB Camp Pendleton, the RTIP does not include the area on MCB Camp Pendleton, as SANDAG has no authority to enforce any policies there. The DON has jurisdiction over MCB Camp Pendleton in the part of San Diego County that is in the SOCTIIP study area.

**County of San Diego General Plan.** The County of San Diego General Plan serves as a guideline for coordinating land use considerations. However, this plan is not relevant to land use concerns in the SOCTIIP study area because the DON has jurisdiction over MCB Camp Pendleton, the part of San Diego County that is in the study area.

**San Diego North County Transit District Fast Forward.** The North County Transit District (NCTD) Fast Forward Plan includes transit system strategies for northern San Diego County. There are no land use policies that affect any of the SOCTIIP Alternatives in the NCTD Fast Forward Plan.

**County of San Diego Congestion Management Plan.** The CMP for San Diego County performs a similar function as the Orange County CMP; however, its funding and implementation are different. The CMP does not include MCB Camp Pendleton, and therefore, there are no San Diego County CMP roads in the SOCTIIP study area. Additionally, the land use monitoring component has no land use policies that could affect land use in the SOCTIIP study area.

## Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements being required by the Marine Corps. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.1.3 IMPACTS

### Project Impacts

The Preferred Alternative does not transect the boundaries of any incorporated municipalities; therefore, there are no impacts to City General Plans or existing land uses within incorporated areas.

The Preferred Alternative does transect the RMV property located in unincorporated County. The Preferred Alternative is consistent with the development concept for the Ranch Plan.

The County of Orange approved The Ranch Plan in November 2004 after the publication of the SOCTIIP Draft EIS/SEIR, as described above. The Ranch Plan was further refined as part of a Settlement Agreement, as also described above. The Ranch Plan depicted an alignment of the FTC-South (FTC-S) as shown on the MPAH; however, the EIR for the Ranch Plan acknowledged that if another alignment is selected, the development plan will accommodate the selected alignment. Subsequent to County approval of the Ranch Plan, the County of Orange and RMV entered into a Settlement Agreement that did not change the total number of approved dwelling units for the Ranch Plan, but did alter the location of development and increased the area devoted to open space.

The Ranch Plan is a General Plan or conceptual-level plan, with development areas shown as "bubbles" with no grading plan or placement of residential units or buildings. Development on the Ranch will not occur without additional, more detailed planning through an Area Plan process with the County of Orange. The future area plans can site development outside the Preferred Alternative, but within the development areas.

In addition, the availability of the approved Ranch Plan and Ranch Plan Settlement Agreement provides an opportunity for coordinated planning and plan refinements between the two projects. For example, now that the Foothill/Eastern TCA Board has adopted the Preferred Alternative, RMV is able to accommodate the alignment as specific development site plans, Area Plans, and subdivision maps are prepared for the Ranch Plan. Likewise, with the availability of the Ranch Plan EIR and subsequent Ranch Plan Settlement Agreement, the TCA has been able to make refinements to the Preferred Alternative to adjust the location of the alignment through the Ranch Planning Area 2 in order to allow for the consolidation of the development area and modify the Cow Camp Road interchange design from a full diamond to folded diamond design to be consistent with the Arterial Plan in the approved Ranch Plan.

The Preferred Alternative would not adversely impact existing land uses on RMV such as cattle grazing. There are no active agricultural areas and out-leases on RMV that would be affected by this alignment. The Preferred Alternative also traverses the access road to the Last Roundup and Amantes Camp, which is a special event area; however, these areas will not be directly impacted by this Alternative.

### San Diego County

**MCB Camp Pendleton/FTC-S.** There are no cities in San Diego County that would have land uses affected by the SOCTIIP Alternatives. The County of San Diego defers to Camp Pendleton related to land uses and planning on the Base. Therefore, no General Plans for the County or any city were used for the consistency evaluation in San Diego County. The Integrated Natural Resources Management

Plan (INRMP) for Camp Pendleton and the SOSB General Plan were reviewed. Both these planning documents acknowledge the FTC-South planning efforts.

The INRMP discusses the SOCTIIP Alternatives in Section 2.5.1 (Public Interstate Freeway, Railroad Right-of-Ways, and Future Transportation Corridors), as follows:

> "In 1988 the Marine Corps Commandant agreed that the TCA could evaluate an on-Base alignment of the proposed SOCTIIP toll road project, subject to the following stipulations: (1) that other off-Base alignment alternatives must also be considered and evaluated in an equal manner; (2) that any planned Camp Pendleton alignment must closely adhere to the Base's northern boundary; (3) that any adverse environmental impacts created as a result of siting this route on the Base must be fully and properly mitigated; and most importantly, (4) that any on-Base alignment must not impact the Marine Corps' mission nor interfere with the Base's operational flexibility. This Marine Corps position has remained steadfast throughout the years of TCA planning for this proposed toll road; and the Marine Corps continues to monitor and sometimes participate in TCA's further planning efforts for this proposed transportation improvement project. If constructed on Camp Pendleton, only one alignment alternative, meeting the above stipulations, is considered acceptable to the Marine Corps." (pp. 2-55, Final INRMP for Marine Corps Base and Marine Corps Air Station Camp Pendleton, October 2001).

The Preferred Alternative alignment on the Base in the SOSB lease area is consistent with this description. The Department of the Navy (DON) has stressed this position in official communications (refer to the Military Impacts Technical Report (P&D Consultants 2003). Although this alignment would still have an impact on the military training mission at Camp Pendleton, the DON had agreed that this alignment could be evaluated in the EIS/SEIR. It was assumed, and since confirmed, that alignments of the build Alternatives that generally follow this alignment would be acceptable to the DON because they are similar to the alignment referenced by MCB Camp Pendleton in that they closely adhere to the Base's northern boundary compared to the other alternatives that are aligned further south.

**MCB Camp Pendleton/Existing Land Uses.** The Preferred Alternative includes ramps at Basilone Road and, at the request of DON, improvements at Basilone Road at the San Onofre Gate consistent with Homeland Security requirements. The impacts of the gate area improvements are beneficial to MCB Camp Pendleton because implementation of the Preferred Alternative will result in improved Base security. The construction of the Preferred Alternative improvements to I-5 could indirectly impact Camp Pendleton's San Onofre Recreation Beach. See Section 2.20 for more information. The Preferred Alternative maintains and enhances the military's access to Green Beach; therefore, there are no adverse impacts to amphibious landings and training uses at Green Beach.

Military impacts, including impacts to training operations and existing and planned land uses, are discussed in detail in Section 4.21 of the Final SEIR. Impacts to the SOSB, which is on property leased from the federal government, are discussed in Section 4.25 of the Final SEIR.

**MCB Camp Pendleton/San Onofre State Beach.** Because SOSB is a lease on MCB Camp Pendleton, the ultimate land use control for this area lies with the DON. The California Department of

Parks and Recreation adopted a General Plan for SOSB in 1984. The General Plan acknowledges the FTC-S alignment through the Park and east of San Mateo Creek, which had already been on the County of Orange General Plan for several years. The Planning and Zoning discussion of the Environmental Impact Element of the SOSB General Plan states:

> "The FTC and La Pata Avenue are shown in the Master Plan of Arterial Highways component of the Orange County General Plan, adopted in 1983. The Foothill Transportation Corridor would have six or eight lanes, claiming a right-of-way of 300-400 feet wide. The final route for the FTC has not been selected, but the maps show it running along the east side of San Mateo Creek the full length of Subunit 1, intersecting with the San Diego Freeway at the location of Basilone Road interchange." (pp. 57, 1984 San Onofre State Beach Revised General Plan.)

In addition, the Department of Parks and Recreation was notified of a variety of conceptual alignments that passed through or near SOSB in a 1983 letter from Supervisor Thomas F. Riley responding to the public circulation of the Draft SOSB General Plan and EIR. That letter clarified the intention of the County to build a corridor in the area. This 1983 correspondence predates the TCA and occurred when Orange County was the lead agency/proponent for the transportation corridors, including the FTC-S.

The SOSB General Plan does not discuss consistency or compatibility of the FTC-S. However, because the SOSB General Plan anticipated plans for the FTC-S through the Cristianitos Subunit (Subunit 1), which would actually be on the west and not the east side of the Creek, and because the entire subunit lies west of San Mateo Creek, there is no inconsistency with the SOSB General Plan for the Preferred Alternative.

Potential impacts to recreation uses are summarized in Section 2.20 of this document.

### Short-Term Land Use Impacts of the SOCTIIP Build Alternatives

During the construction of a SOCTIIP build Alternative, existing or planned land uses may be affected by temporary impacts such as dust, noise, views of construction and disturbed areas, and/or disruptions to surface transportation access. These potential short-term impacts of the SOCTIIP build Alternatives are discussed in detail in the short-term impact analyses in the air quality, noise, visual, and traffic sections of the Final SEIR, respectively.

Another potential short-term impact of the SOCTIIP build Alternatives related to land use would be associated with the recycling of previously developed lands that were acquired and cleared of the existing development to accommodate construction of the Alternative. These are areas needed during construction, but are outside the permanent right-of-way area. These leftover parcels, called remainder parcels, may be large enough on their own or may potentially be combined to provide new parcels available for development. Remainder parcels that are large enough for reuse would be sold after completion of the construction of the SOCTIIP build Alternative and would be subject to independent environmental evaluation for any planned land use. Uneconomic parcels that are too small for reuse may be retained as part of the right-of-way. Since the Preferred Alternative transects only two major parcels (RMV and MCB Camp Pendleton), and cooperation planning has and

continues to guide specific planning of the Ranch Plan, remainder parcels are not expected to be a significant issue for the Preferred Alternative.

### Coastal Zone Impacts

Implementation of the Proposed FTC-S is consistent with adopted regional transportation plans, which reflect the proposed project that has been on the MPAH since 1981.

All of the project area within the Coastal Zone is owned by the U.S. Department of Navy (DON), and therefore, local plans and zoning are not applicable.

There are three recreation resources on MCB Camp Pendleton in the Coastal Zone in the vicinity of where the Preferred Alternative is proposed: SOSB Subunit 2, SOSB Subunit 3, and the MCP Camp Pendleton San Onofre Recreation Beach, which is not part of the State Park lease area. Temporary adverse construction noise impacts of the Preferred Alternative in the Coastal Zone are anticipated at these resources, and short-term dust and construction emissions may result in temporary adverse impacts to SOSB Subunit 2. Please see Section 2.20 of this document for more information.

The Preferred Alternative indirect impacts to SOSB include operational noise and air quality emissions; however, these effects were compared to existing conditions in accordance with CEQA. The existing conditions include the operation of I-5 adjacent to these resources. The Preferred Alternative will not adversely affect permanent access to and from recreation resources in the Coastal Zone.

The Preferred Alternative will result in changes in views from SOSB Subunit 2, MCB Camp Pendleton Green Beach and San Onofre Recreation Beach. Please see Section 2.13 for more information.

Other existing land uses in the Coastal Zone are military training-related uses. Please see Section 2.16 for more information regarding impacts to MCB Camp Pendleton and its military training mission.

## 2.1.4 MITIGATION

Mitigation measures are also listed in the Mitigation Monitoring and Reporting Program in Appendix A of this document.

All temporary use and permanent acquisition of right-of-way for the build Alternatives will be conducted consistent with the requirements of the Uniform Relocation and Assistance Real Property Acquisition Polices Act of 1970, as amended, and California Government Code, Chapter 16, Section 7260, et seq. A mitigation measure regarding compliance with these Acts for all temporary use and permanent acquisition of property for the build Alternatives is included in Section 4.4 (Affected Environment, Impacts and Mitigation Measures Related to Socioeconomics and Environmental Justice). That measure, as referenced in this section, would also apply to some of the land use impacts of the SOCTIIP build Alternatives.

In addition to the mitigation measures below, PDF-2-1 (see Section 2.5 of the Final SEIR) calls for the use of retaining walls in some locations in the final design in order to minimize the amount of grading and to reduce project impacts. This application of retaining walls is intended to reduce potential impacts to both the built and natural environment.

Also, in addition to the mitigation measures below are noise, air quality, aesthetic, and recreation mitigation measures as included in Sections 2.5, 2.6, 2.16, and 2.20 of this document.

Mitigation Measure LU-1 below applies to the entire FTC-S corridor, including the portion in the Coastal Zone. Measure LU-2 is specific to the TRW Capistrano test site, which is located outside the Coastal Zone and therefore is not applicable to land uses within the Coastal Zone. The measure provides for a relocated access road for the TRW Capistrano test site.

**PDF 2-1** **Retaining Walls for the Corridor Alternatives.** Retaining walls will be provided in some locations along the alignments of the corridor Alternatives. Retaining walls can be used to minimize or reduce the amount of grading in areas with substantial topography, or to minimize or reduce right-of-way takes in developed areas. The specific locations of retaining walls will be refined in final design if a corridor Alternative is selected for implementation.

**LU-1** **Impacts on Existing Land Uses.** If a SOCTIIP build Alternative is selected, design refinements to avoid or minimize impacts to existing land uses related to the temporary use and/or permanent acquisition of property will be incorporated in the final design of the selected Alternative, where prudent and feasible.

## 2.1.5 CONCLUSION

The Ranch Plan was approved after publication of the SOCTIIP Draft EIS/SEIR. The Ranch Plan depicted an alignment of the FTC-S as shown on the MPAH; however, the property owner, RMV, acknowledged that if another alignment is selected, the Ranch development plan will be adjusted to accommodate the selected alignment. Therefore, subsequent actions by the TCA and other transportation agencies regarding the selection and implementation of an SOCTIIP Alternative have not and will not adversely affect the Ranch Plan approval already in place or the Plan as revised by the Settlement Agreement.

The Preferred Alternative will not require the acquisition of any existing homes or businesses. Furthermore, there are no substantive indirect impacts to existing sensitive land uses addressed in this section given the siting of the proposed facility to minimize impacts to existing uses combined with existing topography and committed open space areas that create "buffers" between the Preferred Alternative and existing uses.

Construction of the Preferred Alternative will require the use of land for temporary construction staging, materials storage, equipment storage, and other activities during construction only. The temporary impact area for construction staging is included in the disturbance limits for the project. At the completion of construction of a SOCTIIP build Alternative, these areas would no longer be needed for the SOCTIIP build Alternative. The Draft EIS/SEIR found that the short-term use of this land for construction of the SOCTIIP build Alternatives would not be an adverse impact. The

Preferred Alternative refinements resulted in a net reduction in the total disturbance area limits, and the new disturbance area limits include areas needed for construction staging. Therefore, the short-term land use impact associated with construction staging has been further minimized by the Preferred Alternative refinements.

Demolition and construction of the utilities will occur prior to the grading for the proposed roadway and will be conducted in a manner that ensures the continuous provision of power to San Diego Gas and Electric (SDG&E) and Southern California Edison (SCE) customers. It is anticipated that construction of the relocated utilities will occur during low-usage months in the winter. The potential land use impacts of the construction activities associated with utility demolition and construction are within the disturbance limits and the overall envelope of impacts evaluated for the Preferred Alternative. No new short-term land use impacts would occur as a result of the demolition and construction of utilities. Utility relocating within the Coastal Zone is described in Section 2.19 of this document.

There are three recreation resources on MCB Camp Pendleton in the Coastal Zone in the vicinity where the Preferred Alternative is proposed: SOSB Subunit 2, SOSB Subunit 3, and the MCP Camp Pendleton San Onofre Recreation Beach, which is not part of the State Park lease area. Temporary adverse construction impacts of the Preferred Alternative in the Coastal Zone are anticipated at these resources. The proposed project will not preclude the continued permanent use of all of these resources for recreation purposes, which are currently located adjacent to existing I-5. Please see Section 2.20 of this document for more information regarding impacts to recreation uses in the Coastal Zone.

# 2.2 FARMLAND

## 2.2.1 INTRODUCTION

Potential impacts to agricultural resources are usually assessed when a project has the potential to convert prime farmland, unique farmland, or farmland of statewide significance to nonagricultural uses; potentially conflicts with existing zoning for agricultural use or with a Williamson Act Contract; or involves other changes in the existing environment that, due to their location or nature, would result in the conversion of certain farmland to nonagricultural use. The term agricultural "resource" refers specifically to Natural Resources Conservation Service (NRCS) rated lands, prime, unique, or of statewide importance. Potential impacts to Farmland are evaluated in detail in the Land Use Technical Report (P&D Consultants, 2003) and are summarized in Section 4.3 of the Final SEIR.

## 2.2.2 SETTING

### Farmland Classifications

The preservation of agricultural resources and activities has been an explicit goal of the California Department of Conservation (CDC) and the United States Department of Agriculture (USDA). The USDA NRCS provides information and consults with federal agencies sponsoring a project that could contribute to the conversion of agricultural land to nonagricultural uses. The CDC Division of Land Resource Protection provides information, maps, funding, and technical assistance, including the Farmland Mapping and Monitoring Program and interpretation and enforcement of Williamson Act Contracts and other agricultural land conservation programs.

For the purpose of inventorying land, categorical definitions of important farmlands were developed by the NRCS. These definitions gave recognition to the land's suitability for agricultural production. The CDC initiated a Farmland Mapping and Monitoring Program in 1980 to supplement the efforts of the NRCS. Seven categories of land use are identified in the Farmland Mapping and Monitoring Program: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban and Built-Up Land, and Other Land. These land classifications are described as follows:

**Prime Farmland.** This type of land has the best combination of physical and chemical features able to sustain long-term production of agricultural crops. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for the production of irrigated crops at some time during the two previous map updates.

**Farmland of Statewide Importance.** This is land similar to Prime Farmland that has a good combination of physical and chemical features able to sustain long-term production of agricultural crops. This land has minor shortcomings such as greater slopes or less ability to store moisture than

Prime Farmland. The land must have been used for the production of irrigated crops at some time during the two previous map updates.

**Unique Farmland.** This designation is for lower-quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated but may include nonirrigated orchards or vineyards, as found in some climatic zones in California. This land is used for the production of specific high economic value crops such as oranges, olives, avocados, rice, grapes, or cut flowers. Land must have been cropped at some point during the two previous map updates.

**Farmland of Local Importance.** This is land of importance to the local agricultural economy as determined by each county's Board of Supervisors and a local advisory committee.

**Other Land.** Land that does not meet the criteria of any other category receives this designation.

## Study Area Setting

Agricultural resources and activities are located in two main areas in the Foothill Transportation Corridor-South (FTC-S) study area: Rancho Mission Viejo (RMV) and Marine Corps Base (MCB) Camp Pendleton adjacent to San Onofre State Beach (SOSB). San Juan Capistrano was historically an agricultural community. Although much of the land used for agriculture in the City has been developed in urban uses, there are remaining private parcels that continue in agricultural production.

In the FTC-S study area, 7,275.7 acres (ac) have been classified as Prime Farmland, 5,394.5 ac have been classified as Unique Farmland, and 562.7 ac have been classified as Farmland of Statewide Importance by the NRCS. The remaining area has either not been rated by the NRCS or has been rated in a category not related to agriculture or soils. There are also 34,720 ac of land that were held as agricultural preserve agreements under the Williamson Act in the SOCTIIP study area.

According to the Draft Program EIR for The Ranch Plan, notices of nonrenewal of Williamson Act agreements were filed for all the areas on the RMV property, and the "lands will be removed from the preserve between December 31, 2005 and December 31, 2008, regardless" of The Ranch Plan project as a result of the nonrenewal process (Draft Program EIR No. 589, page 4.2-11). The agricultural preserves on RMV are in three groups with three different expiration dates. The expirations occurred or will occur on December 31, 2005 (289 ac); December 31, 2006 (1,733 ac); and December 31, 2008 (7,818 ac).

Lands on MCB Camp Pendleton are not subject to agricultural preserves under the Williamson Act because they are federally owned. In addition, the agricultural lease agreement on MCB Camp Pendleton expired in December 2005 and has not been renewed. This area is now being used for military training purposes.

### Coastal Zone Setting

Approximately 2.94 ac in the disturbance limits of the proposed project within the Coastal Zone have been classified as Prime Farmland. There is no Unique Farmland or Farmland of Statewide Significance as defined by the NRCS in the project disturbance limits in the Coastal Zone.

There are no lands classified as grazing land on MCB Camp Pendleton, and lands on MCB Camp Pendleton are not subject to agricultural preserves under the Williamson Act because they are federally owned. In addition, the agricultural lease agreement on MCB Camp Pendleton expired in December 2005 and has not been renewed.

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements being required by the Marine Corps. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

No additional information or reports pertaining to farmland have been submitted to the Federal Highway Administration (FHWA) or The Transportation Corridor Agencies (TCA) since certification of the Final SEIR, with the exception of information pertaining to the agricultural lease expiration on MCB Camp Pendleton. As of December 2005 there are no active agricultural uses in the SOCTIIP study area in the Coastal Zone.

## 2.2.3 IMPACTS

### Project Impacts

**Rancho Mission Viejo.** The proposed project would not result in the loss of rated farmland as defined by the NRCS on RMV. Therefore, the Preferred Alternative would not adversely impact farmlands on RMV and would not require evaluation of protection of these farmlands or the consideration of avoidance alternatives.[1]

The proposed project would result in the loss of approximately 202 ac of Williamson Act Agricultural Preserves on RMV. This includes areas that have been subject to a notice of nonrenewal, with the remainder currently remaining in agricultural preserve status. Williamson Act contracts adjacent to the Preferred Alternative are scheduled for withdrawal between 2001 and 2008. While some of these areas will be withdrawn from agricultural preserves prior to construction of the proposed project, a

[1] Source: California Department of Conservation, Orange County agricultural land use data, 2000.

substantial part of the property will remain in agricultural preserves. However, the Preferred Alternative would only traverse an area of 60.46 ac noticed for nonrenewal in 2008. If grading starts in the 60.46 ac area before the nonrenewal goes into effect in 2008, the proposed project would adversely impact areas in agricultural preserves. The proposed project would not preclude the use of remaining preserve areas and would not require early cancellation of any contracts outside the disturbance limits.

The proposed project would affect 689.0 ac under the Initial and 777.5 ac under the Ultimate of lands classified as grazing lands. The Preferred Alternative would affect approximately 191 ac less grazing land than the A7C-FEC-M-Initial and approximately 279 ac less than the A7C-FEC-M-Ultimate. The loss of this acreage would not preclude grazing activities on the remaining land and therefore is not considered an adverse impact. There are no other impacts to agricultural or ranching uses on RMV as a result of the proposed project.

The proposed project would affect approximately 7.67 ac of rated agricultural land on MCB Camp Pendleton, of which approximately 2.94 ac are within the Coastal Zone. It should be noted that as of December 2005, none of this land is in agricultural use. All of the agricultural leases expired and have not been renewed. The land is now being used for military training purposes.

There are no lands classified as grazing land on MCB Camp Pendleton, and lands on MCB Camp Pendleton are not subject to agricultural preserves under the Williamson Act because they are federally owned.

### Impacts in the Coastal Zone

Approximately 2.94 ac in the FTC-S disturbance limits within the Coastal Zone have been classified as Prime Farmland. The impact area is located north of I-5 where the proposed project, including an extended detention basin, requires use of a former agricultural field adjacent to the existing I-5. There is no Unique Farmland or Farmland of Statewide Significance as defined by the NRCS in the SOCTIIP Study Area in the Coastal Zone. The proposed project will result in a significant farmlands impact to prime farmland in the coastal zone.

There are no lands classified as grazing land on MCB Camp Pendleton, and lands on MCB Camp Pendleton are not subject to agricultural preserves under the Williamson Act because they are federally owned. Therefore, none of the land in the coastal zone in the study area is subject to Williamson Act Contracts, and the proposed project will not result in a significant impact related to Williamson Act Contacts in the Coastal Zone.

## 2.2.4 MITIGATION

The mitigation measures included in the Final SEIR are listed in Appendix A of this document, the Mitigation Monitoring and Reporting Program. There are no measures applicable to agricultural resources in the Coastal Zone. Mitigation Measures AG-1 and AG-2 address existing operations on RMV. Mitigation Measure AG-3 applies to agricultural resources on MCB Camp Pendleton; however, it is no longer applicable because all agricultural operations on MCB Camp Pendleton have ceased.

## 2.2.5 CONCLUSION

The agricultural land that would have been lost due to the Preferred Alternative within Camp Pendleton is land that was leased by Camp Pendleton for farming uses. The agricultural lease agreement on MCB Camp Pendleton has since expired and the agricultural use has been terminated. TCA had determined that mitigation through agricultural preservation or an easement is not feasible. Based on the U.S. ownership of Camp Pendleton and the committed land uses in south Orange County, no parcels are available in the general vicinity for such easements or preservation. MCB Camp Pendleton has terminated agricultural leases on the Base and has no plan to reinstate agricultural uses. Also, since MCB Camp Pendleton has terminated agricultural leases, there is no impact for which TCA needs to evaluate mitigation.

In summary, review of the California Department of Transportation's Community Impact Assessment (CIA) Guidelines and published court decision on mitigation measures for loss of agricultural land did not result in the identification of specific feasible mitigation measures for agricultural resources impacts under the SOCTIIP build Alternatives. Therefore, impacts to agricultural resources remain significant and unavoidable after implementation of the mitigation measure above.

# 2.3 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

## 2.3.1 INTRODUCTION

This section provides a summary of the Socioeconomics and Environmental Justice impacts for the Preferred Alternative and describes existing socioeconomic conditions in the project study area and the project study area located within the Coastal Zone. Data for the larger regional area are also included to provide context as to the similarities, differences, and relationships between the study area and the overall region. Information is presented for the following existing socioeconomic parameters:

- Existing and projected population, housing, and employment
- Demographic and socioeconomic characteristics
- Fiscal characteristics, including property valuation and taxable sales

Socioeconomics and Environmental Justice are analyzed in the Socioeconomics and Growth Inducing Impacts of South Orange County Transportation Improvement Project (SOCTIIP) Technical Report (P&D Consultants, 2003) and in Section 4.4 of the Final SEIR.

## 2.3.2 SETTING

### Study Area Setting

**SOCTIIP Study Area for Socioeconomics and Environmental Justice.** The study area consists of communities potentially directly impacted by the alignments of the SOCTIIP build Alternatives and the communities immediately adjacent to the alignments. This area is generally comprised of South Orange County.

The study area is divided into smaller geographic units called Community Analysis Areas (CAAs). CAAs were developed by Orange County for subcounty area forecasting. Orange County is divided into 70 CAAs. The CAAs in the SOCTIIP study area are CAAs 53, 57 to 60, 62 to 64, and 66 to 70.

The communities in the SOCTIIP study area are the incorporated Cities of Aliso Viejo, Lake Forest, Laguna Hills, Laguna Woods, Mission Viejo, Laguna Niguel, Rancho Santa Margarita, San Juan Capistrano, Dana Point, and San Clemente. The study area also includes the unincorporated area of Rancho Mission Viejo (RMV) and the unincorporated communities of Las Flores, Coto De Caza, Ladera Ranch, and Talega. RMV is directly southeast of Mission Viejo and extends south to the Orange County and San Diego County line, east of San Clemente. RMV accounts for the majority of the unincorporated area in the SOCTIIP study area, covering 9,254 hectares (ha) (22,850 acres [ac]). Las Flores Planned Community (PC) is east of Mission Viejo near Oso Parkway, where it intersects with Antonio Parkway. Further east is Coto De Caza, which includes the Wagon Wheel development in the southern part of the community near the intersection of Oso Parkway and Altura. Coto De Caza extends north beyond the SOCTIIP study area. The Ladera PC is east of Marguerite Parkway. The majority of Ladera PC is southwest of the intersection of Crown Valley Parkway and Antonio

Parkway, with a small area north of Crown Valley Parkway. The northeast part of San Clemente is designated as the Talega PC. The Talega PC also extends north and east of San Clemente and includes the Rolling Hills PC in unincorporated Orange County and The Donna O'Neill Land Conservancy.

The study area also includes the service areas of Capistrano Unified School District (CUSD), Saddleback Valley Unified School District (SVUSD), and Irvine Unified School District (IUSD). The CUSD service area includes parts of the Cities of Dana Point, Laguna Niguel, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano and part of unincorporated Orange County. The CUSD services approximately 45,000 students in a 505-square-kilometer (km) (195-square-mile [mi]) area. CUSD facilities include 32 elementary schools, 8 middle schools, 4 high schools, 1 alternative education campus, and 1 adult education campus. Future CUSD facilities in the SOCTIIP study area include a high school.

The SVUSD service area includes parts of Mission Viejo, Lake Forest, Rancho Santa Margarita, and Trabuco Canyon. SVUSD facilities include 26 elementary schools, 4 intermediate schools, 4 high schools, and 2 alternative education campuses.

The IUSD service area is primarily in the City of Irvine. The IUSD serves approximately 24,000 students in 22 elementary schools, 8 middle schools, and 6 high schools, including continuation and independent study high schools. The IUSD does not have any existing or planned facilities near the alignments of the SOCTIIP build Alternatives.

**Population Characteristics and Trends.** The regional population is expected to increase from an estimated 2.8 million persons in 2000 to over 3.4 million persons by 2025. This equates to a total increase of 562,300 persons, or an annual rate of increase of 0.7 percent per year over the period in the region.

The SOCTIIP study area was home to almost 482,000 persons in 2000, or 17 percent of the population in the Orange County region. By 2025, the population in the SOCTIIP study area is forecast to increase by 145,700 persons, to 627,600, an annual increase of 1.1 percent. By 2025, the SOCTIIP study area is expected to account for 18 percent of the population in the Orange County region.

Three CAAs, 59, 60, and 70, are expected to account for the majority of forecast growth in the SOCTIIP study area. Population in these three CAAs is forecast to increase by almost 97,600 persons between 2000 and 2025 and will account for 67 percent of total population growth in the SOCTIIP study area. These three CAAs are in unincorporated Orange County and include Ladera and Talega PCs and the RMV property. The RMV property is largely undeveloped and in agricultural holding or open space General Plan designations. The Orange County Projections 2000 (OCP-2000 Center for Demographic Research, Orange County Projections-2000, no date) forecasted that future development of the RMV property would include approximately 21,000 dwelling units (dus). However, RMV has submitted development plans that call for 14,000 dus and less associated population than is assumed in the OCP-2000 forecasts.

**Housing Characteristics and Trends.** In the region, housing is expected to increase from an estimated 978,000 dus in 2000 to over 1.1 million dus by 2025. This is a total increase of 137,800 dus, or an annual rate of increase in the region of 0.5 percent per year over the period.

There were more than 187,000 dus in the SOCTIIP study area in 2000, or 19 percent of the housing in the Orange County region. By 2025, housing in the SOCTIIP study area is forecast to increase by almost 47,000 dus, to 234,600, an annual increase of 0.9 percent. By 2025, the SOCTIIP study area is expected to account for 21 percent of the total dus in the Orange County region.

CAAs 59, 60, and 70 are expected to account for the majority of forecast growth in the SOCTIIP study area. Housing in these three CAAs is forecast to increase by almost 35,900 dus between 2000 and 2025 and account for 76 percent of total housing growth in the SOCTIIP study area. These three CAAs in unincorporated Orange County include the Ladera and Talega PCs and the RMV property. The Ladera and Talega PCs have approved development plans and account for approximately 13,100 of the dus in these CAAs. The RMV property is currently largely undeveloped. OCP-2000 assumed that future development of the RMV property would include 21,000 dus. However, RMV has submitted development plans that call for 14,000 dus and less associated population than is assumed in the OCP-2000 forecasts.

**Employment Characteristics and Trends.** Employment in the region is expected to increase from an estimated 1.5 million jobs in 2000 to almost 2.1 million jobs by 2025. This will be a total increase of 541,000 jobs, or an annual rate of increase in the region of 1.2 percent per year over the period.

There were more than 207,000 jobs in the SOCTIIP study area in 2000, or 14 percent of the employment in the Orange County region. By 2025, employment in the study area is forecast to increase by 97,700 jobs, to 304,938, an annual increase of 1.6 percent. By 2025, the SOCTIIP study area is expected to account for 15 percent of the total jobs in the Orange County region.

The following CAAs in the study area are expected to account for almost 75 percent of the forecasted growth in employment:

| | | |
|---|---|---|
| CAA 53 (Spectrum in Irvine) | 21,807 jobs | 22 percent of the SOCTIIP study area |
| CAA 59/60 (Unincorporated) | 23,622 jobs | 24 percent of the SOCTIIP study area |
| CAA 63 (Laguna Hills) | 16,994 jobs | 17 percent of the SOCTIIP study area |
| CAA 69 (San Clemente) | 10,977 jobs | 11 percent of the SOCTIIP study area |

## Demographic and Socioeconomic Characteristics

### Housing Characteristics.

**Housing Supply.** Historically, the rate of growth in the supply of housing in the SOCTIIP study area has exceeded the rate in the region as a whole. Between 1980 and 2000, the supply of housing in the SOCTIIP study area more than doubled, compared to a 34 percent increase in the region as a whole. While the overall rate of growth in housing supply is expected to decline, this trend is forecast to continue in the future by the Center for Demographic Research (CDR), the organization responsible for preparing the official Orange County forecasts. This forecast is based on consideration of local, regional, State, national, and international forces that affect growth. The forecasts expect continued population and employment growth in Orange County and the

SOCTIIP study area, leading to additional demand for housing. Details of the forecast methodology and assumptions are provided in OCP-2000. Between 2000 and 2025, the supply of housing in the SOCTIIP study area is projected to increase by 24 percent, compared to 15 percent in the region as a whole.

The rate of growth in individual communities in the SOCTIIP study area is expected to vary widely. The Cities of Dana Point, Mission Viejo, Laguna Niguel, Laguna Hills, Laguna Woods, and Lake Forest are at or near build out and are forecast to experience little or no growth over the next 25 years. The Cities of San Clemente and San Juan Capistrano are projected to experience moderate growth over this period. As noted previously, the majority of growth in housing in the SOCTIIP study area is projected to occur in the unincorporated areas in the southeast part of the study area, including the Ladera and Talega PCs and RMV.

According to United States Census data, there were 165,500 dus in incorporated cities in the SOCTIIP study area in 2000 compared to a total of 968,300 dus in the region as a whole. Cities in the SOCTIIP study area have a higher proportion of single-family detached and attached housing (71 percent) than the region as a whole (64 percent). The SOCTIIP study area has a smaller share of multiple family units (both for sale and rent) than in the region as a whole. With the exception of San Juan Capistrano and Lake Forest, incorporated cities in the SOCTIIP study area have a smaller share of mobile homes than the region as a whole.

**Tenure and Vacancy Rates.** Owner occupied housing units represent a larger share of total occupied housing in the SOCTIIP study area than the region as a whole. In 2000, almost 74 percent of occupied housing in the SOCTIIP was owner-occupied compared to 59 percent in the region as a whole. This trend is generally reflected in all incorporated cities in the SOCTIIP study area.

Housing vacancy rates in the SOCTIIP study area are higher than the region as a whole. In 2000, 4.4 percent of housing units in the SOCTIIP study area were vacant compared to 3.5 percent in the region as a whole. Vacancy rates in incorporated cities in the SOCTIIP study area range from a low of 1.6 percent in Mission Viejo to a high of 7.8 percent in Dana Point.

**Housing Values and Rental Rates.** Based on 2000 United States Census data, the value of housing in the SOCTIIP study area is higher than in the region as a whole. In 2000, the median value of an owner-occupied housing unit in the SOCTIIP study area was almost $325,500 compared to $270,000 in the region. This trend is consistent throughout the incorporated cities in the SOCTIIP study area.

Rental rates were also higher in the SOCTIIP study area compared to the region as a whole. In 2000, the average monthly rental rate in the SOCTIIP study area was $1,123 compared to $923 in the region. This trend is consistent throughout the incorporated cities in the SOCTIIP study area.

## Population Characteristics

**Population Growth Trends.** Historically, the rate of growth in population in the SOCTIIP study area has exceeded the rate in the region as a whole. Between 1980 and 2000, population in the SOCTIIP study area increased by 132 percent, compared to 47 percent in the region. The study area for the SOCTIIP has experienced relatively rapid development in the last 15 years. The rapid growth in southern Orange County predominantly occurred from the mid 1980s to the present, as illustrated by the large number of new cities incorporated in south Orange County during this period. With the exception of the Cities of Irvine, Laguna Beach, San Clemente, Laguna Hills, and San Juan Capistrano, virtually all the cities in the SOCTIIP study area were incorporated in the late 1980s or 1990s: Lake Forest (incorporated 1991), Mission Viejo (1988), Dana Point (1989), Laguna Niguel (1989), Laguna Woods (1999), Rancho Santa Margarita (2000), and Aliso Viejo (2001). Most of these incorporations consisted of one large PC or the consolidation of several PCs into one city. In addition, the growth and annexation patterns for the Cities of San Juan Capistrano and San Clemente extended predominantly inland during this period.

This population growth trend is expected to continue in the future, although at a slower overall rate. Based on the OCP-2000 forecasts prepared by CDR, population in the SOCTIIP study area is expected to increase by 32 percent between 2000 and 2025, compared to an increase of 20 percent in the region over the same period. This forecast is based on consideration of local, regional, State, national, and international forces that affect growth. The majority of future growth in population in the SOCTIIP study area is projected to occur in the unincorporated areas in the southeast part of the study area, including the Ladera and Talega PCs and RMV.

**Demographic Characteristics.** The distribution of males versus females is similar in the SOCTIIP study area, incorporated cities in the SOCTIIP study area (with the exception of Laguna Woods, due to the older population in that City and the resulting greater female population due to the greater longevity of women versus men), and the region as a whole, at roughly 50/50. The percentage of elderly population is somewhat higher in the SOCTIIP study area than the region, at 11.3 percent in the SOCTIIP study area compared to 9.9 percent in the region.

**Disability Characteristics.** The percentage of disabled population in the SOCTIIP study area is smaller than in the region as a whole. In 2000, disabled persons represented 12.2 percent of the population in the SOCTIIP study area compared to 15.2 percent in the region.

**Ethnic Characteristics.** Minority populations, defined as the nonwhite population using 2000 Census data, represent a smaller share of total population in the SOCTIIP study area than the region overall. In 2000, minorities represented almost 17 percent of the SOCTIIP study area population compared to 35 percent in the region. This trend is consistently represented throughout the incorporated cities in the study area.

## Household Characteristics

**Household Income.** Household income in the SOCTIIP study area is higher than in the region. In 1999, the median household income in the SOCTIIP study area was almost $70,977 compared to $58,820 in the region.

**Transit-Dependent Households.** Transit-dependent households, defined as households without a vehicle, represent a smaller share of total households in the SOCTIIP study area compared to the region. In 2000, transit dependent households accounted for 4.2 percent of SOCTIIP study area household versus 5.8 percent in the region.

**Low Income Households.** There is a smaller share of households with below-poverty level incomes in the SOCTIIP study area than in the region. The 2000 Census defines the below-poverty level as families with incomes below the 1999 Office of Management and Budget poverty thresholds that vary by family size and composition. In 1999, 3.0 percent of households in the SOCTIIP study area had incomes below the poverty level compared to 7.0 percent in the region.

## Employment Characteristics

**Labor Force, Employment, and Unemployment.** The SOCTIIP study area has a lower labor force participation rate than in the region. Labor force participation rate is defined as the persons in the labor force divided by total population. In 2000, almost 49 percent of the population in the SOCTIIP study area was in the labor force compared to 53 percent in the region. Unemployment rates in the SOCTIIP study area were lower than in the region. In 2000, 1.8 percent of the labor force in the SOCTIIP study area was unemployed compared to 2.5 percent in the region.

**Jobs by Location.** In 2000, there were an estimated 207,200 jobs in the SOCTIIP study area, 14 percent of the 1.5 million total jobs in the region. This is lower than the SOCTIIP study area's regional share of population and housing. Estimated jobs in incorporated cities in the SOCTIIP study area range from 2,535 jobs in Laguna Woods to 34,010 jobs in Lake Forest.

## Fiscal Characteristics

The major sources of public revenues to the incorporated cities and unincorporated Orange County in the SOCTIIP study area and region are property and sales taxes. These revenue sources may potentially be affected by property acquisition and resident and business relocation requirements generated by the SOCTIIP build Alternatives. The fiscal characteristics described in this Section include assessed property valuation, which is directly related to the level of property tax revenues available to communities, and taxable sales, which are directly related to the level of sales tax revenues available to communities.

**Assessed Property Valuation.** Assessed property valuation for jurisdictions in the SOCTIIP study area totaled almost $71 billion in fiscal year 2001/2002 (FY 2001/2002). Assessed valuation in the region totaled $244 billion.

Property tax revenues represent a major source of funding for the three school districts in the SOCTIIP study area. Assessed valuation in the school districts in the SOCTIIP study area totaled $73 billion in FY 2001/2002.

**Taxable Sales.** As noted, taxable sales for the various jurisdictions in the SOCTIIP study area totaled $4.9 billion in 2000. Taxable sales in the region totaled $44 billion.

### Coastal Zone Setting

The communities within the Coastal Zone and broader SOCTIIP study area are the southern portion of the City of San Clemente and housing on the northern portion of the MCB Camp Pendleton. Because of the temporary nature of military housing, impacts to any housing on MCB Camp Pendleton are not considered socioeconomic or environmental justice impacts and are not evaluated in this section.

The Preferred Alternative in the Coastal Zone is located on MCB Camp Pendleton and does not result in the displacement of any military housing units. The Preferred Alternative in the Coastal Zone is located in open area and used for military training purposes.

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements being required by the Marine Corps. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The refinements to the project on MCB Camp Pendleton do not impact any existing homes or businesses, including no impact to military housing. The project refinements are enhancements that support security and the military training mission of the Base.

## 2.3.3 IMPACTS

### Project Impacts

This section evaluates the potential socioeconomics and Environmental Justice impacts of the SOCTIIP Alternatives related to:

- Residential, nonresidential, and agricultural displacement
- Community cohesion
- Economic impacts
- Environmental justice

## Short-Term Construction Impacts Related to Socioeconomics and Environmental Justice

### Residential, Nonresidential, and Agricultural Displacements.

**Residential Displacements.** The number of displaced persons was estimated using 2000 Census vacancy rate and average household size data. Detailed information on displacement and relocation is provided in the Relocation Impacts Technical Report of the Final SEIR. Since publication of the Draft EIS/SEIR, construction has been initiated for several new phases of the Champion Hills (Talega) Specific Plan. The practical effect of the continued home construction in Talega is that some project Alternatives will displace more homes than what was reported in the Draft EIS/SEIR. This is not a new significant impact because the Draft EIS/SEIR acknowledged that Talega would continue to build out, and displacements of some Alternatives would increase. The displacement numbers provided below have been updated to reflect construction of homes in Talega since circulation of the Draft EIS/SEIR.

The Preferred Alternative would not result in the displacement of any residences or residents.

**Business, Institutional, and Nonprofit Displacement.** Information is provided regarding the number and type of displaced nonresidential uses, estimated number of displaced employees, estimated displaced firms by employment size, and the number of displaced nonresidential parcels. Refer to Appendix L of the Final SEIR for a detailed list by address of these displacements. Detailed information on displacement and relocation is provided in the Relocation Impacts Technical Report.

The Preferred Alternative would not result in the displacement of any businesses or employees.

**Agricultural Displacements.** Information is provided regarding the number, type, and acreage of displaced agricultural uses. Detailed information on displacement and relocation is provided in the Relocation Impacts Technical Report. Existing agriculture use is located on the RMV property outside the Coastal Zone. The RMV property is planned for development and open space preservation in accordance with the approved Ranch Plan and Settlement Agreement.

The Preferred Alternative would not displace any agricultural uses. The construction and operation of the Preferred Alternative would not preclude the use of agricultural areas outside of the project footprint. The agricultural leases on MCB Camp Pendleton has expired since publication of the Draft EIS/SEIR and certification of the Final SEIR.

### Replacement Resources

Adequate and affordable replacement resources such as residential, nonresidential, and agricultural lands would be available for resources impacted under the SOCTIIP build Alternatives, as discussed in detail in the Relocation Impacts Technical Report.

The Preferred Alternative would not result in adverse impacts related to replacement resources.

### Community Cohesion

As stated in Caltrans guidelines for community impact assessment, community cohesion is the degree to which residents have a "sense of belonging" to their neighborhood, a level of commitment of the residents to the community, or a strong attachment to neighbors, groups, and institutions. Transportation projects may divide cohesive neighborhoods when they act as physical barriers or where they are perceived as psychological barriers by the residents. A transportation project that modifies, interferes with, or terminates access to community facilities and services may also affect community cohesion. Construction of the SOCTIIP build Alternatives could have an adverse impact on community cohesion if an alternative (1) divides an existing neighborhood, thereby restricting access within the community or to community facilities and services, or (2) displaces community facilities or services.

The Preferred Alternative would not result in adverse impacts related to community cohesion because it does not divide an existing neighborhood or displace community facilities or services.

### Economic Impacts

Property acquisition and the associated displacement and relocation of residences and businesses as a result of the construction of the SOCTIIP build Alternatives will generate economic impacts to the communities and jurisdictions in the study area. These impacts could include loss of property tax revenues, sales tax revenues, and transit occupancy tax (TOT) revenues by cities and unincorporated Orange County; loss of property tax revenues to school districts; loss of employment opportunities due to displaced businesses; increases in rate payer costs and reduced tipping fee revenue due to loss of landfill capacity at Prima Deshecha Landfill; construction-related impacts to employment, business, and tax revenues and benefits from congestion relief and improved mobility, as discussed below.

**Property Tax Revenues.** The Preferred Alternative could impact local property tax revenues. In general, the impact is minor, at less than 1 percent of the total local property tax revenues, and should not adversely affect the local jurisdictions' revenue bases.

The Preferred Alternative could impact school district property tax revenues. In all cases, the impact is minor, at less than 1 percent of school district property tax revenues, and should not substantially affect the revenue bases of the three school districts in the SOCTIIP study area. Nonetheless, this reduction in school district financial resources is an adverse impact of the construction of the Preferred Alternative.

**Sales Tax Revenues.** The Preferred Alternative would not result in any impacts related to sales tax revenues because no businesses are directly impacted or displaced.

**Transit Occupancy Tax (TOT) Revenues.** The Preferred Alternative would not result in any impacts to hotels or similar uses and therefore no impacts related to TOT revenues.

**Loss of Employment Opportunities.** The Preferred Alternative would not result in any impacts related to lost employment opportunities because there is no displacement of existing businesses.

**Capacity and Lifespan of Prima Deshecha Landfill.** The Preferred Alternative does not transect Prima Deshecha Landfill and would not result in direct impacts to the Landfill.

**Construction Related to Employment.** Construction of the SOCTIIP build Alternatives, including the Preferred Alternative, would have a short-term effect on employment and business in the area. Employment experience related to highway construction compiled by Caltrans indicates that each $10 million in design and construction costs generates approximately 323 direct and off-site jobs. Total construction-related jobs generated by the various Alternatives range up to 43,000. Not all of these jobs would be located in the study area. The actual timing and geographic distribution of these jobs will depend on the construction phasing of the project, as well as the locations of the individual firms retained to complete the work. However, it is expected that the local economy would capture a substantial share of this employment. This would be a beneficial effect of all of the SOCTIIP build Alternatives.

In addition to these construction jobs, construction workers would likely patronize local businesses, thereby generating short-term revenue increases in the local area. The short-term revenue increases would, in turn, result in a short-term increase in sales tax revenues to the local jurisdictions. This would be a beneficial effect of the build Alternatives. However, this effect of construction activity on local businesses and tax revenues cannot be quantified.

**Established Business Districts.** The Preferred Alternative does not transect any existing business districts. The Preferred Alternative would not result in adverse impacts related to any business districts. Local business districts in south Orange County may benefit from the increased mobility and access provided by FTC-S.

**Travel Time Saving from Congestion Relief.** Section 3.0 (Traffic and Circulation) of the Final SEIR documents the travel time savings produced due to the traffic congestion relief provided by the Preferred Alternative. The Preferred Alternative would result in 18,000 to 21,000 hours of travel time savings per day.

These travel time savings translate into economic benefits in terms of the value of time saved and increased economic activity from improved mobility for people, goods, and services. Based on United

States Department of Transportation data, the value of time savings could range between $20 and $30 per vehicle hour (USDOT, Departmental Guidance for the Valuation of Travel Time in Economic Analysis, April 9, 1997; revised February 11, 2003). The type and level of economic benefits from improved mobility would also be influenced by other factors such as local, regional, and national market and economic conditions, local land use policies and regulations, availability of necessary infrastructure and services, community amenities and quality of life, and decisions by local developers and landowners. Thus, while there is support for a conclusion that there are positive economic impacts from time savings, the value of these benefits has not been quantified because of the variety of factors and the assumptions required for such quantification.

**Title VI of the Civil Rights Act of 1964.** Title VI of the Civil Rights Act of 1964 (42 U.S.C. Section 2000d et seq.) prohibits "...exclusion from participation in, denial of benefits of, and discrimination under Federally assisted programs on [the] ground of race, color, or national origin." This statute applies to every program area in the FHWA. It is FHWA's longstanding policy to actively ensure nondiscrimination in federally funded activities. Furthermore, it is FHWA's continuing policy to identify and prevent discriminatory effects by actively administering its programs, policies, and activities to ensure that social impacts to communities and people are recognized early and continually throughout the transportation decision-making process from early planning through implementation.

FHWA managers and staff administer their programs in a manner to ensure that no person is excluded from participating in, denied the benefits of, or subjected to discrimination under any program or activity of FHWA because of race, color, or national origin. One of the ways in which FHWA complies with Title VI is through compliance with EO 12898, DOT Order 5610.2, and FHWA Order 6640.23 (December 1, 1998), which are primarily a reaffirmation of the principles of Title VI of the Civil Rights Act of 1964 (Title VI) and related statutes, the National Environmental Policy Act (NEPA), 23 U.S.C. Section 23 109(h), and other Federal environmental laws, emphasizing the incorporation of those provisions with the environmental and transportation decision-making process.

FHWA implements the principles of these orders by incorporating Environmental Justice principles in all FHWA programs, policies, and activities within the framework of existing laws, regulations, and guidance. The Environmental Justice section of this Final EIS/Final Section 4(f) Evaluation reflects the FHWA-required analysis to address these orders in a National Environmental Policy Act (NEPA) environmental document.

The July 26, 2000, Caltrans Title VI Policy Statement ensures compliance with 42 U.S.C. Section 2000d that no "...person in the United States shall, on the ground of race, color or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

## Environmental Justice

Executive Order 12898, known as the Environmental Justice Policy, requires federal agencies to achieve environmental justice by addressing disproportionately high adverse human health and environmental effects, including interrelated social and economic effects of their programs, policies, and activities on minority and low-income populations in the United States. FHWA guidelines

(FHWA Order 6640.23, December 2, 1998) define low-income populations as a household with income at or below the Department of Health and Human Services poverty guidelines, and minority population as persons who are:

- Black: having origins in any of the black racial groups of Africa
- Hispanic: of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race
- Asian American: having origins in any of the original peoples of the Far East, southeast Asia, the Indian subcontinent, or the Pacific Islands
- American Indian and Alaskan Native: having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition

An adverse impact is found to have a disproportionately high and adverse impact on low-income or minority populations when:

- The adverse impact is predominantly borne by a minority population and/or a low-income population.
- The adverse impact that will be suffered by the minority population and/or low-income population is more severe or of greater magnitude than the adverse impact that will be suffered by the nonminority population and/or non-low-income population.

No SOCTIIP build Alternative, including the Preferred Alternative, would generate "...disproportionately high and adverse effects..." on low-income or minority populations because:

- The adverse displacement and relocation impacts are not borne predominantly by low-income or minority persons. Under all the SOCTIIP build Alternatives, more than 90 percent of the displaced populations are not poverty income persons, and more than 70 percent of the displaced persons are not minority.
- The adverse impacts of displacement and relocation are the same for low-income and non-low-income and minority and nonminority populations. All eligible displaced households would obtain relocation assistance.
- Therefore, no SOCTIIP build Alternative would result in adverse environmental justice impacts related to displacement and relocation.
- Other impacts such as noise, air quality, etc., will generally affect populations in the corridors as a whole, rather than in the localized fashion caused by right-of-way requirements. For these cases, the potential for disproportionate representation by environmental justice populations was evaluated for the corridors as a whole. This analysis is based on minority and poverty income data from Census Tracts through which the corridor alignments pass from the 2000 United States Census. The representation of minority and below poverty level income populations in the corridors is similar to the study area as a whole. Therefore, low-income and minority populations would not disproportionately bear any adverse impacts from air quality, noise, traffic, or other issues that would affect corridor populations as a whole.

## Long-Term Impacts Related to Socioeconomics and Environmental Justice

**Residential, Nonresidential, and Agricultural Displacements.** The long-term impacts related to residential, nonresidential, and agricultural displacements with the Preferred Alternative would be the same as the short-term adverse impacts of the Preferred Alternative. There are no residential, nonresidential, or agricultural displacements.

**Community Cohesion.** The long-term impacts related to community cohesion under the Preferred Alternative would be the same as the short-term impact discussed for the Preferred Alternative. There are no impacts to community cohesion.

**Economic Impacts.** The long-term impacts related to economics under the Preferred Alternative would be the same as the short-term impact identified for the Preferred Alternative.

**Title VI.** With implementation of the principles outlined in FHWA and Caltrans policies and orders related to Title VI and due to the lack of a disproportionately high and adverse effect on any low-income or minority population in the project study area, there would be no long-term impacts related to Title VI under the Preferred Alternative.

**Environmental Justice.** There would be no long-term impacts related to Environmental Justice under the Preferred Alternative.

## Impacts in Coastal Zone

**Residential, Nonresidential, and Agricultural Displacements.** The Preferred Alternative would not result in the displacement of any residences or residents, nonresidential uses, or agricultural uses in the Coastal Zone.

**Business, Institutional, and Nonprofit Displacement.** The Preferred Alternative would not result in the displacement of any business, institutional, or nonprofit displacements in the Coastal Zone.

**Agricultural Displacements.** There are no active agricultural areas in the Coastal Zone. The Preferred Alternative would not displace any agricultural uses within the Coastal Zone.

**Replacement Resources.** As the Preferred Alternative would not result in the displacement of any residences or residents in the Coastal Zone, similarly, the Preferred Alternative would not result in impacts related to replacement resources in the Coastal Zone.

**Community Cohesion.** The Preferred Alternative would not directly impact any MCB Camp Pendleton housing and would divide any existing neighborhoods in the Coastal Zone.

**Economic Impacts.** As stated above, the Preferred Alternative will impact local property tax revenues. In general, the impact is minor, at less than 1 percent of the total local property tax revenues, and should not adversely affect the local jurisdictions' revenue bases. The Preferred Alternative in the Coastal Zone is located on MCB Camp Pendleton, which is not a direct source of local tax revenue. Therefore, the Preferred Alternative would not result in any impacts related to sales tax revenues or impacts related to TOT revenues in the Coastal Zone.

**Loss of Employment Opportunities.** The Preferred Alternative would not result in any impacts related to lost employment opportunities in the Coastal Zone.

**Capacity and Lifespan of Prima Deshecha Landfill.** The Prima Deshecha Landfill is not located in the Coastal Zone. The Preferred Alternative would not result in any impacts to the Prima Deshecha Landfill.

**Established Business Districts.** The Preferred Alternative in the Coastal Zone is located on MCB Camp Pendleton. Therefore, it would not result in direct impacts to any business districts in the Coastal Zone. Inasmuch as the FTC-S will improve mobility in and access to the City of San Clemente, it may have a beneficial impact to businesses in the downtown business district, which is located in the Coastal Zone.

**Travel Time Saving from Congestion Relief.** The amount of travel time savings from congestion relief resulting from the Preferred Alternative to residences located in the Coastal Zone and the SOCTIIP study area is unknown. However, the Preferred Alternative is estimated to result in between 18,000 to 21,000 hours of travel time savings per day for the study area.

**Environmental Justice.** The Preferred Alternative will not result in adverse impacts that are predominantly borne by a minority population and/or low-income population. There are no residential displacements as a result of the project, including in the Coastal Zone. Therefore, there are no adverse environmental justice impacts in the Coastal Zone.

## 2.3.4 MITIGATION

The following mitigation measures were developed to avoid or minimize as much as possible the impacts of the Preferred Alternative related to socioeconomics, and are included in the Mitigation Monitoring and Reporting Program included as Appendix A of this document. These measures were developed to address a range of potential impacts associated with some or all of the 38 alternatives evaluated in the Draft EIS/SEIR.

**SE-1** **Avoidance of the Temporary Use and/or Permanent Acquisition of Residential and Nonresidential Property.** During final design, the TCA or the implementing agency/ agencies will refine the design to the extent feasible based on engineering judgment and design standards to avoid or minimize the permanent acquisition of land currently occupied by residential and nonresidential users. In the event that the temporary use or permanent acquisition of this property cannot be avoided through design refinements, other mitigation measures identified for the compensation of temporary and permanent use of residential and nonresidential property will apply to the build Alternatives.

**SE-2** **Property Acquisition and Relocation Assistance.** Prior to acquisition of right-of-way, the TCA or other agencies implementing a SOCTIIP Alternative (because the TCA will not be the implementing agency for the non-corridor Alternatives) will comply with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 in the acquisition of all property within the right-of-way necessary for the proposed project. All displaced households and businesses will be contacted to ensure that each eligible displacee receives full relocation benefits, including advisory assistance, and that all activities will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources will be available to all eligible displaced persons or businesses without discrimination. TCA will also comply with the Public Park Preservation Act as applicable.

*Note: There are no displaced persons, households, or businesses as a result of the Preferred Alternative.*

**SE-3** **Replacement Housing Program.** Prior to demolition of any affordable units, the TCA or other implementing agency/agencies shall enter into an agreement with the City of San Clemente to provide replacement affordable housing in compliance with the requirements of the City of San Clemente Housing Element. This shall be accomplished through the provision of replacement housing or the payment of in-lieu fees. No other jurisdictions in the displacement area have similar programs. The City of San Clemente's Housing Element requires that three or more dwelling units in the Coastal Zone which are to be demolished or converted, and which are currently occupied by households whose income is 80 percent or below the County median income, be replaced.

*Note: There is no demolition of affordable housing units as a result of the Preferred Alternative.*

## 2.3.5 CONCLUSION

Impacts of the Preferred Alternative, including the Preferred Alternative in the Coastal Zone related to socioeconomics and environmental justice would be less than significant.

# 2.4 NOISE

## 2.4.1 INTRODUCTION

Noise concerns associated with the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) include short-term and long-term impacts resulting from the construction and operation of the Preferred Alternative. The Noise Assessment Technical Report (Mestre Greve Associates 2003) and the Supplemental Noise Assessment (Mestre Greve Associates 2004) were reviewed to determine the potential impacts related to noise in the SOCTIIP study area. Potential noise effects are addressed in Section 4.6 of the Final SEIR.

## 2.4.2 SETTING

### Study Area Setting

**Noise Assessment Metrics.** The description, analysis, and reporting of community noise levels around communities is made difficult by the complexity of human response to noise and the variety of noise metrics developed for describing noise impacts. Each metric attempts to quantify noise levels with respect to community response. Most metrics use the A-weighted decibel (dBA) noise level to quantify noise impacts on humans. A-weighting is a frequency weighting that accounts for human sensitivity to different frequencies.

Noise metrics can be divided into two categories: single-event and cumulative. Single-event metrics describe the noise levels from an individual event such as an aircraft flyover or a heavy equipment pass-by. Cumulative metrics average the total noise over a specific time period, which is typically 1 hour, or 24 hours for community noise. For the analysis of noise impacts under the Preferred Alternative, cumulative noise metrics were used.

Two predominant noise scales are the Equivalent Noise Level ($L_{eq}$) and the Community Noise Equivalent Level (CNEL). Day-Night Noise Level (LDN) and L(%) are also used in community noise assessment. These metrics are described below:

- $L_{eq}$ is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. $L_{eq}$ is the "energy" average noise level during the time period of the sample. $L_{eq}$ can be measured for any time period, but is typically measured for 1 hour. This 1-hour noise level can also be referred to as the Hourly Noise Level (HNL). It is the energy sum of all the events and background noise levels that occur during that time period.
- CNEL is the predominant rating scale now in use in California for land use/noise compatibility assessments. The CNEL scale represents a time-weighted, 24-hour average noise level based on the A-weighted decibel. Time-weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized for occurring at these times. The evening time period (7:00 p.m.–10:00 p.m.) penalizes noises by 5 dBA, while nighttime (10:00 p.m.–7:00 a.m.) noises are

penalized by 10 dBA. These time periods and penalties were selected to reflect people's increased sensitivity to noise during these time periods. A CNEL noise level may be reported as a CNEL of 60 dBA, 60 dBA CNEL, or simply 60 CNEL.

- LDN, the day-night scale, is similar to the CNEL scale except that evening noises are not penalized. It is a measure of the overall noise experienced during an entire day. Time-weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized for occurring at these times. In the LDN scale, those noise levels that occur during the night (10:00 p.m.–7:00 a.m.) are penalized by 10 dB. This penalty attempts to account for increased human sensitivity to noise during this quieter period of a day, where sleep is the most probable activity.
- L(%) is a statistical method of describing noise that accounts for variance in noise levels throughout a given measurement period. L(%) is a way of expressing the noise level exceeded for a percentage of time in a given measurement period. For example, because five minutes is 25 percent of 20 minutes, L(25) is the noise level that is equal to or exceeded for five minutes in a 20-minute measurement period. L(%) is used for most noise ordinance standards. For example, most daytime city, State, and county noise ordinances use an ordinance standard of 55 dBA for 30 minutes per hour, or an L(50) level of 55 dBA. In other words, the noise ordinance states that no noise level should exceed 55 dBA for more than 50 percent of a given period.

**Noise Criteria for Construction Noise.** Short-term noise levels from construction activities are measured against the applicable local municipality's Noise Ordinance to assess whether there are any short-term noise impacts. Construction activities complying with the applicable local Noise Ordinance are considered to result in no adverse short-term noise impacts. Construction activities that result in short-term noise levels that exceed the applicable local Noise Ordinance are considered adverse.

The Preferred Alternative passes through unincorporated Orange County, the City of San Clemente, and unincorporated San Diego County. The only receptors in unincorporated San Diego County are in Camp Pendleton and San Onofre State Beach. The San Diego County Municipal Code is not applicable to Camp Pendleton and does not contain standards applicable to campgrounds.

The Orange County Noise Ordinance was used to assess noise impacts from construction on uses in unincorporated areas as well as San Juan Capistrano, which has Noise Ordinances that do not apply directly to this project. The Orange County Noise Ordinance was also used to assess construction noise impacts for Camp Pendleton. Table 2.4-1 presents Orange County's Noise Ordinance standards. The City of San Clemente Noise Ordinance was used to assess construction noise impacts for uses within the City of San Clemente.

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) require potential noise impacts from construction activities to be assessed but do not provide any criteria for determination of impacts. Where the local municipality has a noise ordinance, it is typically used as the criteria for construction noise. The applicable noise ordinances are discussed in detail in the Noise Assessment Technical Report (Mestre Greve Associates 2003).

## Table 2.4-1: Orange County Noise Ordinance Standards

| Maximum Time of Exposure | Noise Metric | Noise Level not to be Exceeded Residential Zone 7:00 AM to 10:00 PM (daytime) | 10:00 PM to 7:00 AM (nighttime) |
|---|---|---|---|
| **Exterior Noise Standards** | | | |
| 30 Minutes/Hour | $L_{50}$ | 55 dBA | 50 dBA |
| 15 Minutes/Hour | $L_{25}$ | 60 dBA | 55 dBA |
| 5 Minutes/Hour | $L_{8.3}$ | 65 dBA | 60 dBA |
| 1 Minute/Hour | $L_{1.7}$ | 70 dBA | 65 dBA |
| Any period of time | $L_{max}$ | 75 dBA | 70 dBA |
| **Interior Noise Standards** | | | |
| 5 Minutes/Hour | $L_{8.3}$ | 55 dBA | 45 dBA |
| 1 Minute/Hour | $L_{1.7}$ | 60 dBA | 50 dBA |
| Any period of time | $L_{max}$ | 65 dBA | 55 dBA |

Source: County of Orange Land Use/Noise Compatibility Manual, September 18, 1984, and amended December 14, 1993.

### Criteria Related to Operation Noise.

**Caltrans/FHWA $L_{eq}$(h) Criteria.** FHWA has adopted noise abatement criteria (NAC) for highway construction projects as published in the "Federal Aid Highway Program Manual of Federal Highway Administration," Volume 7, Chapter 7, Section 2, entitled "Procedures for Abatement of Highway Traffic Noise and Construction Noise" (September 18, 1982). The standards are also codified in the Code of Federal Regulations (23 CFR 772). The following noise standards are taken from the FHWA PPM 772 (also 23 CFR 773):

> "NOISE STANDARDS. The highway traffic noise prediction requirements, noise analyses, noise abatement criteria, and requirements for informing local officials in this regulation constitute the noise standards mandated by 23 U.S.C. 109(i). All highway projects which are developed in conformance with this regulation shall be deemed to be in conformance with the Federal Highway Administration (FHWA) noise standards"

The NAC specified by the FHWA have been adopted by Caltrans. Caltrans NAC are contained in its "Traffic Noise Analysis Protocol For New Highway Construction and Reconstruction Projects" (October 1998) and are presented in Table 2.4-2. The NAC apply to various land uses, as indicated in Table 2.4-2. For interior areas, the criteria assume that typical wood-frame homes provide 10 dBA noise reduction (outdoor to indoor) with windows open and 20 dBA reduction with windows closed.

## Table 2.4-2: FHWA/Caltrans Noise Abatement Criteria

| Activity Category | NAC, Hourly A-Weighted Noise Level, dBA $L_{eq}(h)$ | Description of Activities |
|---|---|---|
| A | 57 Exterior | Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. |
| B | 67 Exterior | Picnic areas, recreation areas, playgrounds active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals |
| C | 72 Exterior | Developed lands; properties or activities not included in Categories A or B above. |
| D | -- | Undeveloped lands |
| E | 52 Interior | Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums. |

Source: Caltrans Traffic Noise Analysis Protocol (October, 1998).

The FHWA/Caltrans NAC are only applicable to areas along new roads constructed by a project or existing roads that would be modified by a project (i.e., addition of lanes). The NAC are not assessed along existing roadways that would not be physically altered by the project. In terms of the FHWA/Caltrans NAC, when the predicted future with project noise levels approach or exceed the NAC for uses along new roads constructed by the project or existing roads that would be modified by the project (i.e., addition of lanes), noise abatement measures (e.g., construction of a noise barrier) must be considered.

The NAC are in terms of the worst hourly $L_{eq}$ traffic noise impact on a regular basis for the design year. Approaching the NAC is considered to be a noise level within 1 dB of the NAC. For residential areas, the NAC is 67 dBA $L_{eq}(h)$. Noise levels of 66 dBA in these areas $L_{eq}(h)$ are considered approaching the NAC.

Even if the predicted noise level does not approach or exceed the NAC, traffic noise impacts can occur when the with project noise levels substantially exceed the existing noise levels. Caltrans has established a substantial increase to be a 12 dBA increase in the peak-hour $L_{eq}$ noise level.

**Local Municipality CNEL Criteria.** The operational noise standards for local municipalities are defined in the Noise Elements of their General Plans. The County of Orange and all the municipalities in the study area have established an exterior residential CNEL noise standard of 65 CNEL. The County has not established an applicable noise standard relating to parks. However, all the cities in the project area have established a 65 CNEL noise standard for parks. In some cities, this standard is only applicable at picnic areas; in others it is applicable at picnic areas, playgrounds, and areas of frequent human activity. For this analysis, the broader scope of the standard was applied and noise levels at potentially impacted park picnic areas, playgrounds, and areas of frequent human activity were evaluated.

**Noise-Sensitive Receptors.** Table 2.4-3 presents a numbered list of the representative noise-sensitive receptors that were assessed for this analysis and the land use that each receptor represents. Noise-sensitive land uses that may be impacted by the Preferred Alternative include residential areas, schools, and parks, including campground and recreation uses. Parking lots are not considered noise-sensitive. The locations of these receptors are shown in Figure 2.4-1.

### Table 2.4-3: Noise Receptors Assessed

| Receptor ID | Description | Land Use |
|---|---|---|
| 001 | MCB Camp Pendleton beach club/campground | Campground |
| 002 | MCB Camp Pendleton San Onofre Mobile Home Park | Residential |
| 003 | MCB Camp Pendleton San Onofre Child Development Center | School |
| 004 | MCB Camp Pendleton San Onofre I residence | Residential |
| 005 | MCB Camp Pendleton San Onofre II residence | Residential |
| 007 | MCB Camp Pendleton San Mateo Point | Residential |
| 009 | San Mateo campground, space 143 | Campground |
| 012 | Royal Lytham #2 Tee, Pacific Golf Club | Park |
| 013 | MCB Camp Pendleton Camp Talega | Residential |
| 018 | 150 Avenida Cota | Residential |
| 019 | 331-353 Avenida Adobe | Residential |
| 020 | end of Via Cisco | Residential |
| 021 | end of Via Promontorio | Residential |
| 022 | 424 Bolivia | Residential |
| 023 | Richard Steed Park Ballfield | Park |
| 059 | Vista Point, Riley Wilderness Park | Park |
| 062 | Tesoro High School, NE corner | School |
| 063 | 302 Corte Mira Vista | Residential |
| 070 | New Talega Development | Residential |

Source: Mestre Greve Associates (2003).

These receptors were chosen to best represent the representative worst-case conditions for all the noise-sensitive uses in the vicinities of the Preferred Alternative. That is, the residential or other sensitive use is close to and/or has a high exposure to the alignment of a Preferred Alternative.

Most of the receptors are along I-5 and are potentially impacted by the widening of I-5. This is because most of the existing noise-sensitive land uses that may be impacted by the Preferred Alternative are along I-5. Most of the noise-sensitive receptors that may be impacted by the Preferred Alternative are in and near the southern ends of these Alternatives, in more developed areas.

LSA

FIGURE 2.4-1

County Boundary

Coastal Zone Boundary

San Onofre State Park leasehold subunits*

Preferred Alternative (11/26/06)

Noise Analysis Receptor Locations

Proposed Sound Walls

SOURCE: EagleAerial (4/2006); CDMG (11/29/06); CCC (2005); Mestre Greve Associates (12/03) * Boundaries are considered as estimates

I:\TCA430\GIS\CZ_NoiseReceptors.mxd (2/12/07)

*Foothill Transportation Corridor – South*

Noise Receptors and Soundwalls within the Coastal Zone

Schools are an especially sensitive receptor site due to the young age of the students and the high level of activity that can occur on the playfields. Tesoro High School is within 0.4 kilometer (km) (0.25 mile [mi]) of the centerlines of the Preferred Alternatives.

**Measured Existing Noise Levels.** Measurements of ambient noise levels were conducted at the 19 receptors listed in Table 2.4-3. These measurements document the existing background noise levels in the areas surrounding the Preferred Alternative.

The results of the noise measurements are presented in Table 2.4-4. The receptor identification number (ID), description, and existing land use are presented in the first three columns, respectively. The next two sets of two columns present the date and $L_{eq}$ noise levels of each measurement at the receptor.

**Table 2.4-4: Noise Measurement Results**

| ID | Description | Land Use | Date | $L_{eq}$ (dBA) | Date | $L_{eq}$ (dBA) |
|---|---|---|---|---|---|---|
| 001 | MCB Camp Pendleton beach club/campground | Campground | 14-Aug-01 | 58 | 14-Aug-01 | 60 |
| 003 | MCB Camp Pendleton San Onofre Child Development Center | School | 14-Aug-01 | 62 | 14-Aug-01 | 63 |
| 004 | MCB Camp Pendleton San Onofre I residence | Residential | 14-Aug-01 | 58 | 14-Aug-01 | 59 |
| 007 | MCB Camp Pendleton San Mateo Point | Residential | 14-Aug-01 | 61 | 14-Aug-01 | 62 |
| 009 | San Mateo campground, space #143 | Campground | 13-Jul-01 | 47 | 17-Jul-01 | 47 |
| 012 | Royal Lytham #2 Tee, Pacific Golf Club | Park | 17-May-01 | 50 | 17-May-01 | 45 |
| 013 | MCB Camp Pendleton Camp Talega | Campground | 14-Aug-01 | 58 | 14-Aug-01 | 53 |
| 018 | 150 Avenida Cota | Residential | 15-May-01 | 48 | 15-May-01 | 49 |
| 019 | 331-353 Avenida Adobe | Residential | 15-May-01 | 54 | 15-May-01 | 52 |
| 020 | end of Via Cisco | Residential | 15-May-01 | 47 | 15-May-01 | 59 |
| 021 | end of Via Promontorio | Residential | 15-May-01 | 39 | 15-May-01 | 47 |
| 022 | 424 Bolivia | Residential | 15-May-01 | 43 | 17-May-01 | 47 |
| 023 | Richard Steed Park ballfield | Park | 15-May-01 | 43 | 17-May-01 | 47 |
| 059 | Vista Point, Riley Wilderness Park | Park | 22-May-01 | 44 | 30-May-01 | 42 |
| 061 | 434 Camino Bandera | Residential | 14-May-01 | 45 | 31-May-01 | 47 |
| 062 | Tesoro High School, NE corner | School | 15-May-01 | 43 | 8-Jun-01 | 43 |
| 063 | 302 Corte Mira Vista | Residential | 31-May-01 | 51 | 1-Jul-01 | 50 |
| 064 | Ave. Vista Hermosa @ Calle Saluda | Residential | 31-May-01 | 43 | 31-May-01 | 45 |

Source: Mestre Greve Associates (2003).

For the sites along I-5, the two $L_{eq}$ noise level measurements agreed to ±2 dB. That is, the measured noise levels were recorded and found to be generally within 2 dB of that predicted by the noise model. The consistency of these measurements was analyzed as required by the Caltrans Protocol.

For details regarding noise level measurements and noise model calibration, refer to the Noise Assessment Technical Report (Mestre Greve Associates 2003).

Noise levels near I-5 were relatively high and were reduced as distance from the freeway was increased. Noise levels in areas away from roads and development were relatively low. Military helicopter operations were substantially louder than the background ambient levels in areas away from roads and development.

**Modeled Existing Noise Levels.** Caltrans traffic noise model $L_{eq}V2$ was used to model existing peak hour traffic noise levels at the receptors along I-5. The measured noise levels presented above were not taken during periods where traffic conditions would result in the peak noise hour. For more information on the traffic conditions used to model the peak noise hour, refer to the Noise Assessment Technical Report (Mestre Greve Associates 2003).

The noise measurements along I-5 were used to calibrate the noise model. The noise model was developed for the same traffic conditions that existed as during the noise measurements at each site. The model was adjusted to minimize the difference.

**Existing Peak Hour Noise Level Modeling Results.** Along highways with congestion, the noisiest hour does not correspond with the hour of the highest traffic volume. During the hour with the highest traffic volume, congestion results in lower speeds, which result in lower noise levels than other hours where traffic is free-flowing. The hour that results in the highest noise levels is the hour where the traffic volume is the greatest and still remains at free flow. Because the measurements were not necessarily taken during periods with these conditions, and noise measurements were not performed for all receptors, existing peak noise hour levels were modeled. The primary noise contributor is related to tire speed and free-flow conditions. Specific noise measurements during this time frame would be very difficult to predict. This specific data are difficult to attain, but are not required to determine the severity of impact and whether to propose mitigation since that information may be derived from the noise model. Table 2.4-5 presents the results of this modeling for each of the receptors along I-5. Table 2.4-5 also shows the NAC activity categories and the NAC for each receptor. Noise levels approaching or exceeding the NAC are shown in bold italics. Table 2.4-5 shows that for two of the six receptors, the existing peak noise hour traffic noise levels currently approach the NAC.

## Coastal Zone Setting

Table 2.4-6 presents a numbered list of the representative noise sensitive receptors within the Coastal Zone. Noise sensitive land uses in the Coastal Zone that may be impacted by the Preferred Alternative include residential areas, schools, and parks including campground and recreation uses. As mentioned previously, parking lots are not considered noise sensitive. Existing peak noise levels for the Coastal Zone are the same as those presented in Table 2.4-5.

### Table 2.4-5: Existing Peak Noise Hour Traffic Noise Levels

| Receptor ID | Description | Existing $L_{eq}(H)$ dBA | Activity Category[1] | NAC |
|---|---|---|---|---|
| 001 | MCB Camp Pendleton beach club/campground | 65 | B | 67 |
| 002 | MCB Camp Pendleton San Onofre MHP | 60 | B | 67 |
| 003 | MCB Camp Pendleton San Onofre Child Development Center | ***66*** | B | 67 |
| 004 | MCB Camp Pendleton San Onofre I residence | 61 | B | 67 |
| 005 | MCB Camp Pendleton San Onofre II residence | 59 | B | 67 |
| 007 | MCB Camp Pendleton San Mateo Point | ***66*** | B | 67 |

Source: Mestre Greve Associates (2003).
[1] Per FHWA noise criteria See Table 2.4-2.
***Bold Italic*** values indicate noise levels that approach or exceed the NAC.

### Table 2.4-6: Noise Receptors within the Coastal Zone

| Receptor ID | Description | Land Use |
|---|---|---|
| 001 | MCB Camp Pendleton beach club/campground | Campground |
| 002 | MCB Camp Pendleton San Onofre Mobile Home Park | Residential |
| 003 | MCB Camp Pendleton San Onofre Child Development Center | School |
| 004 | MCB Camp Pendleton San Onofre I residence | Residential |
| 005 | MCB Camp Pendleton San Onofre II residence | Residential |
| 007 | MCB Camp Pendleton San Mateo Point | Residential |
| 009[1] | San Mateo campground, space #143 | Campground |

Source: Mestre Greve Associates (2003).
[1] San Mateo Campground is near, but not within, the Coastal Zone

## Updated Information

No additional information or reports pertaining to noise have been submitted to the FHWA or the Transportation Corridor Agencies (TCA) since certification of the EIR. The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements being required by the Marine Corps. The new gate area facility will include six sentry houses, a 510-square-foot gatehouse, a truck inspection area with canopy, a watch tower, control gates, and a parking area. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.4.3 IMPACTS

### Methodology

SOUND32 with the SOUND2000 front end was used for noise modeling noise levels along the corridor Alternatives. Caltrans $L_{eq}$V2 was used for modeling noise levels along I-5. Both models are based on the methodology presented in FHWA-RD-77-108 and approved for use by FHWA. For more information on the methodology, please refer to the Final SEIR and the Noise Assessment Technical Report (Mestre Greve Associates 2003), and the Supplemental Noise Assessment (Mestre Greve Associates 2004).

### Project Impacts

**Construction Impacts Related to Noise.** Noise levels from construction activities are measured against the applicable local municipality's noise ordinance to assess whether there are any short-term noise impacts. Construction activities complying with the applicable local Noise Ordinance are considered to result in no adverse short-term noise impacts. Construction activities that result in short-term noise levels exceeding the applicable local noise ordinance are considered adverse.

Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers, and portable generators can reach high levels and be intrusive to surrounding areas. The following discussion identifies the potential noise levels that could occur during various phases of construction and the durations of these construction activities. The projected noise levels are then contrasted with accepted noise levels for residential, school, and other noise-sensitive land uses.

Construction noise activities can be divided into the following five broad categories based on their potential to generate noise:

- Pile driving
- Heavy grading
- General construction activities
- Nighttime demolition
- Haul routes

Generally, construction will occur only during daytime hours. However, major bridge construction may occur on a 24-hour basis.

**Construction Noise Associated with Pile Driving.** Pile-driving operations are responsible for very high peak or impact noise levels during construction. The EPA ("Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," December 31, 1971) reports that pile-driving operations can result in peak noise levels of 90 to 105 dBA at 15 m (50 ft), with 100 dBA being typical. Table 2.4-7 presents distances to peak noise levels for pile-driving operations. The loud bangs from pile driving can occur every few seconds. Based on experience with construction of the San Joaquin Hills Transportation Corridor (telephone conversation with Sam Sims, TCA, January 2003), pile driving usually lasts about 1 to 1.5 weeks per pier or abutment. For most bridges,

including wildlife crossings, there are two abutments and two piers. Therefore, pile driving for a typical bridge can last roughly 4 to 6 weeks.

**Table 2.4-7: Distances for Peak Noise Levels for Pile Driving Operations**

| Level at 15 m (50 ft) | 65 dBA | 70 dBA | 75 dBA | 80 dBA |
|---|---|---|---|---|
| 100 dBA | 850 m | 500 m | 250 m | 150 m |
| | (2,800 ft) | (1,600 ft) | (900 ft) | (500 ft) |

Source: Mestre Greve Associates (2003).

The pile driving for flyovers can require a longer construction period. Flyovers for the Preferred Alternatives would occur where the corridor joins I-5 with direct connectors.

There may be a potential need to conduct nighttime pile driving during construction. Nighttime pile driving will only be allowed on review of the construction plans for the Preferred Alternative by the implementing agency to confirm that appropriate noise attenuation measures are in place, including appropriate notification of the public.

Based on a pile-driving noise level of 100 dBA at 15 m (50 ft), noise levels at other distances can be forecast. At a distance of 150 m (500 ft), the pile-driving noise might still be as high as 80 dBA. This noise level will decrease as the distance from the source increases.

The Orange County Noise Ordinance does not limit daytime noise on weekdays for construction activities. For nighttime hours, construction noise is limited to a peak noise of 70 dBA. Peak or impulsive (or noncontinuous) (i.e., instantaneous) noise levels are penalized by 5 dBA, effectively making the critical criterion 65 dBA. Noise levels above this limit that are not controlled in a manner consistent with the Noise Ordinance would be considered intrusive. At 850 m (2,800 ft), the maximum noise associated with pile driving is projected to be 65 dBA. Therefore, pile driving during construction of the corridor Alternatives could not occur within 850 m (2,800 ft) of residences during the nighttime hours or during weekend periods without exceeding the County Noise Ordinance.

Similarly, the San Clemente Noise Ordinance allows construction noise levels up to 70 dBA measured at the nearest residential property line during weekday daytime hours (7:00 a.m. to 6:00 p.m.). Pile driving anywhere in San Clemente closer than 500 m (1,600 ft) of residential areas would probably be in violation of the San Clemente Noise Ordinance, even it occurs during the weekday during daytime hours. Additionally, the Ordinance (Section 8.48.030 [o]) specifically prohibits pile driving in San Clemente on any day between the hours of 6:00 p.m. and 7:00 a.m. Therefore, the ability to operate pile drivers within the San Clemente city limits will be severely limited. A variance may be requested from the City, but there is no requirement that the City grant such a variance.

**Construction Noise Associated with Heavy Grading.** After clearing vegetation and other preparatory work, an area will be ready for heavy grading that results in the grading of the site into roughly its final form. Large scrapers such as the Caterpillar 623 and Caterpillar 657 are used during heavy grading. Although pile driving can result in the highest peak noise levels, heavy grading can result in the highest average noise levels due to the constant noise generated by graders over extended periods of time.

Heavy grading operations will occur for approximately two years. However, this does not mean that at any one location there will be heavy grading for this entire period. For a typical location near the corridor, there would be 15 to 30 graders working for approximately two to three months.

Based on approximately 30 scrapers working near a noise-sensitive area, the average noise levels at various distances were calculated and are presented in Table 2.4-8. Noise levels greater than 70 dBA will be experienced at distances less than 170 m (550 ft) from the grading equipment. Noise levels of 55 dBA may be heard at distances greater than 0.85 km (0.5 mi). These estimates do not consider the effects of topography or intervening structures.

**Table 2.4-8: Distances for Various Average Noise Levels ($L_{50}$%) for Heavy Grading Operations**

| Level at 15 m (50 ft) | 50 dBA | 55 dBA | 60 dBA | 65 dBA |
|---|---|---|---|---|
| 90 dBA | 1500 m | 900 m | 500 m | 300 m |
| | (5,000 ft) | (2,800 ft) | (1,600 ft) | (1,000 ft) |

The County of Orange does not limit construction noise during the weekday daytime hours. The Orange County Noise Ordinance limits average noise levels (i.e., L50% levels) to 50 dBA during nighttime and weekend for all activities, including construction. Noise levels above this limit that are not controlled in a manner consistent with the Noise Ordinance would be considered intrusive. Residences within 1,500 m (5,000 ft) would be impacted by heavy grading operations if they occur at night or during the weekend as defined in the Orange County Noise Ordinance.

For heavy grading in San Clemente, the City's Noise Ordinance would limit the maximum noise level to 70 dBA between 7:00 a.m. and 6:00 p.m. on weekdays and Saturdays. Construction occurring outside these hours and on Sunday and holidays would be prohibited. Construction occurring within 150 m (500 ft) of residences would likely exceed 70 dBA, be an impact, and would require a variance from the City.

**Construction Noise Related to General Construction Activities.** General construction activities result in substantially lower noise levels than pile driving or heavy grading. During general construction, many different types of equipment may be operating, including dozers, loaders, various kinds of trucks, pavers, cranes, etc. An estimate of general construction noise levels is presented in Table 2.4-9. The noise level is provided for various distances. The estimates are based on a typical situation and could vary either up or down by more than 10 dBA.

**Table 2.4-9: Distances for Various Average Noise Levels ($L_{50}$%) for General Construction**

| Level at 15 m (50 ft) | 50 dBA | 55 dBA | 60 dBA | 65 dBA |
|---|---|---|---|---|
| 75 dBA | 275 m | 150 m | 90 m | 50 m |
| | (900 ft) | (500 ft) | (300 ft) | (150 ft) |

Source: Mestre Greve Associates (2003).

The County of Orange does not limit construction noise during the weekday daytime hours. The Orange County Noise Ordinance limits average noise levels (i.e., L50% levels) to 50 dBA during nighttime and weekend for all activities, including construction. Noise levels above this limit that are not controlled in a manner consistent with the Noise Ordinance would be considered intrusive. Residences within 275 m (900 ft) would be impacted by general construction operations if they occur at night or during the weekend as defined in the Orange County Noise Ordinance.

For general construction activities in San Clemente, the City's Noise Ordinance would limit the maximum noise level to 70 dBA between 7:00 a.m. and 6:00 p.m. on weekdays and Saturdays. Construction occurring outside these hours and on Sunday and holidays would be prohibited. Construction occurring within 27 m (90 ft) of residences would likely exceed 70 dBA, be an adverse impact, and would require a variance from the City.

**Construction Noise Related to Nighttime Demolition.** Nighttime demolition would not occur under the Preferred Alternative. Therefore, there are no anticipated impacts related to nighttime demolition.

**Construction Noise Related to Haul Routes.** Soil may need to be hauled onto or from the project site. At this time, the number of haul trucks and the truck haul routes are not known. Generally, the more haul trucks on a road, the higher the potential for an adverse noise impact. A second factor would be the number of vehicles currently on the haul route. Haul trucks on a residential street that normally has 1,000 vehicles a day will have a greater impact than the same number of haul trucks on a major arterial roadway that normally has 40,000 vehicles per day. Other factors that affect the level of potential noise impact associated with hauling include the presence or absence of noise-sensitive land uses along the haul route and the presence or absence of noise barriers along the haul route.

**Specific Construction-Related Noise Impacts.** The discussion above identifies specific potential construction-related noise impacts for given construction situations. For example, if pile driving occurs during nighttime or weekend hours, as specified in the Orange County Noise Ordinance and occurs within 850 m (2,800 ft) of residential areas, then an impact occurs. If pile driving occurs at farther distances or only occurs during daytime hours, then no impact would occur. Similar situations occur for heavy grading and general construction. If heavy grading occurs within 1,500 m (5,000 ft), or general construction within 275 m (900 ft) of residential uses during weekend or nighttime hours, then impacts would occur. The Preferred Alternative is assumed to require the import or export of soil. No haul routes are identified at this time, so the Preferred Alternative has the potential to cause adverse noise impacts associated with hauling materials. Nighttime demolition within 850 m (2,800 ft) of residential uses would also result in an adverse noise impact.

Table 2.4-10 presents a summary of potential construction noise impacts. The potential for noise-related construction impacts is not refined at this time because detailed construction phasing and programs for the Preferred Alternative have not been fully developed. The evaluation of potential construction noise impacts includes all aspects of construction, including implementation of any necessary modifications to existing utilities.

**Table 2.4-10: Construction Noise Impact Summary**

| Construction in all Areas Except San Clemente | | | | |
|---|---|---|---|---|
| **Will Pile Driving Impacts Occur Within 850 m (2,800 ft)?** | **Will Heavy Grading Impacts Occur Within 1,500 m (5,000 ft)?** | **Will General Construction Impacts Occur Within 275 m (900 ft)?** | **Will Haul Route Use Have The Potential To Cause Impacts?** | **Will Nighttime Demolition Cause Noise Impacts?** |
| Night | Night[1] | Night | Possible | No |
| **Construction in San Clemente[2]** | | | | |
| No | No | No | Possible | No |

Source: Mestre Greve Associates (2003).
[1] It is extremely unlikely that heavy grading would be conducted at night. Therefore, although this is identified as a possible type of construction noise impact, heavy grading for the Preferred Alternative is not expected to occur at night.
[2] Construction between 6:00 p.m. and 7:00 a.m. or anytime on Sunday is prohibited in San Clemente.

**Long-Term Impacts Related to Noise.** The FHWA/Caltrans NAC criteria are only applicable to areas along new roads constructed by the Preferred Alternative or existing roads that will be modified by the Preferred Alternative (i.e., addition of lanes). In terms of the FHWA/Caltrans NAC, noise impacts occur when the predicted future noise levels approach or exceed the NAC for uses along new roads constructed or existing roads modified (i.e., addition of lanes) by the Preferred Alternative. The NAC are in terms of the worst hourly $L_{eq}$ traffic noise impact on a regular basis for the design year. The NAC were presented previously in Table 2.4-2. Approaching the NAC is considered as a noise level within 1 dB of the NAC. For residential areas, the NAC is 67 dBA $L_{eq}$(h). Noise levels of 66 dBA $L_{eq}$(h) in these areas are considered approaching the NAC.

Even if the predicted noise level does not approach or exceed the NAC, traffic noise impacts can occur when the with project noise levels substantially exceed the existing noise levels. Caltrans has established a substantial increase to be a 12 dBA increase in the peak-hour $L_{eq}$ noise level.[1]

In this section, long-term noise impacts resulting from the implementation of Preferred Alternative are assessed. Future traffic noise levels at receptors representing noise-sensitive land uses near the Preferred Alternative were projected through traffic noise modeling. These noise levels are compared to the FHWA/Caltrans NAC. For receptors where the future with project noise level approaches or exceeds the NAC or is 12 dB or more than the existing levels, noise abatement must be considered.

**Modeled Noise Levels for the SOCTIIP Alternatives.** Table 2.4-11 presents future with project noise levels at the receptors for the Preferred Alternative. For each receptor, the FHWA/Caltrans NAC and activity category are presented along with the existing noise level. The existing noise level is the existing peak noise hour noise level presented in Table 2.4-5 for receptors along I-5 or the measured existing noise level presented in Table 2.4-4 for all other receptors. The future with project noise level is presented along with the increase over existing conditions. Noise levels and increases

[1] Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, California Department of Transportation Environmental Program, October 1998.

where the noise level approaches or exceeds the NAC or exceeds the existing noise level by 12 dB or more are shown in **bold**.

### Table 2.4-11: Preferred Alternative Predicted Traffic Noise Impacts

| Receptor ID | Activity Category | NAC (dBA) | Existing (dBA) | Modeled Peak Hour Noise Level (dBA $L_{eq}[h]$) | Change Over Existing[1] (dBA) |
|---|---|---|---|---|---|
| 001 | B | 67 | 65 | **67** | **(2)** |
| 002 | B | 67 | 60 | 63 | (3) |
| 003 | B | 67 | 66 | **74** | **(8)** |
| 004 | B | 67 | 61 | 64 | (3) |
| 005 | B | 67 | 59 | 61 | (2) |
| 007 | B | 67 | 66 | **71** | **(5)** |
| 009 | B | 67 | 47 | **60** | **(13)** |
| 012 | B | 67 | 49 | 56 | (7) |
| 013 | B | 67 | 53 | 54 | (1) |
| 018 | B | 67 | 49 | 58 | (9) |
| 019 | B | 67 | 53 | 53 | (0) |
| 020 | B | 67 | 56 | 55 | (-1) |
| 021 | B | 67 | 44 | **57** | **(13)** |
| 022 | B | 67 | 45 | 40 | (-5) |
| 023 | B | 67 | 46 | 55 | (9) |
| 059 | B | 67 | 42 | 45 | (3) |
| 062 | B | 67 | 43 | **60** | **(17)** |
| 063a | B | 67 | 50 | **63** | **(13)** |
| 070c | B | 67 | 45 | 50 | (5) |

Source: Mestre Greve (2003).

[1] Numbers in parentheses show increase over existing conditions with Alternative. **Bold** numbers show traffic noise impacts.

Table 2.4-11 shows that the Preferred Alternative is projected to impact 7 of the 18 receptors analyzed. These seven receptors represent approximately 50 residences (Receptors 007, 021, and 063a), a high school (Receptor 062), a preschool (Receptor 003), and two campgrounds (Receptors 001 and 009). The impacts at three of these receptors (Receptors 009, 021, and 062) are due solely to the increases in noise levels resulting from the project. At Receptor 063a, the unmitigated noise level is projected to be lower than approaching the NAC; these receptors are still impacted because of the projected increase in noise levels. Noise abatement will need to be considered for all seven of these receptors with the Preferred Alternative.

The Supplemental Noise Assessment determined that the Preferred Alternative would impact 5 of the 55 receptors analyzed in the newly developed areas of the Talega Community. These five impacted receptors would be in addition to the seven receptors impacted along the other portions of the

corridor. The newly identified receptors were located within the San Mateo Campground. Noise abatement will be considered as part of final design for all of the receptors impacted by the proposed project.

**Summary of Impacts Related to Noise.** Noise levels were modeled for the Preferred Alternative that would potentially impact each receptor. Peak-hour noise levels were calculated and compared to the appropriate FHWA/Caltrans NAC. Noise abatement was considered for receptors projected to be exposed to noise levels that approach or exceed the applicable NAC. Table 2.4-11 summarizes the direct adverse noise impacts under the Preferred Alternative to identified receptors. These are the noise impacts from the noise generated on the highways that would be constructed or physically altered by the project. The number of residences, businesses, schools, and parks that would be impacted by traffic noise due to the implementation of the Preferred Alternative are shown. Impacted means that they would experience noise levels approaching (i.e., within 1 dB of) or exceeding the FHWA NAC, or they will experience a substantial increase as defined by Caltrans (12 dBA or greater). Table 2.4-12 then presents the approximate cost of noise abatement. The bottom part of the table presents the number of residences, businesses, schools and parks impacted with the implementation of the recommended mitigation presented below in Section 2.4.4.

### Table 2.4-12: Summary of Noise Impacts

| Before Noise Abatement | |
|---|---|
| # Residences Impacted[1] | 50 |
| # Businesses Impacted[1] | 0 |
| # Schools Impacted[1] | 2 |
| # Parks Impacted[1] | 2 |
| **Approximate Cost of Noise Abatement Walls (Millions)[2]** | $2.30 |
| **With Noise Abatement** | |
| # Residences Impacted[1] | 1 |
| # Businesses Impacted[1] | 0 |
| # Schools Impacted[1] | 0 |
| # Parks Impacted[1] | 0 |

Source: Mestre Greve Associates (2003).

[1] Impacted means exposed to noise levels approaching or exceeding the FHWA/Caltrans NAC or experiencing a substantial noise increase per Caltrans Definition of 12 dBA $L_{eq}$(H).

[2] Based on minimum wall heights satisfying Caltrans criteria (i.e., at least 5 dB reduction and breaks line-of-sight to 3.5 m (11.5 ft) truck stack and costs $150 per square meter ($14 per square feet) of sound barrier).

One residence will be impacted under the Preferred Alternative with respect to the FHWA criteria, even with noise abatement. This is a single residence (Receptor 021) that is projected to experience a substantial noise increase with these Alternatives. The analysis shows that, per FHWA/Caltrans criteria, it would not be reasonable to provide a sound wall for this single residence. There are several other receptors in the area of this receptor that are not subject to a substantial noise increase. However, the existing noise level measured at this receptor was much lower than the other receptors,

resulting in the substantial noise increase. Because this only occurs at one residence and the ultimate noise level is still well below the NAC, the Preferred Alternative would not result in an adverse noise impact.

## Impacts in Coastal Zone

**Modeled Noise Levels for the SOCTIIP Alternatives.** Table 2.4-13 presents future with project noise levels at the receptors for the Preferred Alternative within the Coastal Zone. For each receptor, the FHWA/Caltrans NAC and activity category are presented along with the existing noise level. The future with project noise level is presented along with the increase over existing conditions. Noise levels and increases where the noise level approaches or exceeds the NAC or exceeds the existing noise level by 12 dB or more are shown in **bold**.

### Table 2.4-13: Preferred Alternative Predicted Traffic Noise Impacts

| Receptor ID | Activity Category | NAC | Existing | Modeled Peak Hour Noise Level (dBA $L_{eq}$[h]) | Change Over Existing[1] |
|---|---|---|---|---|---|
| 001 | B | 67 | 65 | **67** | **(2)** |
| 002 | B | 67 | 60 | 63 | (3) |
| 003 | B | 67 | 66 | **74** | **(8)** |
| 004 | B | 67 | 61 | 64 | (3) |
| 005 | B | 67 | 59 | 61 | (2) |
| 007 | B | 67 | 66 | **71** | **(5)** |
| 009[2] | B | 67 | 47 | **60** | **(13)** |

Source: Mestre Greve (2003).

[1] Numbers in parentheses show increase over existing conditions with Alternative. **Bold** numbers show traffic noise impacts.

[2] Receptor 009 is within the San Mateo campground, which is adjacent to (but not within) the Coastal Zone.

Table 2.4-12 shows that the Preferred Alternative is projected to impact three of the six receptors analyzed within the Coastal Zone. These three receptors represent approximately 13 residences (Receptor 007), a preschool (Receptor 003), and a campground (Receptors 001). Noise abatement will be implemented for these three receptors with the Preferred Alternative. Sound walls will be constructed on MCB Camp Pendleton via a temporary construction easement. The sound walls will be constructed of concrete block, and their locations are depicted on Figure 2.4-1. The walls are generally 15 to 20 feet in height. Receptor 009, the San Mateo Campgrounds, is adjacent to (but not within) the Coastal Zone. The impact at this receptor is due solely to the increases in noise levels resulting from the project, and noise abatement will also be implemented for this receptor.

## 2.4.4 MITIGATION

### Mitigation for Construction Noise Impacts

This section identifies methods of minimizing the impacts of construction noise associated with the Preferred Alternative within the Coastal Zone. The measures are also included in the Mitigation Monitoring and Reporting Program, Appendix A of this document. As discussed, the heavy grading, pile driving, and general construction phases of the Preferred Alternative may all generate substantial adverse noise impacts if these activities occur during nighttime or weekend hours. Haul route trucks and nighttime demolition may also generate adverse noise impacts. Construction noise mitigation measures recommended for the SOCTIIP and applicable to the Coastal Zone of the Preferred Alternative are described below. Mitigation Measure N-5 is not included because it was specific to nighttime demolition associated with the I-5 Alternative, which would include demolition of residences and businesses adjacent to other residences and businesses. In addition to the mitigation measures listed below, Project Design Feature (PDF) 6-1 requires sound walls as needed to meet agency requirements.

**PDF 6-1** **Sound Walls for the Corridor Alternatives.** Sound walls to reduce noise impacts on adjacent sensitive land uses under the corridor Alternatives will be provided consistent with FHWA, Caltrans, and local noise standards. The locations of the noise walls included in the corridor Alternatives are shown on detailed maps in Appendix K. Some of these noise walls will be outside the disturbance limits and rights-of-way for the corridor Alternatives. Those noise walls would be adjacent to existing sensitive land uses to maximize the noise reduction benefits of these walls for the adjacent sensitive uses. Those walls would be constructed on the affected property, with the permission of the property owner, and would become the property of that property owner. The disturbance limits for these walls would be limited to the area directly adjacent to the walls. The construction access to these wall locations would be from the property owner's access (driveway) from the nearest public road and not from the disturbance limits for the build Alternatives. The noise walls for the SOCTIIP build Alternatives, including walls outside the disturbance limits, are shown on the detailed maps in Appendix K.

**N-1** **Local Control of Construction Hours.** During construction, the construction contractor will be responsible for limiting hours of construction in a manner consistent with the Orange County Noise Ordinance. This ordinance prohibits construction and grading activities between the hours of 8:00 p.m. and 7:00 a.m. on weekdays and Saturdays, or at any time on Sunday or a federal holiday in circumstances where the ordinance noise standards may otherwise be exceeded. The impact analysis indicates that the restriction of construction hours would typically occur when pile driving is within 850 m (2,800 ft) of noise-sensitive land uses, heavy grading occurs within 1,500 m (5,000 ft) of noise-sensitive land uses, and when general construction occurs within 275 m (900 ft) of noise-sensitive land uses. However, these distances are only a guide due to the large variation in construction activities. In all cases, compliance with the Orange County Noise Ordinance and/or any applicable city Noise Ordinance is the critical requirement. However, there may be a potential need to conduct nighttime pile driving during construction of corridor Alternatives that have a direct connection with I-5 and the Alternatives that widen I-5. Where proposed pile driving for I-5 requires a lane closure, it is anticipated that this work will need to be performed at night to minimize associated traffic congestion. Nighttime pile driving will only be allowed on review

of the construction plans for the corridor Alternatives by the TCA or for the other Alternatives by the implementing agency to confirm that appropriate noise attenuation measures are in place, including appropriate notification of the public. Any project construction activities planned between 7:00 p.m. and 7:00 a.m. on MCB Camp Pendleton will require approval from the TCA in consultation with the Commanding General of Camp Pendleton. For any portion of this project that may be constructed on MCB Camp Pendleton in San Diego County (outside the area of jurisdiction of the Orange County Noise Ordinance or outside the area of jurisdiction of San Clemente's Noise Ordinance), approval of the planned hours of construction, including any need to perform nighttime pile driving, will rest solely with the Commanding General of Camp Pendleton.

*Note: All construction activity in the Coastal Zone is on MCB Camp Pendleton.*

N-2 **Construction Equipment.** During construction activities, the construction contractor will ensure that the construction vehicles and equipment shall be maintained in tune, as required by local ordinances. Additionally, each internal combustion engine used on the job shall be equipped with a "residential" or "hospital" grade muffler.

N-3 **Schools Adjacent to Construction Zone.** Prior to construction activities in the vicinity of any school, the construction contractor shall be responsible for developing an agreement with Capistrano Unified School District, Camp Pendleton, and private school operators, as appropriate, that would mitigate construction noise levels in classrooms and playfields at the affected schools to an agreed-to construction noise performance standard. Each agreement shall be completed prior to the initiation of any grading on construction within 600 m (2,000 ft) of the school grounds. Examples of noise mitigation options include construction of temporary sound walls and limitation of some of the noisiest construction activities to periods when the schools are closed (e.g., the summer for the two public schools).

N-4 **Haul Routes.** Prior to construction activities, the construction contractor shall establish haul routes that avoid passing through or are adjacent to residential and school areas to the extent feasible. In general, truck routes should be directed away from residential areas and onto the I-5 to minimize the construction truck intrusion. If haul routes must pass through residential areas, haul route traffic should be limited to daytime hours (7:00 a.m. to 8:00 p.m.). The haul routes will be developed in conjunction with the applicable local jurisdictions.

*Note: The haul route in the Coastal Zone is existing I-5.*

N-6 **Noise Complaint Officer.** Prior to construction activities, the construction contractor shall identify a Noise Complaint Officer and establish a noise complaint hotline. The noise complaint hotline shall be able to receive calls on a 24-hour basis. Any complaints regarding construction shall be forwarded to the Noise Complaint Officer. The Noise Complaint Officer shall record the general description of the complaint, the time the offending noise occurred, and the location of the complaint. The Officer shall attempt to measure the noise that generated the complaint within the following 24 hours. If the noise levels exceed those allowed during nighttime construction activities under the local Noise Ordinance, or activities are occurring that are inconsistent with the noise mitigation measures, then the construction contractor shall be responsible for correcting those problems within the following 48 hours.

The noise levels measured and any corrective actions shall be recorded with the original complaint form.

## Mitigation Measures for Long-Term Noise Impacts

Noise abatement must be considered to reduce the noise levels at identified receptors along the Preferred Alternative that are projected to approach or exceed the FHWA/Caltrans NAC. Noise abatement is considered for each area within the Coastal Zone where a receptor indicates that the future with project noise level approaches or exceeds the applicable NAC. The only practical noise abatement method to reduce exterior noise levels is sound barriers, which include walls, berms, or a combinations of walls and berms. Table 2.4-14 identifies the recommended height and attenuation level for each sound barrier for each receiver. Figure 2.4-1 shows the locations of these sound barriers. For noise abatement to be provided, it must be reasonable and feasible as defined by FHWA/Caltrans criteria. Long-term impact mitigation measures are recommended for the Preferred Alternative, as described below. These mitigation measures address the long-term noise impacts of the Preferred Alternative. The mitigation measures include noise abatement strategies to address impacts identified at the receptor locations that exceed the designated criteria.

### Table 2.4-14: Attenuated Noise Levels with Sound Walls at Receptor Locations

| With Barrier Noise Levels for A7C-FEC-M-Initial/Preferred[1] Peak-Hour Noise Level and Insertion Loss With Barrier of Height | | | |
|---|---|---|---|
| Receptor | Noise Level (w/o barrier dBA $L_{eq}$) | Recommended Barrier Height | Noise Level with Barrier (dBA $L_{eq}$) and Noise Reduction |
| 1 | 67 | 4.9 m (16 ft) | 61 (6) |
| 3 | 74 | 4.9 m (16 ft) | 65 (9) |
| 7 | 71 | 4.9 m (16 ft) | 66 (5) |
| 9a | 63 | 4.9 m (16 ft) | 56 (7) |
| 9b | 64 | 4.9 m (16 ft) | 56 (8) |
| 9c | 62 | 4.9 m (16 ft) | 56 (6) |
| 9e | 59 | 4.9 m (16 ft) | 54 (5) |
| 9f | 59 | 4.9 m (16 ft) | 54 (5) |

N-7 **Final Noise Analysis.** During final design of the selected Alternative, the TCA or the implementing agency/agencies will prepare a final noise analysis based on the detailed and finalized design developed during final design for the selected Alternative. Feasibility considerations for each sound barrier must meet FHWA/Caltrans criteria, including a minimum of 5 dB of noise reduction at the impacted receiver. Additional feasibility considerations are (1) topography, (2) access requirements for driveways, ramps, etc; (3) the presence of cross streets, (4) other noise sources in the area, and (5) safety considerations. The TCA or the implementing agency/agencies will finalize noise mitigation requirements for the selected Alternative and coordinate design with the local agency. As appropriate, the Final Noise Assessment Technical Report and the sound barrier/berm height recommended in the Final Noise Assessment Technical Report will serve as a guideline in determining the final barrier height requirements. Other pertinent information from the Final Noise Assessment Technical Report will be incorporated into final design as appropriate. The Final

Noise Assessment Technical Report will provide specific recommendations that will then be incorporated into the construction documentation (i.e., final design) for building purposes.

**N-8** **Long-Term Noise Impacts.** During construction, the TCA or the implementing agency/agencies shall implement permanent sound barriers, including walls, berms, or combinations of walls and berms. The sound barrier and/or supplemental berm must provide a minimum of 5 dB of noise reduction at the impacted receiver as refined during final design. The construction contractor will be responsible for constructing the sound barrier/berm for the selected Alternative and as refined during final design. The design and specifications of the sound walls, shown on Figures 5.2-79 through 5.2-82 in Appendix H of the Final SEIR, on MCB Camp Pendleton shall be approved by the Commanding General of Camp Pendleton.

### Commitments Related to Long-Term Noise Impacts

In addition to Mitigation Measures N-7 and N-8, which identify specific actions to avoid, minimize, or compensate for potential long-term adverse noise impacts, the following commitments are included in the project Alternatives:

**Commitment NC-1** **Determination of Reasonableness.** During final design, the TCA or the implementing agency/agencies shall determine the reasonableness of sound wall/berm placement and consider the life cycle of the sound barrier, the potential environmental impact of the mitigation, opinions of impacted residents, input from the public and local agencies, and social, economic, and environmental factors consistent with the FHWA/Caltrans feasibility criteria.

**Commitment NC-2** **Sound Wall/Floodplain.** During final design, if the TCA or the implementing agency/agencies locates a sound wall/berm in a floodplain, the TCA or the implementing agency/agencies shall prepare an evaluation of the effects of the sound wall on the floodplain in accordance with appropriate guidelines and design manuals. The design and location will be determined to ensure there is no exceedance of the 1-foot elevation of the base floodplain. Early recognition and analysis of potential problem areas will be made to determine whether wall openings or staggered wall openings are viable for those barriers.

## 2.4.5 CONCLUSION

Activities that will create noise impacts during construction of the Preferred Alternative include pile driving, heavy grading, general construction activities, and haul routes. Implementation of the mitigation measures provided earlier will reduce the construction-related noise impacts to below a level of significance. Noise will be generated by traffic on the proposed project. Operation of the Preferred Alternative will result in an adverse noise impact, and the only practical way to mitigate outdoor traffic noise levels is through the construction of noise barriers. The barriers will mitigate the impact of the Preferred Alternative to below a level of significance.

# 2.5 AIR QUALITY

## 2.5.1 INTRODUCTION

Air quality concerns associated with the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) include short-term and long-term impacts resulting from the construction and operation of the Preferred Alternative. The Air Quality Technical Report (Mestre Greve Associates 2003) was reviewed to determine the potential impacts related to air quality in the SOCTIIP study area. Potential impacts to air quality are addressed in Section 4.7 of the Final SEIR.

## 2.5.2 SETTING

### Study Area Setting

Most of the SOCTIIP study area is in the South Coast Air Basin (SCAB) except for the southern portion, which is in San Diego County. The SCAB encompasses all of Orange County and the nondesert parts of Los Angeles, Riverside, and San Bernardino Counties. The SCAB is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The climate and topography in the SCAB make the SCAB highly conducive to the formation of air pollution. The segment of the SOCTIIP study area in San Diego County is in the most northern part of the San Diego Air Basin (SDAB), which shares similar meteorological conditions with the adjacent Orange County areas in the SCAB.

**Regional Climate.** Meteorological conditions in the SCAB such as light winds and shallow vertical mixing, and topographical features such as surrounding mountain ranges, hinder the dispersal of air pollutants. The strength and location of a semipermanent, subtropical high-pressure cell over the Pacific Ocean primarily control the climate of the SCAB. Climate is also affected by the moderating effects of the nearby oceanic heat reservoir. Warm summers, mild winters, infrequent rainfall, moderate daytime onshore breezes, and moderate humidities characterize the climate throughout most of the SCAB and adjacent areas of the SDAB.

Frequent temperature inversions trap air pollutants in a limited atmospheric volume near the ground and hamper dispersion. Southern California frequently experiences temperature inversions, which inhibit pollutant dispersal. Inversions may be either ground-based or elevated. Ground-based inversions are most severe during clear, cold, early winter mornings. Elevated inversions act as a lid or upper boundary and restrict vertical mixing. Mixing heights for elevated inversions are lower and more persistent in the summer. Low summer inversions are partly responsible for the high levels of ozone ($O_3$) experienced during the summer months.

During summer's longer daylight hours, abundant sunshine provides sufficient energy to fuel the photochemical reactions between nitrogen oxide ($NO_X$) and reactive organic compounds (ROC), which form $O_3$. To form high levels of $O_3$, there must be ample sunlight, early morning stagnation in

source areas, high surface temperatures, strong and low morning inversions, greatly restricted vertical mixing during the day, and daytime subsidence that strengthens the inversion layer.

High nitrogen dioxide ($NO_2$) levels usually occur during the autumn or winter on days with summer-like weather conditions, including low inversions, limited daytime mixing, and stagnant windflows. Although days are clear, sunlight is limited in duration and intensity, and the photochemical reactions that would otherwise form $O_3$ are incomplete.

Atmospheric particulates are made up of fine solids or liquids such as soot, dust, aerosols, fumes, and mists. Many of the total suspended particulates (TSP) in the atmosphere are less than 10 microns in diameter. These fine particles are referred to as $PM_{10}$. As with $O_3$, a substantial fraction of $PM_{10}$ forms in the atmosphere as a result of chemical reactions. Peak concentrations of both $O_3$ and $PM_{10}$ occur downwind of the origin or precursor emission sources.

**Local Climate.** The SOCTIIP study area is influenced by the marine microclimate zone and is subject to coastal clouds or fog on spring and summer days, particularly in areas closer to the coast. Because of this marine influence, winter temperatures are warmer and summer temperatures are cooler than in inland areas of Orange County. The nearest locations to the SOCTIIP study area for which the South Coast Air Quality Management District (SCAQMD) has annual temperature data are in El Toro and Laguna Beach. For El Toro, the average mean temperature is 17°C (62°F) and for Laguna Beach it is 16°C (61°F). There are daily and seasonal temperature variations.

Winds in the SOCTIIP area are driven by the land/sea breeze circulation system. Wind patterns are dominated by daytime on-shore sea breezes. At night, the wind generally slows and reverses direction, traveling toward the sea. One other important wind regime occurs when a high-pressure center forms over the western United States and creates Santa Ana winds that blow from the northeast and east across Orange County to the ocean.

## Air Quality Management

Air quality in the SCAB and SDAB is regulated by federal, State, and regional control authorities, as described below.

**Federal.** The United States Environmental Protection Agency (EPA) has overall responsibility for ensuring that the nation meets the national ambient air quality standards (NAAQS). The EPA has oversight authority over State and local air quality planning and regulatory actions through requirements set forth in the federal Clean Air Act (CAA), as amended in 1990 (42 U.S.C. Section 7401 et. seq.). The NAAQS, which the CAA directs the EPA to set at levels to protect public health with an adequate margin of safety, are presented in Table 2.5-1.

## Table 2.5-1: Federal and State Ambient Air Quality Standards

| Pollutant | Averaging Time | California Standards[1] | | Federal Standards[2] | | |
|---|---|---|---|---|---|---|
| | | Concentration[3] | Method[4] | Primary[2,5] | Secondary[2,6] | Method[7] |
| Ozone ($O_3$) | 1-Hour | 0.09 ppm (180 µg/m$^3$) | Ultraviolet Photometry | -- | Same as Primary Standard | Ultraviolet Photometry |
| | 8-Hour | 0.07 ppm (137 µg/m$^3$) | | 0.08 ppm (157 µg/m$^3$) | | |
| Respirable Particulate Matter ($PM_{10}$) | 24-Hour | 50 µg/m$^3$ | Gravimetric or Beta Attenuation* | 150 µg/m$^3$ | Same as Primary Standard | Inertial Separation and Gravimetric Analysis |
| | Annual Arithmetic Mean | 20 µg/m$^3$* | | 50 µg/m$^3$ | | |
| Fine Particulate Matter ($PM_{2.5}$) | 24-Hour | No Separate State Standard | | 65 µg/m$^3$ | Same as Primary Standard | Inertial Separation and Gravimetric Analysis |
| | Annual Arithmetic Mean | 12 µg/m$^3$* | Gravimetric or Beta Attenuation* | 15 µg/m$^3$ | | |
| Carbon Monoxide (CO) | 8-Hour | 9.0 ppm (10 mg/m$^3$) | Nondispersive Infrared Photometry (NDIR) | 9 ppm (10 mg/m$_3$) | None | Nondispersive Infrared Photometry (NDIR) |
| | 1-Hour | 20 ppm (23 mg/m$^3$) | | 35 ppm (40 mg/m$^3$) | | |
| | 8-Hour (Lake Tahoe) | 6 ppm (7 mg/m$^3$) | | – | | |
| Nitrogen Dioxide ($NO_2$) | Annual Arithmetic Mean | – | Gas Phase Chemiluminescence | 0.053 ppm (100 µg/m$^3$) | Same as Primary Standard | Gas Phase Chemiluminescence |
| | 1-Hour | 0.25 ppm (470 µg/m$^3$) | | – | | |
| Lead | 30-day average | 1.5 µg/m$^3$ | Atomic Absorption | – | – | High-Volume Sampler and Atomic Absorption |
| | Calendar Quarter | – | | 1.5 µg/m$^3$ | Same as Primary Standard | |
| Sulfur Dioxide ($SO_2$) | Annual Arithmetic Mean | – | Ultraviolet Fluorescence | 0.030 ppm (80 µg/m$^3$) | – | Spectrophotometry (Pararosaniline Method) |
| | 24-Hour | 0.04 ppm (105 µg/m$^3$) | | 0.14 ppm (365 µg/m$^3$) | – | |
| | 3-Hour | – | | – | 0.5 ppm (1300 µg/m$^3$) | |
| | 1-Hour | 0.25 ppm (655 µg/m$^3$) | | – | – | |
| Visibility-Reducing Particles | 8-Hour | Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape. | | No Federal Standards | | |
| Sulfates ($SO_X$) | 24-Hour | 25 µg/m$^3$ | Ion Chromatography* | | | |
| Hydrogen Sulfide | 1-Hour | 0.03 ppm (42 µg/m$^3$) | Ultraviolet Fluorescence | | | |
| Vinyl Cloride[9] | 24-Hour | 0.01 ppm (26 µg/m$^3$) | Gas Chromatography | | | |

Source: ARB (May 2005).

Footnotes can be found on the next page.

1 California standards for ozone; carbon monoxide (except Lake Tahoe); sulfur dioxide (1- and 24-hour); nitrogen dioxide; suspended particulate matter, $PM_{10}$; and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2 National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth-highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For $PM_{10}$, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

3 Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25° C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25° C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4 Any equivalent procedure that can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7 Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

8 New federal 8-hour ozone and fine particulate matter standards were promulgated by the EPA on July 18, 1997. Contact EPA for further clarification and current federal policies.

9 The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

The air quality provisions of the CAA as amended, the transportation planning provisions of 23 CFR Section 771 et seq., and Title 49 of the United States Code (Transportation) are intended to ensure that integrated transportation and air quality planning occur in areas designated by the EPA as nonattainment or maintenance areas. On November 24, 1993, the EPA published criteria in the Federal Register (58 F.R. 62235; 40 CFR Part 93) for implementing CAA conformity requirements for both general development and transportation projects. According to the CAA, transportation plans, programs, and projects cannot: (1) create new violations of the federal air quality standards, (2) increase the frequency or severity of existing violations of the standards, or (3) delay attainment of standards.

**California.** The California Air Resources Board (ARB), a department of the California Environmental Protection Agency (CalEPA), is responsible for regulating mobile sources of pollution (including automobiles and trucks), preparing the State Implementation Plan (SIP) on the basis of locally prepared plans, and serving in an oversight capacity over all regional and county air pollution control districts in California.

**Regional.** All air districts in California are regulated through the California Health and Safety Code in Division 26 (Health and Safety Code Section 39000 et seq.), which sets forth their general powers

and duties. The two districts with jurisdiction over the areas traversed by the Preferred Alternative are the SCAQMD, which includes Orange County, and the San Diego County Air Pollution Control District (SDAPCD). The SCAQMD is a regional district with primary responsibility for monitoring air quality, planning for air quality attainment, and regulating sources of air pollution in its jurisdiction, which includes the SCAB. The SDAPCD is responsible for air quality control in San Diego County.

Since the certification of the SOCTIIP Subsequent Environmental Impact Report (SEIR), the attainment status of State and federal standards in the SCAB and SDAB have changed. The attainment status at the time of the SEIR certification is compared to the current status in Table 2.5-2.

**Table 2.5-2: Attainment Status for the SCAB and SDAB**

| | | Status at Time of SEIR | | Current Status | |
|---|---|---|---|---|---|
| **Area** | **Pollutant** | **Federal Designation** | **State Designation** | **Federal Designation** | **State Designation** |
| SCAB | $O_3$ 1-hour | Extreme nonattainment | Extreme nonattainment | Revoked June 2005 | Nonattainment |
| | $O_3$ 8-hour | N/A | N/A | Severe nonattainment | N/A |
| | CO | Serious nonattainment | Serious nonattainment | Serious nonattainment | Attainment |
| | $PM_{10}$ | Serious nonattainment | Serious nonattainment | Serious nonattainment | Nonattainment |
| | $PM_{2.5}$ | N/A | N/A | Nonattainment | Nonattainment |
| | $NO_X$ and $SO_X$ | Attainment | Attainment | Attainment/Maintenance | Attainment |
| | | | | | |
| SDAB | $O_3$ 1-hour | Attainment | Serious nonattainment | Revoked June 2005 | Nonattainment |
| | $O_3$ 8-hour | N/A | N/A | Nonattainment | Not established |
| | CO | Attainment | Attainment | Attainment | Attainment |
| | $PM_{10}$ | Unclassified | Nonattainment | Unclassified | Nonattainment |
| | $PM_{2.5}$ | N/A | N/A | Attainment | Nonattainment |
| | $NO_X$ and $SO_X$ | Attainment | Attainment | Attainment | Attainment |

**South Coast Air Quality Management District.** The SCAQMD is a regional district with primary responsibility for monitoring air quality, planning for air quality attainment and regulating sources of air pollution in its jurisdiction. Although the SCAQMD has some authority to regulate motor vehicle use, it is not allowed to control direct emissions from motor vehicles.

The SCAB has been designated by the EPA as extreme nonattainment area for $O_3$, and serious nonattainment for carbon monoxide (CO) and $PM_{10}$. The SCAB has met the federal standards for $NO_2$ for the third year in a row and therefore is qualified for redesignation to attainment. Attainment of all federal $PM_{10}$ health standards is to be achieved by December 31, 2006, and $O_3$ standards are to be achieved by November 15, 2010. The SCAB was designated as a severe nonattainment area for the 8-hour ozone standard in April 2004 with the requirement to achieve

attainment expeditiously but no later than 2021. SCAB is currently designated as a maintenance area for $NO_2$. Three days during 2000 exceeded the federal CO standard. The EPA gave SCAQMD a 2-year extension period to reach the CO attainment goal by December 31, 2002. The federal and state standards for CO were met at the end of 2002. However, SCAB is still formally designated as a nonattainment area for CO until EPA redesignates it as an attainment area. SCAQMD plans to submit a proposed maintenance plan to the EPA in late fall/early winter 2003.

SCAQMD and Southern California Association of Governments (SCAG), in coordination with local governments and the private sector, have developed the Air Quality Management Plan (AQMP) for the SCAB. The overall control strategy for the AQMP is to meet applicable State and federal requirements and to demonstrate attainment with the ambient air quality standards (AAQS). The 1997 AQMP uses two tiers of emission reduction measures: (1) short- and intermediate-term measures, and (2) long-term measures.

Short- and intermediate-term measures propose available technologies and management practices between 1994 and 2005. These measures rely on known technologies and proposed actions to be taken by several agencies that currently have statutory authority to implement such measures. Short- and intermediate-term measures in the 1997 AQMP include 35 stationary source, 7 on-road, 6 off-road, 1 transportation control and indirect source, 5 advanced transportation technology, and 1 further study measures. All these measures are proposed to be implemented between 1995 and 2005. These measures rely on both traditional command and control and on alternative approaches to implement technological solutions and control measures.

To ultimately achieve the NAAQS, additional emission reductions will be necessary beyond the implementation of these short- and intermediate-term measures. Long-term measures rely on the advancement of technologies and control methods that can reasonably be expected to occur between 1997 and 2010. These long-term measures rely on further development and refinement of known low and zero emission control technologies for both mobile and stationary sources along with technological breakthroughs.

The "Draft 2003 Air Quality Management Plan" (Draft 2003 AQMP) was released in early 2003 and was adopted locally August 1, 2003. The California Clean Air Act (CCAA) requires a nonattainment area to update its AQMP triennially to incorporate the most recent available technical information. In addition, 40 CFR Part 93 requires that the latest planning assumptions be used in all transportation conformity determinations. The ARB and SCAB elected to update the mobile source emissions budgets contained in the SIPs to maintain consistency with the latest planning assumptions that will be used in future conformity determinations. Since the 1997 AQMP and 1999 amendments, updated demographic data have become available, new air quality episodes have been identified, and the science of estimating motor vehicle emissions and air quality modeling techniques for $O_3$ and $PM_{10}$ has improved. Therefore, a plan update is necessary to ensure continued progress toward attainment to avoid a transportation conformity lapse.

The Draft 2003 AQMP addresses all criteria pollutants including $PM_{10}$, $O_3$, and CO. Toxic air contaminants are not addressed in the AQMP. The Draft 2003 AQMP includes improved emission inventories, updated motor vehicle emission budgets for transportation conformity purposes, and an update to the attainment demonstration for $PM_{10}$, $O_3$, and CO. The overall control strategy is comprised of the District's stationary and mobile source control measures,

ARB's proposed 2003 State and federal strategy for the California SIP and SCAG's transportation control measures.

The SCAQMD, on August 1, 2003, adopted the 2003 AQMP. The Draft 2003 AQMP was reviewed and approved by ARB on October 24, 2003. It now goes to the EPA for their review and possible approval. No schedule has been announced for the EPA review as of this writing (December 2003).

**San Diego County Air Pollution Control District.** The SDAPCD is responsible for air quality control in San Diego County. The SDAB is a maintenance area for CO. San Diego County is a serious nonattainment area for the State $O_3$ AAQS. The County is in attainment for the federal $O_3$ standard. As in the SCAB, the CCAA directs State-required air quality planning in San Diego County. The SDAPCD and the San Diego Association of Governments (SANDAG), which prepare the attainment plans required by the State and the CAA, share agency responsibility for air quality planning in San Diego County.

The most recent update to the SIP for San Diego County was released by the SDAPCD in April 1998. The plan, prepared by the SDAPCD, is simply an update of their stationary source control measures. More recent air planning documents for the SDAB include "The San Diego Air Basin Triennial Regional Air Quality Strategy Revision" (SDAPCD, August 2001) and the "Ozone Redesignation Request and Maintenance Plan for San Diego County" (SDAPCD, December 2002).

San Diego County has not attained the State $O_3$ standard and as such is required by the CCAA to prepare the Regional Air Quality Strategy Revision (RAQS). The RAQS identifies emission control strategies to provide expeditious progress toward attaining the State $O_3$ standard. The 2001 RAQS only proposed the adoption of one additional control measure that would require add-on control equipment for degassing of aboveground gasoline storage tanks at bulk plants and bulk terminals during cleaning, repairing or decommissioning operations.

In 1999, San Diego County did not have any exceedances of the national $O_3$ standard for the first time in their monitoring history. The County has continued to not exceed the $O_3$ standard in subsequent years. Therefore, in 2002 the SDAPCD filed the redesignation request with the ARB and subsequently the EPA to change their designation from a "serious ozone nonattainment area" to an attainment area. The redesignation request documents the steadily declining $O_3$ concentrations in the County, references the stationary source controls imposed by the County, and provides emission inventories for past, current, and future years for $O_3$ precursors (i.e., volatile organic compounds [VOC] and $NO_X$). On June 26, 2003, the EPA published the redesignation of San Diego County to attainment for the 1-hour $O_3$ national standard in the Federal Register. The EPA at that time also approved the maintenance plan and emission budgets contained in the redesignation request. Since the publication of the Draft EIS/SEIR, the SDAB was designated as nonattainment for the 8-hour ozone standard and is classified as a "basic" area with a 2009 attainment deadline.

Please see Table 2.5-2 for the current attainment status.

**Monitored Air Quality.** Because the SCAQMD and SDAPCD do not have monitoring stations in the SOCTIIP study area, the Transportation Corridor Agencies (TCA) conducted special monitoring for CO and $PM_{10}$ to establish baseline conditions without the SOCTIIP Build Alternatives. These are the two pollutants with the greatest potential to cause local hotspots. Monitoring was conducted at the following locations (Sites 1 and 2 are excluded from this discussion since they are not in the vicinity of the Preferred Alternative):

**Site 3:** This site is on the roof of the San Clemente High School administration building at 700 Avenida Pico in San Clemente. This site was selected to identify baseline conditions and exposures to sensitive receptors at the High School.

**Site 4:** This site is on the roof of a storage building at Our Lady of Fatima Church at 105 La Esperanza in San Clemente. This site contained two side-by-side samplers and was selected to provide baseline data for areas near Avenida Pico.

**Site 5:** This site is at a maintenance yard for the San Mateo Campgrounds and San Onofre State Beach (SOSB) on the northernmost part of Camp Pendleton. This site represented the southern boundary of the SOCTIIP study area.

Results of the air quality monitoring are shown in Tables 2.5-3 through 2.5-5.

**Sensitive Receptors.** Receptors sensitive to air pollution occur in all areas with a human presence due to potential adverse health effects. Residential, school, and hospital areas are often considered to be the most sensitive due to the presence of children and the infirm. However, there are people sensitive to air pollution in office developments, industrial areas, and all through developed areas.

There are developed areas continuously along Interstate 5 (I-5) throughout the SOCTIIP study area. The land uses along I-5 include residences, schools, commercial centers, office complexes, and other urban and suburban uses.

The southern segment of the Preferred Alternative, including the Coastal Zone, is in proximity to developed areas. The northern segment is not adjacent to developed areas except for the extreme north end, which is next to Tesoro High School. The Preferred Alternative passes through the Talega PC, through The Donna O'Neill Conservancy, and traverses SOSB.

## Coastal Zone Setting

The Coastal Zone of the Preferred Alternative is in the SDAB, which is discussed in the previous section. Land used in the Coastal Zone includes I-5, MCB Camp Pendleton training areas, and SOSB on the military base.

## Table 2.5-3: $PM_{10}$ Concentrations (in $\mu g/m^3$), August 13 to October 12, 1995

| Day | SOCTIIP Study Area Sites[1] | | | El Toro[2] (SCAQMD) | Oceanside[3] (SDAPCD) |
|---|---|---|---|---|---|
| | Site 3[4] | Site 4[5] | Site 5[6] | | |
| Aug. 13 | 22.76 | 23.59 | 24.43 | 38 | 27 |
| 16 | 20.95 | 22.03 | 19.99 | | |
| 19 | 21.70 | 26.92 | 29.14 | ND | 36 |
| 22 | 23.54 | 27.35 | 27.21 | | |
| 25 | 20.67 | 23.25 | 21.67 | 45 | 27 |
| 28 | 28.57 | 23.96 | 33.68 | | |
| 31 | 34.20 | 44.87 | 38.16 | 58 | 44 |
| Sept. 3 | 23.27 | 25.91 | 26.49 | | |
| 6 | 21.89 | 25.43 | 27.20 | 36 | 32 |
| 9 | 16.62 | 18.21 | 15.55 | | |
| 12 | 21.91 | 29.13 | 22.84 | 48 | 31 |
| 15 | VD | 25.07 | 28.37 | | |
| 18 | 22.39 | 25.34 | 25.31 | 34 | 27 |
| 21 | 18.75 | 20.01 | 20.89 | | |
| 24 | 20.20 | 23.35 | 21.86 | 30 | 27 |
| 27 | 16.53 | 24.83 | VD | | |
| 30 | 26.73 | 35.54 | 28.80 | 45 | 36 |
| Oct. 3 | 22.87 | 28.69 | 23.06 | | |
| 6 | 21.65 | 27.95 | 28.41 | 39 | 39 |
| 9 | 35.34 | 43.17 | 39.63 | | |
| 12 | 43.31 | 51.61 | 48.17 | 62 | 43 |

Source: Mestre Greve Associates (2003).

$\mu g/m^3$=micrograms per cubic meter
NI=Not installed.
MF=Motor failed.
ND=No data available.
NR=Did not run.
VD=Void.

1 Source: Aerovironment, Inc. (January, 1996).
2 Source: South Coast Air Quality Management District (August 7, 1996).
3 Source: San Diego County Air Pollution Control District (August 6, 1996).
4 San Clemente High School: administration building roof.
5 105 La Esperanza, San Clemente: adjacent to I-5.
6 San Mateo Campgrounds, Camp Pendleton.

## Table 2.5-4: $PM_{10}$ Concentrations (in $\mu g/m^3$), January 15 to February, 1996

| Day | SOCTIIP Study Area Sites[1] | | | El Toro[2] (SCAQMD) | Oceanside[3] (SDAPCD) |
|---|---|---|---|---|---|
| | Site 3[4] | Site 4[5] | Site 5[6] | | |
| Jan. 16 | 17.86 | 18.35 | PF | 22.0 R | 27.6 |
| 19 | 4.23 | 15.98 | 14.22 | | |
| 22 | 9.23 | 12.43 | 12.28 | 19.0 R | 18.7 |
| 25 | PF | 10.30 | 8.81 | | |
| 28 | 6.75 | 7.74 | 7.53 | 14.0 R | 24.7 |
| 31 | 7.51 | 9.54 | 9.34 | | |
| Feb. 3 | 9.04 | MF | 10.78 | 20.0 R | 19.3 |
| 6 | 16.37 | 17.57 | 13.55 | | |
| 9 | 14.66 | 15.84 | 15.25 | 20.0 | 26.5 |
| 12 | 27.41 | 32.75 | 33.40 | | |
| 15 | 33.35 | 35.91 | 32.05 | 58.0 | 37.4 |

Source: Mestre Greve Associates (2003).

$\mu g/m^3$=micrograms per cubic meter
MF=Motor failure.
PF=Power failure.
R =Rain.

[1] Source: Aerovironment, Inc. (January, 1996).
[2] Source: South Coast Air Quality Management District (August 7, 1996). **[The monitoring site is now located in Mission Viejo? Checking with Keith]**
[3] Source: San Diego County Air Pollution Control District (August 6, 1996).
[4] San Clemente High School: administration building roof.
[5] 105 La Esperanza, San Clemente: adjacent to I-5.
[6] San Mateo Campgrounds, Camp Pendleton.

## Table 2.5-5: Peak Daily Carbon Monoxide Concentrations (in ppm), January 15 to February 15, 1996

| Day | SOCTIIP Study Area Sites[1] | | | El Toro[2] (SCAQMD) | Oceanside[3] (SDAPCD) |
|---|---|---|---|---|---|
| | Site 3[4] | Site 4[5] | Site 5[6] | | |
| Jan 15 | 0.4 | ND | 1.1 | 5.0 | 1.6 |
| 16 | 0.9 | ND | 0.7 | 2.0 | 1.6 |
| 17 | 1.6 | 0.3 | 0.7 | 3.0 | 1.5 |
| 18 | 0.8 | 0.6 | 0.6 | 4.0 | 1.7 |
| 19 | 0.9 | 0.2 | 0.6 | 2.0 | 1.4 |
| 20 | 1.0 | 0.9 | 0.8 | 3.0 | 1.7 |
| 21 | 1.2 | 0.3 | 0.6 | 1.0 | 1.0 |
| 22 | 1.2 | 0.8 | 0.6 | 3.0 | 1.0 |
| 23 | 0.8 | 0.6 | 0.7 | 4.0 | 1.5 |
| 24 | 1.4 | 1.0 | 0.9 | 3.0 | 1.8 |
| 25 | 1.8 | 0.7 | 0.7 | 3.0 | 1.7 |
| 26 | 2.0 | 1.0 | 1.0 | 2.0 | 2.0 |
| 27 | ND | 1.0 | 1.2 | 3.0 | 2.0 |
| 28 | 0.8 | 0.9 | 0.7 | 2.0 | 1.7 |
| 29 | 0.6 | 0.8 | 0.8 | 3.0 | 1.4 |
| 30 | ND | 0.8 | 0.8 | 3.0 | 2.0 |
| 31 | 0.8 | 0.3 | 0.7 | 1.0 | 1.1 |
| Feb. 1 | 0.8 | 0.4 | 0.8 | 2.0 | 1.2 |
| 2 | 0.7 | 0.2 | 0.7 | 3.0 | 1.4 |
| 3 | 0.8 | 0.7 | 0.7 | 6.0 | 1.6 |
| 4 | 1.3 | 1.1 | 1.2 | 4.0 | 2.0 |
| 5 | 1.7 | 2.1 | 1.8 | 3.0 | 1.5 |
| 6 | 1.7 | 2.2 | 1.3 | 5.0 | 1.2 |
| 7 | 2.2 | 3.3 | 1.7 | 3.0 | 2.7 |
| 8 | 2.1 | 2.5 | 1.1 | 6.0 | 1.6 |
| 9 | 1.2 | 0.9 | 0.8 | 5.0 | 1.6 |
| 10 | 1.0 | 0.7 | 0.7 | 6.0 | 0.9 |
| 11 | 1.7 | 1.1 | 1.0 | 5.0 | 1.2 |
| 12 | 2.7 | 1.3 | 1.1 | 6.0 | 1.9 |
| 13 | 1.6 | 1.3 | 0.9 | 4.0 | 1.7 |
| 14 | 2.2 | 2.2 | 0.9 | 3.0 | 1.2 |
| 15 | 2.2 | 1.5 | 0.9 | 5.0 | 1.2 |

Source: Mestre Greve Associates (2003).

ppm = parts per million
ND=No data.

1 Source: Aerovironment, Inc. (January, 1996).
2 Source: South Coast Air Quality Management District (August 7, 1996).
3 Source: San Diego County Air Pollution Control District (August 6, 1996).
4 San Clemente High School: administration building roof.
5 105 La Esperanza, San Clemente: adjacent to I-5.
6 San Mateo Campgrounds, Camp Pendleton.

### Updated Information

Since the time that the Draft EIS/SEIR was prepared, SCAG adopted an updated Regional Transportation Plan (RTP) (2004) and Regional Transportation Improvement Plan (RTIP) (2004). Foothill Transportation Corridor-South (FTC-S) is also included in both the 2004 and 2006 SANDAG RTPs. The SCAB was designated as a severe nonattainment area for the 8-hour $O_3$ standard in April 2004 with the requirement to achieve attainment expeditiously but no later than 2021. SCAB is currently designated as a maintenance area for $NO_2$. Also since the publication of the Draft EIS/SEIR, the San Diego Air Basin was designated as nonattainment for the 8-hour $O_3$ standard and is classified as a "basic" area with a 2009 attainment deadline. Please see Table 2.5-2 for the current attainment status. In addition, the FHWA issued interim guidance regarding Mobile Source Air Toxics (MSAT) in February 2006, about the time that the Final SEIR was certified.

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements being required by the Marine Corps. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.5.3 IMPACTS

### Methodology

This section summarizes the air quality methodology used to assess air quality impacts. For more details refer to the Final SEIR and the Air Quality Technical Report (Mestre Greve Associates, 2003).

Potential long-term air quality impacts are commonly divided into regional and local impacts. The air pollutant that exceeds the ambient air quality standards most often in Southern California is $O_3$, which is a regional air pollutant. The accepted procedure to assess regional impacts is to forecast the pollutants that will be directly emitted. These quantities are then compared to thresholds and to regionwide emission levels to ascertain whether these emissions will result in adverse regional air quality impacts.

In general, the "Transportation Project-Level Carbon Monoxide Protocol" (University of California at Davis, December 1997) was followed for the local air quality assessment. This document, commonly referred to as the Caltrans Protocol, was developed for use by the California Department of Transportation (Caltrans).

The air quality impacts in the SOCTIIP area due to nearby roads were assessed with the CALINE4 computer model. CALINE4 is a fourth-generation line source air quality model developed by Caltrans ("CALINE4," Report No. FHWA/CA/TL-84/15, June 1989). The purpose of the model is to

assess air quality impacts near transportation facilities in the microscale region, which is defined as an area a few kilometers around a pollutant source.

## Project Impacts

**Construction Impacts.** The Preferred Alternative will result in short-term emissions during construction. Air pollutants will be emitted by construction equipment, and fugitive dust will be generated from grading activities. Typically, the pollutant emissions due to grading activities would primarily consist of $PM_{10}$, while emissions from construction equipment would consist of CO and $NO_X$. Construction of the Preferred Alternative will also include demolition of a number of existing residential and nonresidential structures.

Peak periods of construction will result in the greatest levels of short-term air pollution emissions. Construction information was based on the worst-case peak construction day during which a maximum number of pieces of equipment and area (hectares/acres [ha/ac]) disturbed per day were assumed. Construction equipment would consist of haul trucks, graders, dozers, loaders, and other heavy construction equipment; crew size and commuting trips; ancillary equipment; miscellaneous vehicles; and equipment associated with demolition.

The durations of the construction periods are anticipated to range between 30 and 42 months, depending on the scenario. The proposed construction work hours are 8 hours a day, 5 days a week. Some night construction, largely related to pile driving and demolition of existing structures, will occur for limited periods. No earthmoving would occur during night construction. There would be only a small number of construction equipment operating during nighttime construction. The peak construction periods with the largest numbers of construction equipment and all earthmoving would occur during the day. Therefore, the air quality analysis of construction impacts focuses on construction activities during the day.

Typically, the pollutant emissions due to grading would be primarily $PM_{10}$, while emissions from construction equipment would be CO and $NO_X$. According to the SCAQMD's 1993 CEQA Air Quality Handbook, the emission factor for disturbed soil is 0.40 tons of $PM_{10}$ per month per acre. If water or other soil stabilizers are used to control dust as required by SCAQMD Rule 403, these potential emissions can be reduced by up to 50 percent.

For the Preferred Alternative, construction equipment produces the greatest amount of emissions for all the criteria pollutants. Grading also generates a substantial amount of $PM_{10}$ while emissions from employee travel, import/export activities, and demolition are secondary. CO, reactive organic gases (ROG), $NO_X$, and $PM_{10}$ emissions exceed the SCAQMD criteria thresholds (Table 2.5-6). The greatest levels of air pollution emissions occur during peak periods of construction, which is most likely when demolition, grading, and site preparation would be occurring simultaneously. Specifically, construction equipment produces most of the CO, ROG, $NO_X$, sulfur oxide ($SO_X$), and $PM_{10}$ emissions. Grading also generates a substantial amount of $PM_{10}$. For the Preferred Alternative, the peak $PM_{10}$ emissions (672 pounds per day) are minor compared to the total average annual of 416 tons per day (832,000 pounds per day) of particulate matter currently released in the whole SCAB.

The emissions generated by the construction of the Preferred Alternative are projected to exceed the SCAQMD criteria for all pollutants. The criteria are intended to be set at the lowest levels for which

air quality impacts may occur. The fact that they are projected to exceed the criteria implies that there will be increases in the concentrations of these pollutants that would be measurable. For example, the State $PM_{10}$ standards are exceeded in the study area, and slight increases in the concentrations of $PM_{10}$ may occur. The federal $PM_{10}$ standard is not exceeded in the area, and it is not anticipated that the quantities of pollutants released would be so great as to cause a violation of the federal standards. The increases would be localized in connection with the construction activities, and would be temporary.

### Table 2.5-6: Construction Emissions (Pounds/Day) – Preferred Alternative

| | | CO | ROG | $NO_X$ | $SO_X$ | $PM_{10}$ |
|---|---|---|---|---|---|---|
| 1 | Construction Equipment | 27,432.0 | 1,176.3 | 5,982.4 | 479.0 | 672.1 |
| 2 | Employee Travel | 435.8 | 28.5 | 54.0 | 3.4 | 2.8 |
| 3 | Grading ($PM_{10}$) | - | - | - | - | 330.0 |
| 4 | Import/Export ($PM_{10}$) | - | - | - | - | 1.5 |
| 5 | Demolition Debris | - | - | - | - | - |
| | **TOTAL:** | **27,868** | **1,205** | **6,036** | **482** | **1,006** |
| | **Significance Thresholds (pounds/day)** | | | | | |
| *Pounds per Day* | | *550* | *75* | *100* | *150* | *150* |

Source: Mestre Greve Associates (2003).
Note: The bold data indicate exceedance of the significance thresholds. The Preferred Alternative would require additional grading, but will not result in a new significant impact for construction air quality emissions.

### Long-Term Impacts Related to Air Quality.

**Regional and Subregional Air Quality Impacts.** Subregional emission changes are provided for the Preferred Alternative. The analysis examines the change in roadway network emissions. The roadway network does not extend through the entire SCAB and SDAB, but rather only a portion or subregion of those basins. Therefore, these changes in emissions can be characterized as subregional emissions because they are based on a subregion of the air basins. However, the traffic network extends out far enough so that changes in traffic patterns are miniscule outside of the traffic network; therefore, the subregional changes in emissions also represent the change in regional emissions. Since "regional" emissions is the more common term, we have used this term instead of the more cumbersome phrase of "subregional and regional" emissions throughout the following sections.

The regional and subregional analyses focus on the primary pollutants of hydrocarbons (HC), $NO_X$, $PM_{10}$, and CO. In recent years, diesel soot has been identified as a carcinogenic compound. However, the tools to evaluate concentrations of diesel soot simply are not available at this time, and no AAQS for diesel soot have been set by any regulatory agency. The best indicators at this time are the HC and $PM_{10}$ emissions. Therefore, the trends that are indicated in the following analyses for HC and $PM_{10}$ would also be indicative of the trends for diesel soot.

Since the publication of the Draft EIS/SEIR, new conformity regulations for 8-hour $PM_{2.5}$ were published on July 1, 2004. A $PM_{2.5}$ Hot Spot Final Rule was issued in March 2006. The Rule requires qualitative analyses for projects that meet the definition of a "project of air quality concern."

Regional and subregional impacts were assessed for a number of scenarios, based on different assumptions with respect to future land use development and circulation system improvements. The purpose of analyzing multiple scenarios for the Preferred Alternative is to provide an understanding of how, in general, regional air quality responds to the Preferred Alternative under different development conditions and to identify how the impacts of the Preferred Alternative vary under different future scenarios. Impacts were assessed for the Rancho Mission Viejo (RMV) project, which is being developed at 14,000 dwelling units (dus). In addition, both a committed road network and a build out (Master Plan of Arterial Highways [MPAH]/RTP) road network were considered.

Table 2.5-7 presents the emissions for the Preferred Alternative in comparison with existing emissions. The amount of HC, CO, and $NO_X$ emissions decrease dramatically in future years. HC emissions will be over 40,800 kilograms per day (kg/d) (90,000 pounds per day [lbs/d]) less in 2008 than with existing conditions. By 2025, the reduction in emissions over current conditions will be over 73,853 kg/d (162,819 lbs/d) of HC. Reductions in CO by 2025 will be well over 1.3 million kg/d (2.9 million lbs/d), and $NO_X$ will be reduced by approximately 418,000 kg/d (922,000 lbs/d).

$PM_{10}$ regional emissions are not anticipated to decrease as substantially in future years. In fact, after initial decreases in 2008 and 2025, the $PM_{10}$ emission levels by 2025 will actually be 4,378 kg/day (9,653 lbs/day) higher than for existing conditions.

**Table 2.5-7: Traffic Emission Changes for the Preferred Alternative in Comparison to Existing Emissions**

| Pollutant | Units | Preferred Alternative Versus Existing | |
|---|---|---|---|
| | | Year 2025; Committed; RMV @ 14,000 du | Year 2025; MPAH/RTP; RMV @ 14,000 du |
| HC | kg/day | -73,903 | -73,902 |
| | lbs/day | -162,928 | -162,925 |
| CO | kg/day | -1,327,559 | -1,327,576 |
| | lbs/day | -2,926,768 | -2,926,806 |
| $NO_X$ | kg/day | -418,171 | -418,151 |
| | lbs/day | -921,911 | -921,865 |
| $PM_{10}$ | kg/day | **4,361** | **4,361** |
| | lbs/day | **9,614** | **9,613** |

Source: Mestre Greve Associates (2003).
Note: Values in bold exceed SCAQMD threshold.
kg = kilograms
lbs = pounds

The changes in regional emissions in the future with the Preferred Alternative and without are presented in Table 2.5-8. The changes in emissions represent the difference in emissions that would result with this Alternative in comparison to the corresponding No Action Alternative.

**Table 2.5-8: Regional Traffic Emission Changes for the Preferred Alternatives in Comparison to the Corresponding No Action Alternatives**

| Pollutant | Units | Year 2025; Committed; RMV @ 14,000 du | Year 2025; MPAH/RTP; RMV @ 14,000 du |
|---|---|---|---|
| HC | kg/day | -34 | -26 |
| | lbs/day | -75 | -58 |
| CO | kg/day | -1150 | -800 |
| | lbs/day | -2536 | -1764 |
| $NO_X$ | kg/day | **68** | **35** |
| | lbs/day | **149** | **78** |
| $PM_{10}$ | kg/day | 3 | 1 |
| | lbs/day | 6 | 1 |

Source: Mestre Greve Associates (2003).
Note: Values in bold exceed SCAQMD threshold.
kg = kilograms
lbs = pounds

The Preferred Alternative exceeds the SCAQMD criteria thresholds for $NO_X$, but does not exceed the thresholds for HC, CO, and $PM_{10}$. Both HC and $PM_{10}$ are regional pollutants of concern, and neither is forecast to increase substantially. The Preferred Alternative results in a substantial decrease in CO. HC emissions are projected to decrease for the Preferred Alternative in comparison to the No Action Alternatives. $PM_{10}$ emissions are projected to remain essentially the same in comparison to the No Action Alternatives.

For the Preferred Alternative, both a committed road network and a build out (MPAH/RTP) road network were considered. Increases of regional $NO_X$, $O_X$, and CO emissions were less with the build out network than with the committed network. With the committed network, slightly more cars are moved from the arterial roads to the Preferred Alternatives, which results in higher emissions.

Table 2.5-9 presents the result of analyses further examining the conditions in the interim years for the Preferred Alternative. Changes in emissions in comparison to the corresponding No Action Alternatives are presented for 2008 (opening year), 2018, and 2025. Future $NO_X$ emissions increase in comparison to the No Action Alternatives and the increases substantially exceed SCAQMD thresholds for all years. Emissions of HC and CO are substantially less for all years than the No Action Alternatives. $PM_{10}$ emissions are about the same with or without the project. As discussed previously, the $NO_X$ emissions are higher and HC and CO emissions are lower because with implementation of the corridor, more vehicles will be traveling at high speeds.

**Table 2.5-9: Regional Traffic Emission Changes for the Preferred Alternative for Intermediate Years**

| Pollutant | Units | Year 2008; Committed Network | Year 2018; Committed Network |
|---|---|---|---|
| HC | kg/day | 2 | -34 |
| | lbs/day | 4 | -76 |
| CO | kg/day | -118 | -432 |
| | lbs/day | -261 | -952 |
| $NO_X$ | kg/day | **194** | **153** |
| | lbs/day | **429** | **337** |
| $PM_{10}$ | kg/day | -1 | -6 |
| | lbs/day | -1 | -14 |

Source: Mestre Greve Associates (2003).
Note: Values in bold exceed SCAQMD threshold.
kg = kilograms
lbs = pounds

In summary, the regional traffic emissions will decrease substantially in future years. The reduction in emissions will occur with or without implementation of the Preferred Alternative. The decrease will be due to the use of cleaner vehicles in future years, which is mandated by State and federal laws. In comparison to the No Action Alternatives, the Preferred Alternative will result in increases in $NO_X$ emissions, a decrease in HC and CO emissions, and essentially no change in $PM_{10}$ emissions. The Preferred Alternative results in more vehicles traveling at a higher speed than with the corresponding No Action Alternatives. More travel at higher speeds is primarily responsible for the increase in $NO_X$ emissions and the decreases in HC and CO emissions.

**Local Air Quality Impacts.** Because the Preferred Alternative will change the traffic pattern of the road system in south Orange County, detailed analysis of CO concentrations at sensitive areas in the project vicinity was conducted. The Preferred Alternative has the potential to alter traffic patterns on arterial roads as well as adding a new source of air pollutants. Therefore, both concentrations at key arterial intersections as well as concentrations along the corridor alignments were investigated. The intersections identified for CO analysis are located outside the coastal zone.

The results of the CO modeling are summarized in Table 2.5-10 for 1-hour and 8-hour concentrations for CO. The pollutant levels are expressed in ppm for CO. The CO level is a composite of the background levels of CO coming into the area plus those generated by the local roads.

For the CO concentration levels, the pollutant levels are projected to comply with the State and federal CO AAQS for both 1-hour and 8-hour timeframes at all receptor locations for the Preferred Alternative.

The existing CO levels are the highest at Intersections 1, 2, 4, 6, 8, 10, and 11, as most of these are adjacent to I-5. This is mainly due to the higher existing background CO concentration levels and emission factors. The amount of existing traffic is actually lower than the two future Alternatives but is offset by the higher existing background CO and emission rates. In contrast, the existing CO levels are lowest at Intersections 3, 7, 9, and 12. This is indicative of the lower existing local traffic conditions in these areas when compared to the future Alternatives. Of the two future Alternatives, the 2025 No Action Alternative's CO concentration levels are slightly higher than the 2025 Preferred Alternative's CO concentration levels. This is a result of the higher amount of traffic and slightly worse congestion levels associated with the 2025 No Action Alternative. However, the 2025 Preferred Alternative shows overall improvement in CO concentration levels when compared to the 2025 No Action Alternative. That is, lower CO levels will result at most of these intersections. This is due to lower peak-hour traffic and reduced congestion levels associated with the 2025 Preferred Alternative. The 2025 No Action Alternative CO levels are the highest and represent the worst-case Alternative.

**Table 2.5-10: Preferred Alternative CO Projections for 2025 (MPAH Network, OCP-2000 with Build Out Toll Network with 21,000 RMV du[1])**

| Site | Intersection | Carbon Monoxide | | |
|---|---|---|---|---|
| | | Existing | No Action | Preferred Alternative |
| 1 | I-5/Alicia Parkway | 8.5 / 6.5 | 5.6 / 4.1 | 5.3 / 3.9 |
| 2 | Felipe/Oso Parkway | 8.0 / 5.7 | 8.0 / 5.6 | 8.0 / 5.6 |
| 3 | Antonio Pkwy./Oso Pkwy. | 6.2 / 4.4 | 6.9 / 4.8 | 6.6 / 4.6 |
| 4 | SR-241/Oso Parkway | 4.9 / 3.6 | 3.7 / 2.6 | 3.6 / 2.5 |
| 5 | Crown Valley/Marguerite | 8.6 / 6.1 | 12.0 / 8.4 | 8.0 / 5.6 |
| 6 | I-5/Ortega Highway | 7.6 / 5.7 | 6.0 / 4.5 | 5.0 / 3.7 |
| 7 | Antonio Pkwy./Ortega Hwy. | 5.5 / 3.9 | 6.9 / 4.8 | 6.9 / 4.8 |
| 8 | I-5/Vista Hermosa | 5.7 / 4.2 | 4.9 / 3.6 | 4.7 / 3.4 |
| 9 | Ave. Pico/La Pata | 4.7 / 3.4 | 6.3 / 4.4 | 5.0 / 3.5 |
| 10 | I-5/El Camino Real | 6.5 / 4.9 | 5.4 / 4.0 | 5.0 / 3.7 |
| 11 | I-5/Ave. Pico | 9.1 / 6.9 | 6.2 / 4.6 | 5.6 / 4.1 |
| 12 | Antonio Pkwy./Crown Valley | 5.1 / 3.7 | 6.9 / 5.2 | 6.7 / 4.7 |
| 13 | Vista Hermosa/La Pata | - | 5.3 / 3.7 | - |
| 14 | SR-241/Ave. Pico | - | - | 4.3 / 3.1 |
| **State Standards:** | | 20 ppm/ 9 ppm | 20 ppm/ 9 ppm | 20 ppm/ 9 ppm |
| **No. of Exceedances** | | 0 / 0 | 0 / 0 | 0 / 0 |
| **Federal Standards:** | | 35 ppm/ 9 ppm | 35 ppm/ 9 ppm | 35 ppm/ 9 ppm |
| **No. of Exceedances** | | 0 / 0 | 0 / 0 | 0 / 0 |

Source: Mestre Greve Associates (2003).
[1]The CO analysis assumed a greater RMV density (21,000) than is currently approved (14,000).

du = dwelling units

For comparison purposes, two special scenarios, opening year 2008 and the 10-year increment 2018 with and without the project, were analyzed for the worst-case intersection. The worst-case

intersection has the highest level of CO concentration for the 2025 Preferred Alternative. The worst-case intersection is Crown Valley Parkway/Marguerite (Site 5). The CO modeling results are shown in Table 2.5-11.

**Table 2.5-11: CO (ppm) Projections for the 2025 Preferred Alternative Versus Interim Year Alternatives**

| | | Interim Years | | | | 2025 |
|---|---|---|---|---|---|---|
| | | 2008 | | 2018 | | |
| Site | Intersection | No Action 1-hr/8-hr | Preferred Alternative 1-hr/8-hr | No Action 1-hr/8-hr | Preferred Alternative 1-hr/8-hr | Preferred Alternative 1-hr/8-hr |
| 5 | Crown Valley/Marguerite | 7.1 / 5.0 | 6.2 / 4.4 | 8.2 / 5.7 | 8.0 / 5.6 | 8.0 / 5.6 |

Source: Mestre Greve Associates (2003).
ppm = parts per million

The CO concentration levels for the 2008 Preferred Alternative are the lowest, while the 2025 Preferred Alternative are the highest. The emission factors are gradually decreasing, and the traffic levels are gradually increasing over this time period. Since the highest concentration occurs in 2025, this is clearly the worst-case year. The 2008 CO levels with and without the project are the same; however, the CO levels for the 2018 Preferred Alternative are slightly less than the 2018 No Action Alternative. This is a result of the lower traffic and congestion level for the 2018 Preferred Alternatives, which result in better CO concentration levels. The CO concentration levels for the 2018 Preferred Alternative are similar to the build out 2025 Preferred Alternative. Overall, the 2018 No Action Alternative results in the highest CO levels and represents the worst-case Alternative.

The reconfiguration of MCB Camp Pendleton gate access at Basilone Road is the result of more stringent Homeland Security requirements in the aftermath of the events of September 11, 2001. While the new requirements may result in greater delays at the gate, the provision of additional parking area is expected to minimize the need for idling and associated CO emissions. No CO exceedances are anticipated to occur at this location.

**Qualitative $PM_{10}$ Analysis.** According to FHWA guidance related to projects that increase the vehicle miles traveled (VMT) and reduce idling time, elevated VMT does increase the tailpipe emissions; tire wear emissions, and the paved road dust (also referred to as re-entrained particulate matter). However, these emissions of $PM_{10}$ are generally spread out along the entire roadway network and are not concentrated in any one area. Hot spots or high levels of local pollutant concentrations generally occur at congested intersections, where a large number of vehicles may sit and idle or move slowly, resulting in a larger amount of emissions being released within a small area. Therefore, to reduce the severity of hot spot conditions, it is most important to reduce the level of congestion, particularly on the arterial roadway network.

The traffic study was consulted to determine the potential impact of the project Alternatives on $PM_{10}$ hot spots. Both the changes in regional VMT and the changes in arterial roadway traffic were considered. A preliminary analysis indicated that the build out roadway network (as

opposed to the committed network) was worst-case for 2025. The Preferred Alternative will increase the regional VMT by 23,413 and decrease the arterial VMT by 400,003. Although small increases in regional VMT would occur with the project, much larger and more critically located traffic would be reduced on the arterial roadways. Therefore, the qualitative analysis for $PM_{10}$ indicates that the Preferred Alternative would also result in a reduction in the number and severity of $PM_{10}$ hot spots.

**Qualitative $PM_{2.5}$ Analysis.** Since the publication of the Draft EIS/SEIR, new conformity regulations for 8-hour $PM_{2.5}$ were published on July 1, 2004. A $PM_{2.5}$ Hot Spot Final Rule was issued in March 2006. The Rule requires qualitative analyses for projects that meet the definition of a "project of air quality concern." Future new or worsened $PM_{2.5}$ violations of any standard are not anticipated as a result of the Preferred Alternative for several reasons. First, the proposed project has been on regional transportation plans for 30 years and is reflected in the Air Quality Management District (AQMD) air quality modeling efforts for the region. Second, the project does not qualify as a project of air quality concern as defined by the new $PM_{2.5}$ Hot Spot Rule because the percentage of the total truck traffic that is anticipated to be diesel trucks is less than 4 percent, compared with the 8 percent diesel truck traffic component indicated in the Final Rule. Third, the existing ambient concentrations of $PM_{2.5}$ are well below the established thresholds. Therefore, it is very unlikely that the project's contributions would create a new, or worsen an existing, $PM_{2.5}$ violation.

**Air Toxins.** In addition to the NAAQS set forth by EPA for the six criteria pollutants, EPA has also established a list of 33 urban air toxics. Urban air toxics, also known as hazardous air pollutants, are those pollutants that cause or may cause cancer or other serious health effects or adverse environmental and ecological effects. Most air toxics originate from human-made sources, including road mobile sources (e.g., cars, trucks, buses), nonroad mobile sources (e.g., airplanes, lawnmowers, etc.) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., building materials). Some air toxics are also released from natural sources such as volcanic eruptions and forest fires.

These pollutants are in the atmosphere as a result of our industrialized society, but science has been providing more evidence about the risks they pose to human health. The health risks for people exposed to urban air toxics at sufficiently high concentrations or lengthy durations include an increased risk for getting cancer or experiencing other serious health effects. These health effects can include damage to the immune system, as well as neurological, reproductive, developmental, respiratory, and other health problems.

To better understand the harmful effects that road sources of urban air toxics have on human health, in 1996 the EPA developed a list of 22 mobile source air toxics (MSAT) such as acetaldehyde, benzene, formaldehyde, diesel exhaust, acrolein, and 1,3-butadiene, and assessed the risks of various kinds of exposures to these pollutants on human health. In July 1999, the EPA published a strategy to reduce urban air toxics. The EPA has not yet determined how best to evaluate the impact of future roads and intersections on the ambient concentrations of urban air toxics. There are no standards for mobile source air toxics, and there are no tools to determine the significance of localized concentrations or of increases or decreases in emissions. Without the

necessary standards and tools, FHWA believes that it cannot analyze the specific impacts of roadway projects in any meaningful way.

While there are currently no quantitative tools to assess the project's air toxics impact, potential impacts from the project can be assessed by qualitatively comparing the build scenario to the no-build scenario. The project would not cause any additional negative air toxics impact, based on the following comparisons:

a. There will not be any substantial increase in diesel truck traffic for the Preferred Alternative compared to the No Action Alternative.

b. The Preferred Alternative would reduce congestion levels and stop-and-go conditions and change them into more free-flow conditions; therefore, the acceleration events that cause the highest per-vehicle exhaust emissions should decrease.

The FHWA issued interim guidance regarding MSATs in February 2006. The Guidance was reviewed in the context of the SOCTIIP planning effort and, specifically, the Preferred Alternative. The review of the MSAT Guidance indicated that the amount of MSATs emitted would be proportional to the VMT. This is because other potential variables, such as fleet mix, are essentially the same for each Alternative.

The SOCTIIP traffic study indicates that, while the Preferred Alternative will result in a very small increase in regional VMT (i.e., 23,413 additional vehicle miles per day in comparison to the 421,712,541 miles projected for the region), it will result in a substantial reduction in arterial VMT (i.e., 400,003 miles per day). The reduction in vehicle emissions by reducing traffic on the arterial road network will be more than 25 times as great as the increase in vehicle emissions due to overall regional traffic increase. More importantly, traffic will be removed from arterial road intersections where congestion leads to greater MSAT emissions. Therefore, this qualitative analysis indicates that the Preferred Alternative would provide a reduction in MSAT emissions concentrations.

Also, future emissions will likely be lower than present as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

## Impacts in Coastal Zone

Due to the nature of air quality, short-term construction and long-term operational impacts to the Coastal Zone cannot be differentiated from impacts resulting from construction and operation of the entire Preferred Alternative. However, the emission rates presented in Table 2.5-6 are similar to those that would result from construction activities within the Coastal Zone. The air quality impacts to the Coastal Zone will only occur for the duration of construction activities in the Coastal Zone.

## 2.5.4 MITIGATION

The following mitigation measures, as included in the certified Final SEIR, were developed to avoid or minimize the impacts of the Preferred Alternative related to air quality as much as possible and are applicable for short-term construction activities and long-term operations within the Coastal Zone. The mitigation measures are also included in the Mitigation Monitoring and Reporting Program in Appendix A of this document.

### Mitigation Measures for Short-term Impacts

### Particulate Emission ($PM_{10}$) Control

**AQ-1** During construction, contractor specifications shall incorporate directions to contractors to control fugitive dust. Fugitive dust shall be controlled by regular watering, paving construction roads, or other dust preventive measures, as defined in SCQAMD Rule 403.

After clearing, grading, earthmoving, or excavation, the following activities will be performed by the construction contractor:

a. Seeding and watering will be performed until viable vegetation cover is in place in inactive areas.

b. Soil binders will be spread.

c. Areas will be wet down sufficiently to form a crust on the surface. Repeated soakings will be performed as necessary to maintain this crust.

d. Reduce speeds to 10 to 15 mph in construction zones on unpaved areas.

**AQ-2** During construction, measures contained in Tables 1 and 2 of SCAQMD Rule 403 will be implemented by the construction contractor. Control of particulate emissions from construction activities is best controlled through the requirements contained in SCAQMD's Rule 403, Tables 1 and 2 *(refers to Tables 4.7-60 and 4.7-61 in the Final SEIR)*. The measures contained in these tables are presented as an option to air quality monitoring in Rule 403. Table 4.7-60 contains measures such as maintaining an adequate moisture content in the soil, watering grading areas, establishing ground cover in inactive areas and watering unpaved roads. Table 4.7-61 identifies additional measures that are applied during high wind conditions. The mitigation measure, therefore, is to require that the measures contained in Tables 1 and 2 of Rule 403 *(Tables 4.7-60 and 4.7-61 in the Final SEIR)* be utilized. This potentially results in a much higher reduction of particulate emissions than if the air monitoring option contained in Rule 403 were employed. The air monitoring option requires monitoring around the project site, and as long as pollutant levels do not exceed threshold limits, no pollutant emission reduction measures are employed. The measure would be triggered prior to the initiation of grading.

**AQ-3** During construction, the contractor shall be responsible for sweeping all public streets adjacent to the project site once a day if visible soil materials are carried to adjacent streets

(recommend water sweepers with reclaimed water). This condition would apply to those areas where construction traffic leaves the project site and travels onto public roadways.

**AQ-4** During construction, the contractor shall be responsible for installing wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash trucks and any equipment leaving the site each trip.

**Construction Equipment Emission Control.** Emissions generated by construction equipment will exceed SCAQMD thresholds. The generation of these emissions is almost entirely due to engine combustion in construction equipment and employee commuting. The measures below address these emissions.

**AQ-5** During final design, contractor specifications shall require that contractors implement the following measures:

- Use low-emission mobile construction equipment.
- Maintain construction equipment engines by keeping them tuned.
- Use low-sulfur fuel for stationary construction equipment. This is required by SCAQMD Rules 431.1 and 431.2.
- Utilize existing power sources (i.e., power poles) when feasible. This measure would minimize the use of higher polluting gas or diesel generators.
- Configure construction parking to minimize traffic interference.
- Minimize obstruction of through-traffic lanes. When feasible, construction should be planned so that lane closures on existing streets are kept to a minimum.
- Schedule construction operations affecting traffic for off-peak hours.
- Develop a traffic plan to minimize traffic flow interference from construction activities (the plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service).
- Include in construction grading plans a statement that work crews shut off equipment when not in use.
- Support and encourage ridesharing and transit incentives for the construction crew.

**AQ-6** During construction, any material deposited onto paved roads due to a major storm event must be removed within 72 hours of the event by the contractor. Additional time is allowed for mudslides or similar events that block traffic over the material. In the event of road closures due to mudslides or other overwhelming accumulations of material, public access should be restricted until all the material is removed.

### Mitigation Measures for Long-term Impacts

**AQ-7** During construction, the contractor shall be responsible for implementing a control measure which specifies three "preventive" and one "mitigative" control option(s) that would be

mandatory of all unpaved road connections with paved public roads. The four mandatory control options include:

- Paving the last 100 feet from an unpaved roadway connection with a paved road;
- Chemical stabilization of the last 100 feet from an unpaved roadway connection with a paved road at sufficient frequency and concentration to maintain a stabilized surface at all times.
- Installation of dirt removal devices (e.g., tire cleaning device, grizzlies, etc.).
- Cleaning of public paved road surface at any time visible track-out occurs.

## 2.5.5 CONCLUSION

The Preferred Alternative will have significant adverse construction impacts associated with CO, HC, $NO_X$, and $PM_{10}$ emissions. In addition, the Preferred Alternative will have significant adverse operations impacts due to $NO_X$ that exceeds the SCAQMD thresholds. The short-term construction emissions as a result of the Preferred Alternative with mitigation measures will be substantially reduced but cannot be mitigated to below a level of significance.

Long-term regional air quality emissions decrease from existing conditions with or without implementation of the Preferred Alternative. The amount of HC, CO, and $NO_X$ emissions decrease in future years compared to existing conditions. $PM_{10}$ emissions increase in future years compared with existing conditions, although during intervening years, prior to 2025, the emissions are reduced. Overall, regional air quality indicated by traffic emissions will be better in future years compared to existing conditions.

The long-term regional air quality impact as a result of the Preferred Alternative with mitigation measures will be reduced; however, there remains a significant adverse impact for $NO_X$ emissions, as $NO_X$ emissions exceed significance thresholds.

Air quality effects in the Coastal Zone cannot be differentiated from the effects of the proposed project overall due to the nature of air emissions and dispersion. The proposed project will result in substantial reduction in congestion at I-5 near the County line. For example, travel times to and from southern Orange County will be reduced by 5 to 10 minutes or 18 to 27 percent, travel times to and from northern Orange County will be reduced by 8 to 12 minutes or 10 to 16 percent, and travel times to and from areas beyond Orange County will be reduced by 11 to 17 minutes or 5 to 13 percent. Reduced congestion is expected to result in reduced idling emissions in the Coastal Zone at the I-5 FTC-S confluence.

# 2.6 WATER QUALITY

## 2.6.1 INTRODUCTION

The proposed alignment of the Foothill Transportation Corridor-South (FTC-S) State Route 241 (SR-241) crosses San Mateo Creek just upstream of the existing Interstate 5 (I-5) bridge crossings. To the south, the SR-241 alignment merges with I-5 at the San Onofre Creek crossing. Initial proposed improvements include the widening of the I-5 bridge at San Onofre Creek and construction of two parallel flyover ramps crossing San Mateo Creek (approximately 200 feet [ft] upstream of the I-5 bridges). Figure 2.6-1 presents the proposed alignment within the watersheds. In the Coastal Zone, the project will also include construction of two extended detention basins (EDBs) and one bioswale for treatment of freeway storm water generated from I-5 and SR-241. Approximately 2 miles (mi) of existing I-5 will be retrofitted for storm water treatment as part of the project.

The primary technical document supporting surface water quality for the Final Subsequent Environmental Impact Report (SEIR) was the Runoff Management Plan (RMP), completed in December 2003. One of the primary objectives of the RMP was to develop mitigation for the purpose of maintaining peak flow velocities downstream of the project at or below existing rates and preventing project pollutants from reaching improved and unimproved downstream drainages both during construction and subsequent operation of the corridor.

## 2.6.2 SETTING

### Major Watersheds

The receiving waters in the vicinity of the Coastal Zone for this project are San Mateo Creek and San Onofre Creek, which discharge into the Pacific Ocean. The Hydrologic Area (HA) within the limits of this project contributing to San Mateo Creek is San Mateo Canyon (HA 1.40). The Hydrologic Sub-Area (HSA) within the limits of this project contributing to San Onofre Creek is San Onofre Valley (HSA 1.51). The approximate distances from the project's outfalls to the receiving creeks vary as follows: (1) San Mateo Creek: 0–650 ft, and (2) San Onofre Creek: 0–10 ft. Figure 2.6-1 presents a detailed alignment of the project within these watersheds.

**San Onofre Watershed.** The San Onofre Creek watershed covers nearly 43 square miles (sq mi) and is located entirely in San Diego County. It drains the east side of the Santa Margarita Mountains in the Cleveland National Forest, with the Marine Corps Base (MCB) Camp Pendleton occupying nearly the entire watershed. The land use within the project watershed is largely undeveloped under federal control (military and forest use), and the majority of the terrain is currently brush covered or orchard where the MCB military training takes place. There is a little commercial and residential development within the watershed near the ocean. The watershed is mostly located within MCB Camp Pendleton in an unincorporated area of San Diego County, near the Orange/San Diego County boundary.

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FIGURE 2.6-1

*Foothill Transportation Corridor – South*

Watershed Map Within Project Limits

The mouth of the creek is located at the Pacific Ocean, approximately 900 ft south of I-5. A temporary pond is formed here by the deposit of beach sand. During major storm events, the sand mounds are overtopped and washed away. SR-241 connects to I-5 at the San Onofre Creek crossing (Figure 2.6-2). This area is heavily vegetated with riparian woodland and coastal weeds. Further upstream, the creek turns right sharply and crosses Beach Club Road as a low-flow crossing. Upstream of the crossing, a significant amount of coarse material has settled and the natural channel is characterized by medium dense vegetation with a much wider floodplain.

**San Mateo Watershed.** The San Mateo Creek in the vicinity of the project is located within the Marine Corps Base (MCB) Camp Pendleton. The creek consists mostly of alluvial terraces with a wide braided channel and a floodplain up to 850 feet wide. Downstream of the existing I-5 bridges, the floodplain is open space with a blind estuary/lagoon protected from the Pacific Ocean by a sandbar located at the mouth of San Mateo Creek. The estuary contains dense wetland vegetation and is breached only after heavy storms. The lagoon extends upstream from Trestles beach approximately 1,800 ft. The vegetation within the channel upstream of the lagoon is medium to dense brush with some trees. Upstream of the existing I-5 Bridges, vegetation in the main channel is medium to dense brush with some medium to tall trees. In the floodplain upstream of I-5 and south of San Mateo Creek, vegetation consists largely of agricultural fields previously leased from MCB Camp Pendleton. Many of these fields have been fallow, resulting in coverage of low-lying brush and grasses. The San Mateo Creek watershed covers approximately 133 square miles in Orange, Riverside, and San Diego Counties. The proposed San Mateo Bridge is located in San Diego County. The watershed drains the southern side of the Santa Ana Mountains and the eastern side of the Elsinore Mountains. Approximately 14 percent of the watershed is located in Orange County, and the remainder of the watershed area is located in Riverside County (50 percent) and San Diego County (36 percent).

## Hydrologic Characteristics

The project site has a Mediterranean-type climate characterized by long, dry summers and mild winters. The average annual precipitation is approximately 13 inches but increases to 18 inches in the higher elevations. Most of the precipitation occurs during the period from November through March, with little or no rainfall from May through October. Three types of storms produce precipitation in the area: general winter storms, thunderstorms, and tropical cyclones. Flooding is most often caused by high intensity rainfall associated with general winter storms. Flooding can rise from a dry streambed to flood stage in a matter of hours.

Soil groups within the project area have been mapped and classified according to criteria set forth by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS, formerly known as the Soil Conservation Survey). Based upon these criteria, soils are further classified into four hydrological soil groups: A, B, C, and D, where A is the most pervious with low runoff potential (such as sand and gravel), and D is the least pervious with high runoff potential (such as clay soils). Project area soils within the Coastal Zone include types B, C, and D, with type B generally following the alluvial deposits along the creeks and types C and D generally located along the hillsides.

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FIGURE 2.6-2

*Foothill Transportation Corridor - South*

I-5 Bridge Structures over San Onofre Creek

I:\TCA531\Coastal Zone Analysis\Fig 2.6-2.cdr (3/19/07)

LSA

FIGURE 2.6-3

*Foothill Transportation Corridor - South*

I-5 Bridge Structures over San Mateo Creek

I:\TCA531\Coastal Zone Analysis\Fig 2.6-3.cdr (3/19/07)

The land within the project watershed is largely undeveloped, and the majority of the terrain is currently brush covered or agricultural. Most of the land in the project watershed is designated as "open space."

## Floodplains

The floodplains within the project area Coastal Zone include those associated with San Onofre Creek and San Mateo Creek. In general, the project would result in a minor increase in impervious surface in the watersheds for these creeks (see Figure 2.6-1). This can be expected to translate into minor localized increases in runoff. However, lag time between the peak runoff of these major streams and that from the freeway runoff is large (i.e., the peak flow from the freeway will have substantially subsided by the time the watershed peak occurs). This, coupled with the minor increase in impervious surface (approximately 0.2 percent of the San Mateo Creek watershed and less than 0.1 percent of the San Onofre Creek watershed), results in an insignificant increase in peak flows found in San Onofre and San Mateo Creeks. The following provides a description of the floodplains along with existing and proposed bridge structures traversing the floodplains.

**San Onofre Floodplain.** The existing San Onofre Creek crossing at I-5 consists of two separate structures (left and right) carrying southbound and northbound traffic. The floodplain in this vicinity extends over the main stream channel and is contained within the high channel banks and bridge abutments. The flood flow depths and velocities range from 13.0–14.4 and 4.0–6.3 ft per second, respectively. Each existing structure consists of a four-span concrete box girder bridge supported by two abutments and three piers and are 354 ft long and 68 ft wide, crossing the creek at a skew angle of 10 degrees. The foundation system consists of driven steel piles. Pier walls are 2 ft thick and aligned with the direction of creek flow. The embankment fills at abutments vary from 30–40 ft in height.

Proposed improvements consist of widening the existing structure on both the upstream (northbound) side (from 42.5 ft to 52.0 ft) and downstream (southbound) side (from 37.0 ft to 52.7 ft). The widened structure would be constructed on pier walls similar to the existing structure, with the same 2 ft width as the existing pier walls. The proposed widening creates an increase in water surface of 0.6 ft at the upstream face of the proposed bridge widening. The increase diminishes to zero approximately 66 ft upstream of the bridge. Therefore, the water surface impacts are considered minor and within the Federal Emergency Management Administration (FEMA) guidelines.

**San Mateo Floodplain.** The existing San Mateo Creek crossing of I-5 consists of two parallel five-span reinforced concrete box girder bridges supported on pile-supported reinforced concrete pier walls. The northbound and southbound structures are symmetrical. The floodplain in this vicinity extends over the main stream channel and is contained within the high channel banks and bridge abutments. In general, the floodplain is wide upstream and downstream of the I-5 bridge structures and contracts at the bridge crossings. Flood flow depths in San Mateo Creek range from 14.8–16.2 ft, and flow velocities range from 12–14 feet per second (fps). Each existing structure is 500 ft long and 68 ft wide. The four pier walls are 50 ft tall, 2 ft thick, and supported with a pile cap and piles. Each footing is 16 ft wide and approximately 69 ft long, and supported by a foundation constructed of 12 3 ft diameter cast-in-drilled-hole (CIDH) piles.

Improvements include construction of two connector bridges to SR-241 over San Mateo Creek, upstream of the I-5 bridge structures. The northbound connector is a 3,860 ft long, cast-in-place, prestressed concrete box girder bridge. It will be supported by 15 single-column piers between the abutments. The pier spacing is approximately 250 ft on average through San Mateo Creek. The bridge crosses San Mateo Creek at a skew angle ranging from 45 degrees at the creek crossing to approximately 70 degrees near the north abutment. The southbound connector is a 3,910 ft long, cast-in-place, prestressed concrete box girder bridge. It is supported by 12 single-column piers and two outriggers between the abutments. The piers are spaced approximately 270 ft on average through San Mateo Creek. The bridge crosses San Mateo Creek at a skew angle ranging from 60 degrees at the creek crossing centerline to approximately 70 degrees near the north abutment. In the vicinity of the proposed bridge crossings, flow depths in the main channel range from 15.6–16.8 ft, and flow velocities range from 12–14 fps. The proposed bridges will result in a maximum increase in water surface elevation of 0.4 ft upstream of the existing I-5 bridge structures. The increase in water surface elevation diminishes to zero approximately 0.75 mi upstream of the bridge structures. Therefore, the water surface impacts are relatively minor.

## 2.6.3 REGULATORY SETTING

### Regional Water Quality Control Board

The proposed project is located within the jurisdiction of the San Diego Regional Water Quality Control Board (RWQCB). Regulations for discharges within this area are included in the Water Quality Control Plan for the San Diego Basin (September 1994). Section 401 of the Clean Water Act is administered locally by the San Diego RWQCB. This stipulates that any action that requires a federal license or permit and that may result in a discharge of pollutants into waters of the U.S. also requires water quality certification. It is designed to ensure that the discharge will comply with applicable federal and State effluent limitations and water quality standards. Waters of the United States (WoUS) within the Coastal Zone for this project include San Onofre and San Mateo Creeks. Section 402(p) of the Water Quality Protection Act of 1987 requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for construction projects that disturb more than 1 acre of land as part of the National Pollutant Discharge Elimination System (NPDES). In California, the State Water Resources Control Board (SWRCB) is responsible for implementing this requirement through the RWQCB and California Department of Transportation (Caltrans).

### California State Department of Fish and Game

Section 1602 of the California State Department of Fish and Game Code requires a Streambed Alteration Agreement for any alteration to the bank or bed of a stream or lake. Streams within the Coastal Zone include San Onofre Creek and San Mateo Creek.

### United States Army Corps of Engineers

Section 404 of the Clean Water Act requires a "Section 404 Permit" for the discharge of dredged or fill material into all WoUS. This permit is administered by the United States Army Corps of

Engineers (Corps). WoUS within the Coastal Zone for this project include San Onofre Creek and San Mateo Creek.

### Federal Emergency Management Administration

FEMA is responsible for oversight of floodplain impacts. A Floodplain Evaluation is required as described under the National Flood Insurance Program (23 CFR 650, Subpart A Section 650) for project work within the 100-year floodplain. Section 650.111 of the regulations calls for location hydraulic studies to be performed with detailed engineering design drawings. Hydraulic modeling is required along with a hydraulic report summarizing the results (to be submitted for review by the local agencies listed in the FEMA Flood Insurance Rate Maps [FIRMs]). A Conditional Letter of Map Revision (CLOMR) and a Letter of Map Revision (LOMR) may be required by FEMA for work within a floodway or for work resulting in significant impacts to the floodplain.

## 2.6.4 IMPACTS

### On-Site Runoff

#### Existing On-Site Drainage Conditions.

**I-5 and Connectors.** Current on-site drainage along I-5 in this area consists of a series of storm drains and inlets that outlet to longitudinal surface ditches draining directly to San Onofre and San Mateo Creeks without storm water treatment. Along I-5, Basilone Road marks the drainage area boundary between the storm drainage system that conveys flow southward to San Onofre Creek and the storm drainage system that conveys flow northward to San Mateo Creek.

**SR-241 and Cristianitos Road.** Along the existing Cristianitos Road, east of I-5, pavement drainage flows via sheet flow and overside drains to the adjacent hillside (north bank of San Mateo Creek). This runoff currently has no storm water pollution control facilities associated with it.

#### Proposed On-Site Drainage Conditions.

**I-5 and Connectors.** On-site drainage along I-5 from the north side of San Mateo Creek southward 2 mi will be retrofitted to provide stormwater treatment to on-site runoff. This will be accomplished by constructing storm drain systems along I-5 and along the proposed SR-241/I-5 connectors that will tie into the existing storm drains. The storm drain improvements will convey storm water to extended detention basins adjacent to San Onofre and San Mateo Creeks.

The proposed on-site storm drain network along I-5 and along the SR-241 connectors consists of two systems that convey storm water to extended detention basins adjacent to San Onofre Creek (System 1) and San Mateo Creek (System 2). System 1 includes a storm drain system along I-5 from Basilone Road southward for approximately 1.5 mi. System 1 will convey flows to the east side of I-5 where it will connect to a 3.7 acre-foot extended detention basin (located at the south embankment of San Onofre Creek) for storm water treatment. The detention basin will outlet into a pipeline that routes the treated runoff to San Onofre Creek. For erosion control, the outlet will

consist of a 100-square-foot (sq ft) riprap energy dissipater located on the south embankment of San Onofre Creek.

The proposed on-site System 2 includes a storm drain system along I-5 from Basilone Road northward to San Mateo Creek. This system will convey flows to the east side of I-5 where it will connect to a 2.5 acre-foot extended detention basin (located on the south side of San Mateo Creek) for storm water treatment. The detention basin will outlet into a pipeline that routes the treated runoff to San Mateo Creek. For erosion control, the outlet will consist of a 100 sq ft riprap energy dissipater located on the south embankment of San Mateo Creek. System 2 will also include storm drains provided at the toe of embankment along the east side of I-5 to convey storm flow from the above-grade SR-241 connector structures. Deck drainage from these bridges will be routed down columns and will outlet to the System 2 storm drains. All System 2 storm drains will connect to the EDB prior to discharge into San Mateo Creek.

**SR-241 and Cristianitos Road.** On-site runoff for the area north of San Mateo Creek, at the Cristianitos Road crossing, will be conveyed to treatment Best Management Practices (BMPs) via storm drain systems equipped with flow splitters that capture and convey water quality flows to the BMPs and allow peak flows to continue on their original flow path. In this way, the on-site low flows and off-site flows are always separated. Treatment BMPs in this vicinity include a detention basin and a series of biofiltration swales.

Two storm drain systems (Systems 4 and 5) intercept and convey the on-site runoff in this area. System 4 includes a series of pipelines that direct flow from the shoulders into the median where a series of 300 ft long biofiltration swales will treat the runoff. The swales will outlet into grated catch basins that connect to the off-site System 3, which ultimately outlets to San Mateo Creek. System 5 includes a storm drain system that intercepts and conveys on-site runoff to a 1 acre-foot EDB located 2,500 ft north of the San Mateo Creek crossing. Where possible, this system is equipped with flow splitters that convey water quality flows to the EDB, which outlets to off-site System 3.

## Off-Site Runoff

### Existing Off-Site Drainage Conditions.

**I-5 and Connectors.** Off-site drainage consists of cross-drainage where runoff generated uphill or upstream of the roadway is passed under the roadway. The regional drainage consists of bridges that convey surface water and stream flow under the roadway. The bridges are designed to pass the 100-year flood (1 percent probability). Along I-5, off-site drainage crosses the freeway under the San Onofre Creek and San Mateo Creek bridge structures.

The existing San Onofre Creek is a relatively narrow natural channel vegetated with low-lying shrubs and grasses. The watershed area for this stream is 43 sq mi and the 100-year flow rate is estimated at 16,700 cubic feet per second (cfs). Flood flow at this location extends over the 240 ft wide main stream channel contained within the high channel banks and bridge abutments of the I-5 crossing. Flood flow depths and velocities range from 13.0–14.4 and 4.0–6.3 fps, respectively. Each existing structure consists of a four-span concrete box girder bridge supported by two

abutments and three piers and are 354 ft long and 68 ft wide, crossing the creek at a skew angle of 10 degrees.

The existing San Mateo Creek is a natural channel vegetated by dense riparian woodlands with a very wide floodplain upstream of I-5 that narrows at the I-5 crossing. The watershed area for this stream is 133 sq mi and the 100-year flow rate is estimated at 40,300 cfs. The crossing at I-5 consists of two parallel five-span reinforced concrete box girder bridges supported on pile-supported reinforced concrete pier walls. The northbound and southbound structures are symmetrical. Flood flow extends over the 320 ft wide main stream channel and is contained within the high channel banks and bridge abutments. Flood flow depths in San Mateo Creek range from 14.8–16.2 ft, and flow velocities range from 12–14 fps. Each existing structure is 500 ft long and 68 ft wide. The four pier walls are 50 ft tall, 2 ft thick, and supported with a pile cap and piles. Each footing is 16 ft wide and approximately 69 ft long, supported by a foundation constructed of 12 3 ft diameter CIDH piles.

**SR-241 and Cristianitos Road.** Storm water runoff north of San Mateo Creek (at the proposed alignment of SR-241 and Cristianitos Road) sheet flows southward into the stream. Erosion over time has produced hillsides streams and gullies that collect and concentrate the flow in some areas. This area is located within the downstream end of the San Mateo Creek watershed.

**Proposed Off-Site Drainage Conditions.**

**I-5 and Connectors.** Proposed improvements at San Onofre Creek consist of widening the existing bridge structure on both the upstream (northbound) side (from 42.5 ft to 52.0 ft) and downstream (southbound) side (from 37.0 ft to 52.7 ft) of I-5. The widened structure would be constructed on pier walls similar to the existing structure, with the same 2 ft width as the existing pier walls. The proposed widening creates an increase in water surface of 0.6 ft at the upstream face of the proposed bridge widening. The increase diminishes to zero approximately 66 ft upstream of the bridge.

Proposed improvements at San Mateo Creek include construction of two connector bridges to SR-241 over San Mateo Creek, upstream of the I-5 bridge structures. The northbound connector is a 3,860 ft long, cast-in-place prestressed concrete box girder bridge supported by 15 single-column piers between the abutments. The bridge crosses San Mateo Creek at a skew angle ranging from 45 degrees at the creek crossing to approximately 70 degrees near the north abutment. The southbound connector is a 3,910 ft long, cast-in-place, prestressed concrete box girder bridge supported by 12 single-column piers and two outriggers between the abutments. The bridge crosses San Mateo Creek at a skew angle ranging from 60 degrees at the creek crossing centerline to approximately 70 degrees near the north abutment. The proposed bridges will result in a maximum increase in water surface elevation of 0.4 ft upstream of the I-5 bridge structure, diminishing to zero approximately 0.75 mi upstream of the proposed bridge structures.

**SR-241 and Cristianitos Road.** The proposed off-site system will consist of culverts and longitudinal ditches that intercept and convey surface water generated uphill of SR-241 under the roadway to existing water courses. The culverts are designed to pass the 10-year flood without

causing the headwater elevation to rise above the inlet top of culvert and to pass the 100-year flood without causing objectionable backwater depths, outlet velocities, or ponded water outside the right-of-way. One 36-inch cross-culvert is proposed where a major flow path is located along the hillside, approximately 5,000 ft north of the San Mateo Creek crossing. South of this location, off-site runoff consists mainly of sheet flow that is intercepted and conveyed through a storm drain system (designated as System 3) to a riprap-lined section of San Mateo Creek located immediately north of I-5 (see Figure 2.6-4).

## 2.6.5 MITIGATION

### Project Design Features

Project design features (PDFs) were incorporated into the proposed project in order to prevent water pollution and improve water quality compared with existing conditions. The PDFs consist of both pollution prevention BMPs and treatment BMPs. Pollution prevention BMPs are used to address design phase elements, construction, and spill mitigation. Treatment BMPs are used in the design to meet regulatory water quality requirements at specific locations. Both pollution prevention and treatment BMPs are included in the Build Alternatives to the Maximum Extent Practicable. Most of the treatment BMPs are designed with a safety factor such that they will function in conditions beyond those prescribed by Caltrans NPDES permit.

The specific PDFs included in the Preferred Alternative to address water quality are:

**PDF 9-1** **Reduction of Downstream Effects Caused By Changes in Flow.** If changes in velocity or volume of runoff, the sediment load or other hydraulic changes due to encroachment, crossings or realignment result in an increased potential for downstream effects in channels, design features to prevent adverse effects are included in the alternatives. These will include one or more of the following (or similar features):

- Modifications to channel lining materials (both natural and man-made), including vegetation, geotextile mats, rock, and riprap.
- Energy dissipation devices at culvert outlets.
- Smoothing the transition between culvert outlets/headwalls/wingwalls and channels to reduce turbulence and scour.
- Incorporating retention or detention facilities into designs to reduce peak discharges, volumes and erosive flow.

**PDF 9-2** **Concentrated Flow Conveyance Systems.** Concentrated flow conveyance systems will be implemented to intercept and divert surface flows, and convey and discharge concentrated flows with a minimum of soil erosion, both on site and off site where applicable. Ditches, berms, dikes, and swales will be used to intercept and direct surface runoff to an overside drain or stabilized watercourse.

**PDF 9-3** **Slope and Surface Protection Systems.** Surface protection will be used to minimize erosion from completed, disturbed surfaces. Surface protection includes but is not limited to vegetative cover or hard surfacing such as concrete, rock, or rock and mortar.

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FIGURE 2.6-4

*Foothill Transportation Corridor – South*

Rock Slope Protection along the
North Embankment of San Mateo Creek

I:\TCA531\Coastal Zone Analysis\Fig 2.6-4.cdr (3/19/07)

**PDF 9-4** **Detention Basins.** EDBs will be incorporated in the alternatives to temporarily detain water and allow sediment and particulates to settle out. The EDBs will be maintained, monitored and documented per Regional Water Quality Control Board (RWQCB) and Caltrans requirements and will conform to the guidelines set forth in the Storm Water Management Plan (SWMP).

**PDF 9-5** **Biofiltration Swales and Strips (Vegetated Treatment Strips).** Biofiltration swales and strips will be used, as shown in the Runoff Management Plan (RMP, Psomas, 2003), where applicable and in association with EDBs, to convey low flow. Bioswales will be maintained, monitored and documented per RWQCB and Caltrans requirements and will conform to guidelines set forth in the SWMP.

**PDF 9-6** **Infiltration Basins.** To the extent feasible or necessary, infiltration basins will be implemented to detain runoff and infiltrate it into the soil to prevent contaminants from impairing the beneficial uses of receiving waters. Infiltration basins will be maintained, monitored and documented per RWQCB and Caltrans requirements and conform to the guidelines set forth in the SWMP.

**PDF 9-7** **Runoff Management PDFs for the Corridor Alternatives.** The Build Alternatives include Best Management Practices (BMPs) to control the flow of roadway runoff and treat, to the maximum extent practicable (MEP), roadway runoff before it leaves the project site and enters existing water courses or storm drain facilities. PDFs for the SOCTIIP Build Alternatives include BMPs such as extended detention basins (EDBs) and grassy swales. The disturbance and right-of-way limits for the build Alternatives, shown on the detailed maps in Appendix A, include areas for EDBs and other BMPs.

**PDF 9-8** Prior to completion of final design of the selected alternative, TCA shall obtain approval of the hydrologic methodology and parameters to be analyzed in the Final Hydrologic Technical Report and incorporated into the Final Location Hydraulic Study from affected jurisdictional agencies.

**PDF 9-9** Final design will include refinements to ensure that the bridges will be constructed to span the 100-year floodplain without raising the 100-year base floodplain water surface elevation more than 0.3 meter (1.0 ft), or otherwise causing adverse changes in the extent of the floodplain or the potential for erosion.

These runoff management PDFs and other measures to reduce adverse impacts of the alternatives related to water quality are described in greater detail in Section 4.9 (Affected Environment, Impacts and Mitigation Measures Related to Water Quality) of the Final SEIR and in the RMP.

## Mitigation Measures

Mitigation measures were provided in the Mitigation Monitoring Plan (MMP) for Environmental Impact Report (EIR) No. 3 for the Foothill Transportation Corridor – Oso Parkway to I-5, to minimize the impacts to water quality identified for the alignments analyzed in that EIR. All the mitigation measures in the MMP for EIR No. 3 were reviewed and have been incorporated, as applicable, in the mitigation measures for the Preferred Alternative.

The following are the Mitigation Measures for Water Quality as included in the Final SEIR:

**WQ-1** **Preservation of Adjacent Existing Vegetation.** The TCA or other implementing agency/agencies, as appropriate will preserve to the extent feasible existing vegetation at areas on the construction site where either no construction activity is planned or where it will occur at a later date. The vegetation will be preserved according to the California Storm Water BMPs Municipal Handbook (1993) as listed in the RMP.

**WQ-2** **Construction Site BMPs.** The TCA or other implementing agency/agencies as appropriate will implement construction site BMPs as appropriate, during construction of the SOCTIIP alternatives. These BMPs are described in the California Best Management Practice Handbooks for Construction (1993, revision pending), Caltrans, SWMP and Storm Water Quality Handbooks. BMPs categories include measures for temporary sediment control, temporary soil stabilization, scheduling, preservation of existing vegetation, conveyance controls, wind control, temporary stream crossings and waste management as well as many other measures which may be implemented during construction of a highway project. These measures are consistent with requirements set forth under the California State Water Resources Control Board (SWRCB) Order No. 99-08-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002 (General Construction Permit), which governs storm water and non-storm water discharges during construction activities, as well as with those requirements set forth in the Caltrans Permit Order No. 99 - 06 - DWQ (CAS 000003). These BMPs are directed at reducing storm runoff pollutants and eliminating non-storm water discharges.

**WQ-3** **Storm Water Pollution Prevention Plan (SWPPP).** Prior to start of soil-disturbing activity at the project site, a Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) will be prepared in accordance with and to partially fulfill the General Construction Permit. The SWPPP will be prepared per the SWPPP and Water Pollution Control Program (WPCP) Preparation Manual, (Storm Water Quality Handbooks, November 2000.) The SWPPP will meet the applicable provisions of Sections 301 and 402 of the CWA by requiring controls of pollutant discharges that utilize best available technology (BAT) which is economically achievable and best conventional pollutant control technology (BCT) to reduce pollutants. The SWPPP will be implemented concurrently with commencement of the soil-disturbing activity. The SWPPP will need to be certified in accordance with the signatory requirements of the General Construction Permit.

**WQ-4** **Spill Contingency.** Emergency planning for highway spills will be addressed by both operational and structural BMPs. The TCA, Caltrans or other implementing agency/agencies as appropriate, will take primary responsibility for spill clean-up and contingencies during construction and operation of the project, though coordination with other agencies will be necessary.

Operational BMPs include immediate emergency notification through 911 during a spill event. After emergency notification, the following notifications will occur:

- The local fire department and the Orange County Fire Authority will then be notified, and emergency actions (road closures, medical evacuation, cleanup of hazardous materials, etc.) will be taken; if the spill occurs on or affects MCB Camp Pendleton, these authorities will be notified.
- If the spill is above the Reportable Quantity (RQ), the State Office of Emergency Services (800.852.7550) will be contacted and a control number provided. The National Response Center (800.424.8802) will be contacted to comply with Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requirements. The California Hazardous Material Incident Reporting System (CHMIRS) (916.427.4287) will be notified (assuming the spill volume is more than four liters (two gallons)) and appropriate forms filled out.

Structural BMPs consist of mechanisms within water quality BMPs to prevent large spills from reaching watercourses. These BMPs could consist primarily of operation valves at outlet works (e.g., from basins) that could be closed in an emergency. In this event, cleanup of hazardous materials and pollutants will be required within the basins to remove contaminated materials.

**WQ-5** **Operations, Maintenance and Monitoring Plan.** When an alternative is selected for implementation an Operations, Maintenance and Monitoring Plan will be developed in consultation with the appropriate agencies, i.e., Caltrans. Maintenance objectives for project BMPs will be addressed and formalized in the Operation, Maintenance and Monitoring Plan. Caltrans will monitor the BMPs to ensure maintenance objectives are being met. Details of the monitoring will comply with Caltrans Storm Water Policy and requirements of the 401 Certification with Caltrans as the holder of the statewide permit for state highways.

**WQ-6** **Monitoring of BMPs.** For the corridor Alternatives, the TCA will monitor Caltrans' maintenance of the BMPs for five years to assure compliance with maintenance criteria and schedules. The TCA will provide annual reports to the Regional Water Quality Control Boards documenting the maintenance of the BMPs.

Multi-objective mitigation measures were identified and developed to address potential construction and operation impacts of the Preferred Alternative related to water quality. For water quality, the mitigation measures are comprised of both pollution prevention BMPs and treatment BMPs. Pollution prevention BMPs are used to address design phase elements, construction and spill mitigation. Treatment BMPs are used to mitigate identified impacts on a site-specific basis.

### Water Pollution Control Strategy

**Construction.** The project owner is required to obtain coverage under the Construction General Permit for discharge of storm water from a construction activity prior to the start of construction of the project. A SWPPP will be prepared once final design documents are available. The selection of construction BMPs will be determined as a part of the development of the SWPPP; however, the project Final SEIR and supporting documents describe the following general construction BMPs for the project:

- Source identification and control (through covering and containing) of potential pollutants

- Erosion control techniques for temporary, permanent and wind conditions. Types of erosion control to be considered include rolled erosion control products (RECPs) and hydraulically applied mulches.
- Sediment control techniques with the specific objective of maintaining sediment loads consistent with preconstruction levels. Types of sediment control BMPs to be considered include fiber rolls, silt fence, drainage inlet protection and sediment traps and basins.
- Control of non-storm water through the elimination of sources.

In addition, the RMP stipulated that the SWPPP will include a storm water runoff sampling plan to ensure that BMPs are functioning effectively during construction.

**Post-Construction.** The post-construction storm water program for the SOCTIIP alternatives was developed based on the Caltrans Statewide Storm Water Quality Practice Guidelines (CTSW-RT-02-009).

**Pollution Prevention.** The overall surface water quality program was designed to incorporate pollution prevention and source control BMPs in association with treatment control BMPs. A variety of pollution prevention BMPs were included in the planning phases of the project development. The following pollution prevention BMPs were described in the Final SEIR and supporting technical documents:

- Minimize impervious surfaces
- Stabilize disturbed soil areas
- Maximize vegetated surfaces
- Preserve existing vegetation
- Construct concentrated flow conveyance systems
- Outlet protection (energy dissipation)

Pollution prevention BMPs were considered in the final selection of the corridor alignment, the selection of the corridor roadway cross section, and in the development of the concept grading plan. Further, the project will include demarcation of the limit of disturbed soil area during construction to ensure that adjacent vegetation is preserved.

**Pollutant Removal.** The selection of treatment BMPs was based on the Caltrans Storm Water Management Plan (SWMP, August 2001). The Caltrans SWMP included specific analysis regarding BMPs for targeted design constituents for highway runoff as well as specialized recommendations for maintenance of approved BMPs. The Caltrans-approved treatment BMPs considered for implementation on the project were:

- Vegetated swales
- Vegetated strips

- EDBs
- Infiltration basins
- Dry weather flow diversions
- Gross solids removal devices (GSRDs)

The Final SEIR and technical support documents reviewed the feasibility of each of the BMPs listed above for the conditions associated with the corridor alignments. The following is a brief summary of the treatment BMP feasibility analysis.

- **Vegetated Swales.** Vegetated swales were considered at locations along the alignments where longitudinal slopes were consistent with design criteria and where right-of-way requirements would not conflict with other environmental mitigation. Much of the corridor alignment is at longitudinal grades exceeding about 3 percent due to the local topography. As a result, vegetated swales were not considered technically feasible in many locations. Further, swales require additional right-of-way as compared to an underground drainage system. In areas with sensitive vegetation or habitat (such as coastal sage scrub), swales were not considered feasible if their use also required additional mitigation of vegetation or habitat due to additional right-of-way requirements.
- **Vegetated Strips.** Vegetated strips are generally used in association with vegetated swales to convey roadway runoff from the edge of pavement. The same constraints associated with vegetated swales (roadway slopes and additional encroachment into sensitive areas) also restricted the use of this BMP along the corridor alignments studied.
- **EDBs.** EDBs were selected by the feasibility analysis in the project Final SEIR and supporting technical documents as the best BMP for implementation as a part of the SOCTIIP. EDBs were determined to be effective in mitigating the targeted design constituents and the siting and design constraints for this device could be accommodated.
- **Infiltration Basins.** Infiltration basins are a good choice for surface water protection where there are soils that support their use. Most of the corridor alignments studied were located in upland areas away from streams and stream courses. The soil material underlying most of the alignments is primarily siltstone, with associated low permeability that does not support the use of infiltration basins.
- **Dry Weather Flow Diversions.** The corridor alignments are located in largely undeveloped areas where urban runoff (dry weather flow) is not present. Further, the roadway construction was not anticipated to intersect the groundwater table or require permanent dewatering. Consequently, dry weather diversions were not judged to be a suitable BMP for this project.
- **GSRDs.** GSRDs remove gross solids (defined as a particle about 5 millimeters [mm] square or larger) and are specifically targeted for trash and debris. Trash and debris was determined to be a targeted design constituent for the SOCTIIP, and there were no design criteria limitations for the use of GSRDs on the project. GSRDs were not ultimately selected for use on the SOCTIIP because the selected BMP would also effectively remove gross solids.

The EDBs were preliminarily located and sized based on the water quality volume (WQV) resulting from 0.8 inch of rainfall. The resulting volume was subsequently multiplied by a factor of two resulting in a larger required basin footprint to provide for mitigation for hydrologic,

erosion, and sedimentation impacts in local drainages. Final size determination of the EDBs as well as the determination of optimum basin locations were deferred to the final design stage and the final project RMP.

### Pollution Source Control

**Reduction of Impacts from Flow Changes.** In general, the project would result in a minor increase in impervious surface in the watersheds for these creeks, which can be expected to translate into minor localized increases in runoff. However, lag time between the peak runoff of these major streams and that from the freeway runoff is large (i.e., the peak flow from the freeway will have substantially subsided by the time the watershed peak occurs). This, coupled with the minor increase in impervious surface (approximately 0.2 percent of the San Mateo Creek watershed and less than 0.1 percent of the San Onofre Creek watershed), results in an insignificant increase in peak flows found in San Onofre and San Mateo Creeks. In order to mimic preproject flows, inlet flow splitters have been incorporated into the design of the long storm drain systems. The flow splitters capture and convey water quality flows to EDBs and allow peak flows to continue on their original flow path.

**Preservation of Existing Vegetation.** Existing desirable vegetation and landscaping will be protected in place, where possible, and will be shown on plan. The project will include demarcation of the limit of disturbed soil area during construction to ensure that adjacent vegetation is preserved.

**Concentrated Flow Conveyance Systems.** Risks due to erosion or washout will be minimized through the use of rock slope protection, hydroseeding, ground cover, mulch, longitudinal ditches, and down drains. Velocity dissipation devices, flared end outlets, headwalls, transition structures, and splash walls will be incorporated into the design where necessary at culvert inlets and outlets to prevent erosion. Lined longitudinal ditches will be incorporated at the uphill side of SR-241 to intercept sheet flow where necessary and to convey it to culverts or bridges that cross under the roadway. Culvert outlets will be equipped with appropriate energy dissipating devices.

**Slope and Surface Protection Systems.** Various slope and surface protection measures will be used to address site soil stabilization and reduce deposition of sediments in the adjacent surface waters. Typical measures include the application of soil stabilizers such as hydroseeding, rock slope protection, velocity dissipation devices, flared end sections for culverts, and others. The project will be constructed to minimize erosion by: incorporating retaining walls to reduce the steepness of slopes or to shorten slopes; providing cut and fill slopes flat enough to allow revegetation and limit erosion to preconstruction rates; and collecting concentrated flows in stabilized drains and channels. Energy dissipaters in the form of riprap, impact basins, or velocity control rings will be provided at storm drain outlets to control erosion. Riprap sizes and thicknesses will be shown on the plans and stone gradation/placement methods will be defined in the specifications.

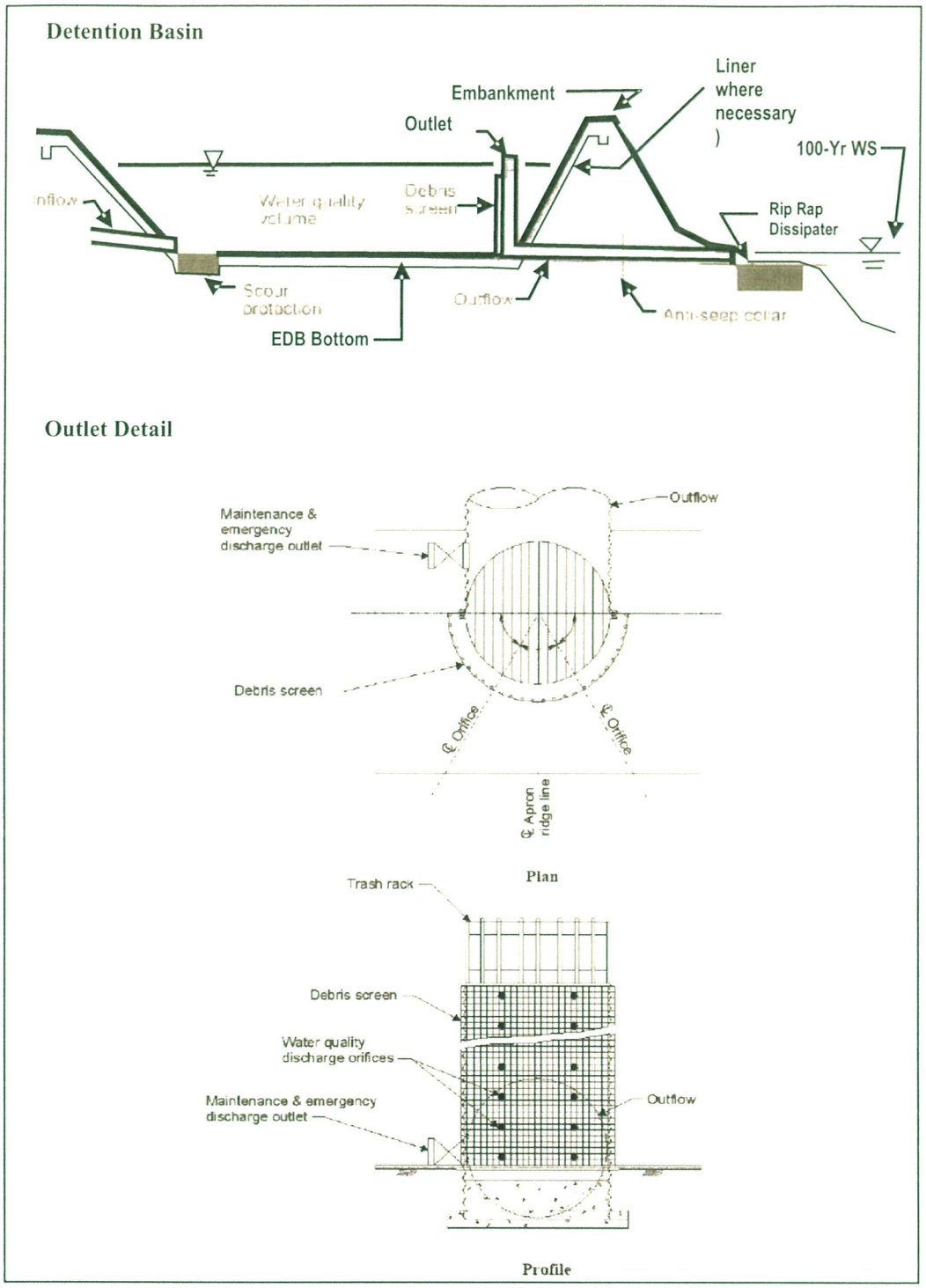
## Pollution Treatment Control

**Requirements.** BMPs will be designed and implemented to reduce the discharge of pollutants from the on-site storm drain system for 100 percent of the SR-241 freeway runoff and 2 mi of I-5 tributary to San Onofre and San Mateo Creeks where no BMPs are in place. Treatment BMPs considered feasible and practicable for the project include EDBs and biofiltration swales as described in Section 5. Incorporation of these BMPs into the on-site drainage system will result in an improvement in water quality from I-5 runoff before it enters into the receiving water bodies. Constraints evaluated during BMP design included: (1) land use (e.g., impacts on culturally and biologically sensitive sites were minimized); (2) storm drain conveyance viability (e.g., collection, conveyance, and treatment of bridge runoff required detailed analysis); (3) narrow corridor constraints (e.g., locating EDBs along hillsides with maintenance access required detailed grading); and (4) outlet locations (e.g., outleting directly to major streams minimizes potential erosion on hillsides). On-site drainage from I-5 from San Mateo Creek southward 2 mi will be retrofitted to treat on-site runoff. All of the proposed SR-241 on-site runoff will also be treated.

**EDB Design.** EDBs are impoundments where the water quality volume resulting from 0.8 inch of rainfall is temporarily detained under calm conditions, allowing sediment and particulates to settle out. Detention basins collect litter, settleable solids (debris), total suspended solids (TSS), and pollutants that are attached (absorbed) to the settled particulate matter. Vegetated low-flow channels within the basins serve as oil and grease traps, providing additional pollutant removal. All EDBs will be designed per Caltrans standards and will be accessible for maintenance with 12 ft wide access roads designed with adequate turnaround for maintenance vehicles. The maximum access road grade will not exceed 18 percent and grades greater than 9 percent shall be paved. Liners will be required where groundwater levels are less than 10-ft from the bottom of the basin. Historic groundwater levels of monitoring wells located adjacent to the proposed San Onofre and San Mateo EDB sites indicate that groundwater may rise to within 8 ft and 5 ft from the basin inverts for the two basins, respectively (Stetson, 2005). Figure 2.6-5 shows typical design details for the EDBs.

Two EDBs are proposed for the area within the Coastal Zone limits. These include one adjacent to San Onofre Creek and one adjacent to San Mateo Creek. The runoff area tributary to the San Onofre Creek EDB is 62 acres, which includes those sections of I-5 and SR-241 from Basilone Road to the south (see Exhibits BMP-01 and BMP-02 in Appendix A). The runoff area tributary to the San Mateo Creek EDB is 41 acres, which includes those sections of I-5 and SR-241 from the San Mateo Creek crossings southward to Basilone Road. The water quality volumes are 3.7 acre-feet and 2.5 acre-feet for the San Onofre Creek EDB and San Mateo Creek EDB, respectively.

**Swale Design.** Biofiltration swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of stormwater runoff.




LSA

FIGURE 2.6-5

*Foothill Transportation Corridor - South*

Proposed EBD Design Details

I:\TCA531\Coastal Zone Analysis\Fig 2.6-5.cdr (3/19/07)

Swales were considered at locations along the alignment where longitudinal slopes do not exceed 2 percent and where right-of-way requirements would not conflict with other environmental mitigation. Much of the corridor alignment is at longitudinal grades exceeding about 3 percent due to the local topography. As a result, vegetated swales were not considered technically feasible in many locations. Within the limits of the Coastal Zone, three swales are proposed. These will be located immediately north of the SR-241 crossing of San Mateo Creek. Here, the vegetated trapezoidal swales shall be located in the median of SR-241 at a slope of less than 2 percent, with 4:1 side slopes and lengths ranging from 200–500 ft. Swales will be designed to Caltrans standards which require water quality flow velocities (equal to the flow generated from the 85th percentile storm) to be low enough to keep hydraulic residence times in the swale greater than 5 minutes. The swales will be vegetated with native grasses and will treat runoff from SR-241 for the area north of San Mateo Creek from the connector structures to the Cristianitos Road crossing. The downstream ends of the swales shall connect to grated inlet structures which outlet to an adjacent off-site storm drain system (that ultimately conveys the treated flow to the north bank of San Mateo Creek).

## 2.6.6 CONCLUSION

Best Management Practices (BMPs) will be designed and implemented to reduce the discharge of pollutants from the on-site storm drain system for all of the SR-241 freeway runoff and 2 miles of I-5 tributary to San Onofre and San Mateo Creeks where no BMPs are in place. Treatment BMPs for the project include extended detention basins (EDBs) and biofiltration swales. Incorporation of these BMPs into the on-site drainage system will result in an improvement in water quality from I-5 runoff before it enters into the receiving water bodies that drain directly to the Pacific Ocean. See the Runoff Management Summary in Appendix B of this document for more information about the implementation of water quality BMPs in the Coastal Zone.

# 2.7 WATERS AND WETLANDS OF THE UNITED STATES

## 2.7.1 INTRODUCTION

The potential impact of the proposed project on waters of the United States (WoUS) and wetlands are evaluated in detail in the Natural Environment Study (P&D Consultants, 2003) and are summarized in Section 4.10 of the Final SEIR.

Pursuant to the California Coastal Act of 1976 (California Public Resources Code Section 30000 et seq.), the California Coastal Commission (CCC) regulates land uses within or adjacent to environmentally sensitive habitat areas (ESHAs) within the "Coastal Zone." The Coastal Act Section 30103 defines the Coastal Zone as:

> *that land and water area of the State of California from the Oregon border to the border of the Republic of Mexico...extending seaward to the state's outer limit of jurisdiction, including all offshore islands, and extending inland generally 1,000 yards from the mean high tide line of the sea. In significant coastal estuarine, habitat, and recreational areas it extends inland to the first major ridgeline paralleling the sea or five miles from the mean high tide line of the sea, whichever is less, and in developed urban areas the zone generally extends inland less than 1,000 yards.*

The Coastal Act Section 30107.5 defines an ESHA as:

> *. . . any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.*

Included within this definition are wetlands, estuaries, streams, riparian habitats, lakes, and portions of open coastal waters that meet the rare or valuable habitat criteria. The CCC regulates the diking, filling, or dredging of wetlands, or lands within 100 feet (ft) of wetlands, within the Coastal Zone. The Coastal Act Section 30121 defines "coastal wetlands" as lands "within the coastal zone which may be covered periodically or permanently with shallow water." The 1981 CCC Statewide Interpretive Guidelines state that hydric soils and hydrophytic vegetation:

> *. . . are useful indicators of wetland conditions, but the presence or absence of hydric soils and/or hydrophytes alone are not necessarily determinative when the Commission identifies wetlands under the Coastal Act. In the past, the Commission has considered all relevant information in making such determinations and relied upon the advice and judgment of experts before reaching its own independent conclusion as to whether a particular area will be considered wetland under the Coastal Act. The Commission intends to continue to follow this policy.*

While wetlands are defined by the concurrent presence of three indicators (wetland hydrology, hydrophytic vegetation, and hydric soils) for the purpose of federal regulatory programs administered

by the United States Army Corps of Engineers (Corps), the CCC, according to the guidelines quoted above, only requires the presence of one of these indicators in the positive determination of coastal wetlands. As such, the CCC also includes riparian habitats that exhibit a predominance of hydrophytic vegetation within their definition of coastal wetlands. Riparian vegetation is defined in the 1981 CCC Statewide Interpretive Guidelines as "an association of plant species which grows adjacent to freshwater watercourses, including perennial and intermittent streams, lakes, and other bodies of fresh water." Riparian habitats may encompass wetland areas, but may also extend beyond those areas.

## 2.7.2 SETTING

### Study Area Setting

The Preferred Alternative is an extension of the existing Foothill Transportation Corridor (FTC) State Route (SR) 241 from Oso Parkway to Interstate 5 (I-5) near the Orange County/San Diego County boundary. The proposed project is generally located in the coastal foothills of southern Orange and extreme northwestern San Diego Counties and is approximately 16 miles (mi) long, with approximately 0.8 mi of improvements on the I-5. Topographically, this region exhibits low-lying ridgelines and mountains interspersed with relatively broad valleys and canyon bottoms. Elevations range from sea level at the coastline to approximately 900 ft above sea level in the interior hills. The region is entirely underlain with marine and nonmarine sedimentary rocks with overlaying marine terrace, fan, alluvium, and landslide deposits. The proposed project occurs primarily within a largely undeveloped area, with scattered areas of active agriculture, sand and gravel mining, a State park on leased land, and Marine Corps military operations. Much of the remaining undeveloped area has supported and/or is being used for livestock grazing. Considerable areas of natural open space also exist. These areas support several major vegetation types, including grasslands, scrub, chaparral, oak and riparian woodlands, marshes, and other wetlands. These in turn provide habitat for a wide variety of animals, including many invertebrate, amphibian, reptile, bird, and mammal species.

There are two major drainage basins, the San Juan Creek Watershed and San Mateo Creek Watershed, within the vicinity of the Proposed Project. The San Juan Creek Watershed covers approximately 134 square miles (sq mi) and includes portions of the Cities of Dana Point, Laguna Hills, Laguna Niguel, Mission Viejo, Rancho Santa Margarita, and San Juan Capistrano. Its main tributary, San Juan Creek, originates in the Santa Ana Mountains district of the Cleveland National Forest in the easternmost part of Orange County. Other smaller, but still substantial, drainage courses include Bell Canyon, Cañada Gobernadora, and Cañada Chiquita, which are tributaries to San Juan Creek. The San Mateo Creek Watershed covers approximately 139 square miles (sq mi). Its drainage area lies within western Riverside and northwestern San Diego Counties, with approximately 20 percent in the boundary of southeastern Orange County. Gabino Canyon, Blind Canyon, and Cristianitos Creek are tributaries to San Mateo Creek.

### Coastal Zone Setting

Potential CCC jurisdiction at the site may include all areas that are permanently or periodically inundated or saturated close to the soil surface occurring within the Coastal Zone. In light of the definitions of "Coastal Zone," "ESHA," and "wetland," portions of San Mateo Creek, San Mateo Marsh, San Onofre Creek, FE/7-Vernal Marsh 20, FE/7-Vernal Pool 3, and FE/7-Vernal Pool 4 are

located within the Coastal Zone. These jurisdictional areas include, but are not limited to, all riparian habitats within the California Department of Fish and Game (CDFG) jurisdiction and all federally defined wetlands within Corps jurisdiction. See Figure 2.7-1.

## 2.7.3 IMPACTS

### Project Impacts

The Preferred Alternative will permanently impact approximately 6.27 acres (ac) of Corps jurisdiction, of which 0.82 ac consists of jurisdictional wetland. Temporary impacts to Corps jurisdiction total 9.44 ac, of which 6.73 ac consist of jurisdictional wetland. Permanent impacts to CDFG jurisdiction total 23.08 ac, of which 20.37 ac consist of vegetated riparian habitat. Temporary impacts to CDFG jurisdiction total approximately 14.61 ac, of which 14.58 ac consist of vegetated riparian habitat. Permanent impacts to Regional Water Quality Control Board (RWQCB) jurisdiction (isolated waters of the State) total 7.95 ac. Temporary impacts to RWQCB jurisdiction (isolated waters of the State) total 9.49 ac. Because impacts to Corps, CDFG, and RWQCB wetlands listed above occur to the same set of drainage features, the impacts are not additive.

### Impacts in Coastal Zone

The Preferred Alternative will permanently impact approximately 0.46 ac and temporarily impact approximately 6.44 ac, all of which consist of wetlands subject to CCC jurisdiction. These impact totals represent only the surface area subject to regulation by the CCC and do not represent a relative assessment of function. This analysis assumes that all features within the disturbance limits are permanently filled, except for those that will be bridged. For bridges, the small area of impact where the support columns are founded into the ground have been included as permanent impacts, while the remaining bridge right-of-way is assumed to be temporarily impacted for piling installation, although the bridge structure will span over the open terrain.

The following wetland features are located within the Coastal Zone.

**FE/7-San Mateo Creek.** The San Mateo Creek/Wetland Complex consists of the braided channel of San Mateo Creek and includes areas of the low-flow channel, which are supported by base flow throughout the year. The channel varies from 200 to 1,100 ft wide and is composed of coarse sand with cobbles and boulders. There are similar but narrower braids throughout the channel bed with several islands that support both annual and perennial vegetation, including mulefat (*Baccharis salicifolia*, FACW-), narrow-leaved willow (*Salix exigua*, OBL), arroyo willow (*Salix lasiolepis*, FACW), fennel (*Foeniculum vulgare*, FACU), rabbitsfoot grass (*Polypogon monspeliensis*, FACW+), red and ripgut brome (*Bromus rubens* and *Bromus diandrus*, UPL), white clover (*Melilotis alba*, FACU), and curly dock (*Rumex crispus*, FACW-). In general, vegetation within the drainage varies from mature willow woodland to mulefat scrub and open cobbly wash. Wetland areas are vegetated with yellow willow (*Salix lucida*, FACW), arroyo willow (*Salix lasiolepis*, FACW), cattail (*Typha domingensis*, OBL), spike rush (*Eleocharis acicularis*, OBL), bulrush (*Scirpus americanus*, OBL), narrow leafed willow (*Salix exigua*, OBL), mulefat (*Baccharis salicifolia*, FACW-), sedge (*Cyperus* sp., ≥FACW) iceplant (*Carpobrutus* sp., UPL), saltgrass (*Distichlis spicata*, FACW), celery (*Apium graveolens*, FACW), cudweed (*Gnathalium luteo-album* (FACW-), white alder (*Alnus rhombifolia*,

LSA

County Boundary

Coastal Zone Boundary

Preferred Alternative (11/26/06)

Wetlands

Permanent Impacts to Wetlands

Temporary Impacts to Wetlands

SOURCE: EagleAerial (4/06); TCA (11/29/06); CCC (2005); GLA (11/04)

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FIGURE 2.7-1

*Foothill Transportation Corridor – South*

Coastal Wetlands

FACW), horsetail (*Equisetum* sp., ≥FAC), and rabbitfoot grass (*Polypogon monspeliensis*, FACW+). Riparian habitat within the Coastal Zone totals 17.44 ac, all of which consists of one-parameter wetland.

**FE/7-San Mateo Marsh East of I-5.** Inland from I-5, a portion of San Mateo Marsh, separated from San Mateo Creek by agricultural fields, is located immediately east of I-5 and north of Basilone Road. This area consists of willow riparian forest and brackish marsh. The willow riparian forest is dominated by arroyo willow (*Salix lasiolepis*, FACW) with an understory of giant nettle (*Urtica dioica*, FACW). The wettest areas within the willow forest support fruit bur-reed (*Sparganium eurycarpum*, OBL), Olney's bulrush (*Scirpus americanus*, OBL), red-rooted umbrella sedge (*Cyperus erythrorhizos*, OBL), straw-colored umbrella sedge (*Cyperus strigosus*, FACW), and California bulrush (*Scirpus californicus*, OBL). Sediment deposits and moderate shelving indicated the presence of hydrology. Soils were composed of low chroma silt layers interbedded with layers of fine sand and buried organics. Riparian habitat within the Coastal Zone totals 23.52 ac, all of which consists of one-parameter wetland.

**FE/7-San Mateo Marsh West of I-5.** San Mateo Marsh is a coastal freshwater marsh that is located near the southern end of the study area where San Mateo Creek discharges into the ocean. The marsh is a mosaic of wetland/riparian habitat that is located on both the coastal and inland sides of I-5. The Trestles Wetland Preserve, on the coastal side of I-5, consists of willow riparian forest, southern sycamore riparian forest, freshwater marsh dominated by hardstem bulrush (*Scirpus acutus*, OBL) and southern cattail (*Typha domingensis*, OBL), brackish marsh dominated by Olney's bulrush (*Scirpus americanus*, OBL), and small areas of coastal salt marsh dominated by fleshy jaumea (*Jaumea carnosa*, OBL) and pickleweed (*Salicornia virginica*, OBL).

**Vernal Marsh FE/7-VM 20.** Vernal Marsh FE/7-VM 20 is located adjacent to the I-5 off-ramp at Basilone Road. The basin appears to have been created by construction of the off-ramp and supports hydrophytic vegetation, including mulefat (*Baccharis salicifolia*, FACW), arroyo willow (*Salix lasiolepis*, FACW), western goldenrod (*Euthamia occidentalis*, OBL), and salt marsh fleabane (*Pluchea odorata*, OBL). The basin was observed to be ponded from February 13–21, 2001, meeting criteria 3 for hydric soils.

**Vernal Pool FE/7-VP 3.** Vernal Pool FE/7-VP 3 is a basin that covers 0.18 ac vegetated with dwarf wholly heads (*Psilocarphus brevissimus*, OBL), rabbitfoot grass (*Polypogon monspeliensis*, FACW), Boccone's sand spurry (*Spergullaria bocconei*, FAC), smooth cat's ear (*Hypochaeris glabra*, UPL), and mulefat (*Baccharis salicifolia*, FACW). The basin was observed to be ponded from February 13–21, 2001, meeting criteria 3 for hydric soils.

**San Onofre Creek.** The San Onofre Creek/Wetland complex is a major drainage within the study area. The low flow channels within the creek are dominated by herbaceous cover, including water-cress (*Rorippa nasturtium-aquaticum*, OBL) yellow waterweed (*Ludwigia peploides*, OBL), water speedwell (*Veronica anagallis-aquatica*, OBL), southern cattail (*Typha domingensis*, OBL), and

common monkey flower (*Mimulus guttatus*, OBL). Dominant overstory vegetation includes western sycamore (*Platanus racemosa*, FACW) and arroyo willow (*Salix lasiolepis*, FACW).

**Vernal Pool FE/7-VP 4.** Vernal Pool FE/7-VP 4 is located on the bluff north of San Onofre Creek. The 0.09 ac basin supported dwarf wholly heads (*Psilocarphus brevissimus*, OBL), hyssop loosestrife (*Lythrum hyssopifolium*, FACW), rabbitfoot grass (*Polypogon monspeliensis*, FACW), and curly dock (*Rumex crispus*, FACW). The basin was observed to be ponded from February 13–21, 2001, meeting criteria 3 for hydric soils.

Permanent impacts to CCC jurisdiction total 0.46 acre, all of which consist of wetland. Temporary impacts to CCC jurisdiction total 6.44 acres, all of which consist of wetland.

**Permanent Impacts to CCC Wetlands**

| Feature | Type | Acres |
|---|---|---|
| FE/7-San Mateo Creek | Perennial | 0.01 |
| FE/7-San Mateo Marsh-East of I5 | Freshwater Forested Wetland | 0.21 |
| FE/7-VM20 | Depressional Wetland | 0.05 |
| FE/7-VP3 | Depressional Wetland | 0.18 |
| San Onofre Creek | Perennial | 0.01 |
| **TOTAL** | **NA** | **0.46** |

**Temporary Impacts to CCC Wetlands**

| Feature | Type | Acres |
|---|---|---|
| FE/7-San Mateo Creek | Perennial | 5.3 |
| San Onofre Creek | Perennial | 1.14 |
| **TOTAL** | **NA** | **6.64** |

## 2.7.4 MITIGATION

Mitigation measures were provided in the Mitigation Monitoring Program (MMP) for Final Transportation Corridor Agencies (TCA) Environmental Impact Report (EIR) No. 3 for the Foothill Transportation Corridor – Oso Parkway to I-5, to minimize the impacts to WoUS and wetlands uses identified for the alignments analyzed in the TCA EIR No. 3. All the mitigation measures in the MMP for TCA EIR No. 3 were reviewed and have been incorporated, as applicable, in the mitigation measures for the SOCTIIP Alternatives.

The mitigation measures below were included in the Certified Final SEIR for the Preferred Alternative, and are listed in the Mitigation Monitoring and Reporting Program in Appendix A of this document.

**WW-1** Prior to construction, the TCA or other implementing agency/agencies shall designate a Project Biologist responsible for overseeing biological monitoring, regulatory compliance,

and restoration activities associated with construction of the selected alternative in accordance with the adopted mitigation measures and applicable law.

**WW-2** During final design of the project, the Project Biologist shall review the design plans and make recommendations for avoidance and minimization of sensitive biological resources. The TCA or other implementing agency/agencies Environmental and Engineering Staff shall determine the implementation of those recommendations.

**WW-3** A Biological Resources Management Plan (BRMP) shall be prepared prior to construction. The BRMP shall provide specific design and implementation features of the biological resources mitigation measures outlined in the resource agency approval documents. Issues during construction and operation to be addressed in the BRMP shall include, but are not limited to, resource avoidance, minimization, and restoration guidelines, performance standards, maintenance criteria, and monitoring requirements. The Draft BRMP shall be submitted to the USFWS, National Marine Fisheries Service (NMFS), CDFG, Corps, RWQCB, Federal Highway Administration (FHWA), the CCC, and the California Department of Transportation (Caltrans) for review to the extent required by permit by such agencies.

The primary goal of the BRMP will be to ensure the long-term perpetuation of the existing diversity of habitats through restoration in the project area and adjacent urban interface zones and to prevent off-site or indirect effects. The BRMP shall contain at a minimum the following:

a. Identification of all Environmental Sensitive Areas (ESA). ESAs are defined as sensitive habitats including, but not limited to, areas subject to the jurisdiction of the CDFG, Corps, and USFWS.

b. Design of protective fencing (i.e., t-bar or yellow rope) around ESAs and the construction staging areas.

c. Locations of trees to be protected as wildlife habitat (roosting sites).

d. For areas that will be restored, the quality of the adjacent habitat will be characterized. This characterization shall include species composition, density, coverage, and presence of nonnatives. This characterization will provide a baseline to compare the success of the restoration. The site preparation plan for each restoration site will include:

   - Sources of plant materials and methods of propagation.
   - Site preparation (clearing, grading, weed eradication, soil amendment, topsoil storage), irrigation, planting (container plantings, seeding), and maintenance (weed control, irrigation system checks, replanting) of restoration areas. Specification of parameters for maintenance and monitoring of restoration areas, including weed control measures, frequency of field checks, and monitoring reports for temporary disturbance areas within the right-of-way.
   - Remedial measures to be taken if performance standards are not met.
   - Methods and requirements for monitoring of the restoration efforts.

- Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within restoration areas.

e. Specific measures for the protection of sensitive habitats to be preserved in and adjacent to the right-of-way to ensure that construction does not increase beyond the impacts identified in the EIS/SEIR. These measures will include, but are not limited to, erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements. Details of the erosion, siltation, and dust control mitigation measures will be provided in the Storm Water Pollution Prevention Plan (SWPPP).

**WW-4** In conjunction with the development of final plans and specifications for construction, or other activities involving vegetation/habitat removal, the Project Biologist shall review and approve the contractor's map of all sensitive habitats (Environmentally Sensitive Areas) within 152.4 meters (500 feet) of the grading limits on the grading plans. The ESA maps shall be prepared by the construction contractor's qualified biologist and approved by the TCA or other implementing agency/agencies. All ESAs to be avoided and performance standards established by the resource agencies shall be clearly noted on the grading, construction, and landscape plans. Additionally, the landscape plans shall indicate that plant materials be local southern Orange County natives.

**WW-5** During grading activities and construction operations, the Project Biologist shall conduct monitoring within and adjacent to sensitive habitats including monitoring of the installation of protective devices (silt fencing, sandbags, fencing, etc.), installation and/or removal of creek crossing fill, construction of access roads, vegetation removal, column installation, falsework installation and removal, and other associated construction activities, as deemed appropriate by the Project Biologist. Biological monitoring shall be conducted to document adherence to habitat avoidance and minimization measures addressed in the project mitigation measures and as listed in the USFWS, CDFG, and Corps permits/agreements.

**WW-6** Final design and construction shall restore the perennial river and stream channels and ephemeral drainages and washes to their original contours upon completion of construction where feasible, with the exclusion of areas of permanent impact.

**WW-7** During all construction activities, the Contractor shall ensure that construction equipment or vehicles shall not be stored in areas defined as ESAs, including areas within the jurisdiction of the Corps and/or CDFG. There shall be no fueling, lubrication, storage, or maintenance of construction equipment within 46 meters (150 feet) of CDFG or Corps jurisdictional areas. Construction equipment staging/storage shall be located in previously disturbed or non-native areas to the maximum extent possible.

**WW-8** During all construction activities, the Contractor shall ensure that no waste material shall be discharged to any CDFG or Corps jurisdictional areas. Spoil sites shall not be located within any CDFG or Corps jurisdictional areas, or in areas where it could be washed into any surface water body.

**WW-9** Prior to final design, the Contractor shall prepare the final construction Runoff Management Plan (RMP). The plan shall address the final location of facilities to route and detain corridor runoff for the purpose of maintaining peak flows and flow velocities downstream of the Alignment at existing rates and preventing project pollutants from reaching improved and unimproved downstream drainages. County of Orange Best Management Practices (BMPs) will be included in these runoff facilities of the Alternatives as determined appropriate by the Design Engineer. The final RMP will contain provisions for changes to the plan (e.g., alternative mechanisms plant materials) if necessary during project design and/or construction phases to achieve the stated goals and performance standards at an equal or greater level. The RMP will address issues of detention and settlement basin design for mitigation requirements in relation to water quality. The plan shall be submitted to the RWQCB, Caltrans, and the Orange County Environmental Management Agency (OCEMA) Environmental Planning Division for review and comment. (RMP, Psomas 2003.)

**WW-10** The Contractor shall locate staging areas for construction equipment outside of areas in the jurisdiction of the Corps or CDFG to minimize impacts to sandy creek benches.

**WW-11** Prior to final design, the TCA or implementing agency shall prepare a jurisdictional delineation documenting the WoUS and wetlands, CDFG, and CCC jurisdictional impacts for the selected alternative.

Additional efforts have been contributed to identify appropriate off-site mitigation areas since certification of the Final SEIR. To compensate for unavoidable impacts to areas within the above-named regulatory jurisdictions, this comprehensive Habitat Mitigation and Monitoring Plan (HMMP) proposes to create and/or restore native grassland, wet meadow, mulefat scrub, southern willow woodland, and southern coast live oak/elderberry woodland habitats within approximately 215.8 ac in and adjacent to Chiquita Creek, located within the San Juan Creek watershed. The primary components of creation involve recontouring uplands that are adjacent to existing wetland/riparian areas in order to promote surface flow of water and restore the floodplain. The recontoured areas will be planted with a variety of wetland/riparian species. The primary components of restoration involve removing the non-native species and replanting the area with native plant species from perennial grassland and southern coast live oak/elderberry woodland communities.

Two general areas have been identified as excellent candidate locations for the creation and restoration wetland, riparian and upland watershed habitats. These areas include:

**Mitigation Area A.** Mitigation Area A consists of 20.80 ac and is adjacent to the alignment of the proposed project, south of Oso Parkway. Two principal areas have been identified for habitat restoration and creation along Chiquita Creek, which is bisected by Tesoro High School. These mitigation areas are immediately downstream of the Upper Chiquita Canyon Conservation Area. The mitigation will include the following:

- Restoration and creation of 4.66 ac of southern willow woodland;
- Restoration and creation of 4.90 ac of coastal sage scrub/native perennial grassland ecotone;

- Creation of 3.06 ac of mulefat scrub;
- Creation and substantial restoration of 7.31 ac of wet meadow; and
- Creation and restoration of 0.88 ac of oak/elderberry woodland.

**Mitigation Area B.** Mitigation Area B consists of 195 ac and is situated in the Upper Chiquita Canyon Conservation Area, which is currently managed by the TCA. This site is located south and east of the City of Rancho Santa Margarita and north and west of Oso Parkway. These 195 ac are proposed as part of the amendment to the existing Upper Chiquita Canyon Bank Agreement. The existing conservation bank was established with the TCA, USFWS, and CDFG in 1996 when the TCA purchased the conservation easement for Upper Chiquita Canyon from Rancho Mission Viejo (RMV). Under the initial bank agreement, 327 conservation credits were established for the preservation of existing coastal sage scrub habitat within the Conservation Area. These 327 conservation credits were to be used as mitigation for impacts to coastal sage scrub associated with the future FTC-S, which is the proposed project. Each conservation credit represented 1 ac of occupied coastal sage scrub habitat value that could be used toward future TCA projects. The conservation bank agreement establishes additional credits for the restoration and enhancement of appropriate habitats within the Conservation Area.

For the Preferred Alternative, 13 ac of riparian oak woodland restoration and 182 ac of native grassland restoration are proposed, for a total of 195 ac of mitigation in the Upper Chiquita Canyon Conservation Area. The mitigation will include the following:

- Restoration of 182 ac of native perennial grassland; and
- Restoration of 13 ac of riparian oak woodland.

Specifically, the mitigation approach will consist of a combination of (1) habitat restoration and creation within the Chiquita watershed as set forth in this Plan, and (2) upland watershed buffer enhancement, via restoration of native grasslands within the Upper Chiquita Canyon Conservation Area.

This creation and restoration program would increase habitat function, hydrologic function and water quality function of the drainages contributing naturally to the San Juan Creek Watershed.

## 2.7.5 CONCLUSION

A portion of the proposed project occurs within the Coastal Zone as defined by the CCC. CCC jurisdiction associated with the proposed project includes coastal wetlands within the San Mateo watershed. The proposed project will result in permanent impacts to approximately 0.46 ac and temporary impacts to approximately 6.44 ac of CCC jurisdiction. Impacts to CCC jurisdiction will be mitigated through the creation and/or restoration of native grassland, wet meadow, mulefat scrub, southern willow woodland, and southern coast live oak/elderberry woodland habitats in and adjacent to Chiquita Creek, located within the San Juan Creek watershed.

# 2.8 THREATENED AND ENDANGERED SPECIES

## 2.8.1 INTRODUCTION

The potential impacts of the proposed project to biological resources, including threatened and endangered species, are evaluated in detail. The Natural Environment Study (NES) (P&D Consultants, 2003), and are summarized in Sections 4.11 and 4.12 of the Final SEIR. The Biological Study Area for the SEIR is depicted in Figure 2.8-1.

Federally Threatened (FT), Federally Endangered (FE), State Threatened (ST), and State Endangered (SE) species observed in the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) study area include San Diego fairy shrimp *(Branchinecta sandiegonensis)* (FE), Riverside fairy shrimp *(Streptocephalus woottoni)* (FE), tidewater goby *(Eucyclogobius newberryi)* (FE), southern steelhead *(Oncorhynchus mykiss)* (FE), arroyo toad *(Bufo californicus)* (FE), southwestern willow flycatcher *(Empidonax traillii extimus)* (FE) (SE), coastal California gnatcatcher *(Polioptila californica californica)* (FT), least Bell's vireo *(Vireo bellii pusillus)* (FE) (SE), Pacific pocket mouse *(Perognathus longimembris pacificus)* (FE), and thread-leaved brodiaea *(Brodiaea filifolia)* (FT) (SE). Threatened and Endangered plant species that are known to occur in the project region but were not observed during multiple years of focused surveys within the study area include Braunton's milk-vetch *(Astragalus brauntonii)* (FE), Nevin's barberry *(Berberis nevinii)* (FE) (SE), spreading navarretia *(Navarretia fossalis)* (FT), Orcutt's grass *(Orcuttia californica)* (FE) (SE), and Gambel's watercress *(Nasturtium [Rorippa] gambelii)* (FE) (ST). Threatened and Endangered wildlife species that are known to occur in the project region but were not observed within the study area include the vernal pool fairy shrimp *(Branchinecta lynchi)* (FT), Quino checkerspot butterfly *(Euphydryas editha quino)* (FE), and California red-legged frog *(Rana aurora draytoni)* (FT). Threatened or Endangered species known to occur in the project region are listed in Table 2.8-A. The species that have been observed within the study area are discussed below. A detailed discussion of plant and wildlife species either present or not present is provided in the Natural Environment Study (NES) (P&D Consultants 2003).

## 2.8.2 SETTING

### Study Area Setting

The study area includes areas potentially affected by direct or indirect impacts from construction and use of the proposed project. Although the study area varies in width and extent, in no case was the study area boundary less than 0.40 kilometer (km) (0.25 mile [mi]) on either side of the centerline of the proposed project. In many cases, the biological study area extended well beyond 0.40 km (0.25 mi) on either side of the centerline so that other biological resources, such as wildlife corridors, can be evaluated on a landscape level. This was done to include an examination of potentially far-reaching and long-term impacts such as habitat fragmentation or downstream effects, which must be addressed in a broader spatial and temporal context. In this regard, the study provides a thorough and focused assessment of the entire area potentially affected.

LSA

FIGURE 2.8-1

County Boundary
City Boundary
Coastal Zone Boundary
Biological Study Area
Preferred Alternative (11/26/06)

SOURCE: EagleAerial (4/06); TCA (11/29/06); CCC (2005)

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*Foothill Transportation Corridor – South*
Biological Study Area

**Table 2.8-A: Threatened or Endangered Species Known to Occur in the Project Region**

| Scientific Name | Common Name | USFWS/CDFG | General Habitat Description | Habitat Present (P)/ Absent (A) | Rationale (Potential for Species to Occur) |
|---|---|---|---|---|---|
| **Plants** | | | | | |
| *Astragalus brauntonii* | Braunton's milk-vetch | FE/-- | Scattered locations in southern California foothills below approximately 640 meters (m) (2,100 feet [ft]) elevation; Ventura, Los Angeles, Orange counties; chaparral, often on carbonate soils; often follows fire or soil disturbance. | P | Species not present |
| *Berberis nevinii* | Nevin's barberry | FE/SE | Large, distinctive shrub that occurs in alluvial scrub habitat in Los Angeles, San Diego, and Riverside Counties with no recorded occurrences for Orange County. | P | Species not present |
| *Brodiaea filifolia* | thread-leaved brodiaea | FT/SE | Vernal pools and alkali sink in inland valleys; also on upland mesic clay soils nearer coast; hot spring soils at Arrowhead Hot Springs; scattered locations in foothills and valleys (Los Angeles County east to San Bernardino, south to San Diego County), below 610 m (2,000 ft) elevation. | P | Species present |
| *Navarretia fossalis* | spreading navarretia | FT/-- | Vernal pools in San Diego, Riverside, and Los Angeles Counties. | P | Species not present |
| *Orcuttia californica* | Orcutt's grass | FE/SE | Vernal pools in San Diego, Riverside, and Los Angeles Counties. | P | Species not present |
| *Nasturtium [Rorippa] gambelii* | Gambell's watercress | FE/ST | Marsh habitats. Presently, the only known occurrences of this species are from the San Luis Obispo area (Skinner and Pavlik 1994). | P | Species not present |

| Scientific Name | Common Name | USFWS/CDFG | General Habitat Description | Habitat Present (P)/ Absent (A) | Rationale (Potential for Species to Occur) |
|---|---|---|---|---|---|
| **Invertebrates** | | | | | |
| *Branchinecta lynchi* | vernal pool fairy shrimp | FT/-- | Seasonal vernal pools, ephemeral ponds, and stock ponds. | P | Species not present |
| *Branchinecta sandiegonensis* | San Diego fairy shrimp | FE/-- | Seasonal vernal pools, ephemeral ponds, and stock ponds. | P | Species present |
| *Euphydryas editha quino* | Quino checkerspot butterfly | FE/-- | Meadow habitats, clearings in scrub, or chaparral vegetation; often characterized by clay soils with low-growing herbaceous annuals. | P | Species not present |
| *Streptocephalus woottoni* | Riverside fairy shrimp | FE/-- | Deep, seasonal vernal pools, ephemeral ponds, and stock ponds. | P | Species present |
| **Fish** | | | | | |
| *Eucyclogobius newberryi* | tidewater goby | FE/-- | Coastal – brackish-water lagoons. | P | Species present |
| *Oncorhynchus mykiss* | southern steelhead | FE/-- | Freshwater streams/coastal lagoons. | P | Species present |
| **Amphibians** | | | | | |
| *Bufo californicus* | arroyo toad | FE/-- | Rivers with shallow, gravelly pools adjacent to sandy terraces. | P | Species present |
| *Rana aurora draytonii* | California red-legged frog | FT/-- | Riparian areas with intermittent streams and permanent ponds. | P | Species not present |
| **Birds** | | | | | |
| *Polioptila californica californica* | coastal California gnatcatcher | FT/-- | Coastal sage scrub. | P | Species present |
| *Empidonax traillii extimus* | southwestern willow flycatcher | FE/SE | Riparian habitats along rivers, streams, or other wetlands with dense growths of willows. | P | Species present |

| Scientific Name | Common Name | USFWS/CDFG | General Habitat Description | Habitat Present (P)/ Absent (A) | Rationale (Potential for Species to Occur) |
|---|---|---|---|---|---|
| *Vireo bellii pusillus* | least Bell's vireo | FE/SE | Riparian woodlands. | P | Species present |
| **Mammals** | | | | | |
| *Perognathus longimembris pacificus* | Pacific pocket mouse | FE/-- | Open coastal sage scrub and sandy substrates. | P | Species present |

**Federal Designations**
FE = Listed by the federal government as an Endangered species
FT = Listed by the federal government as a Threatened species

**State Designations**
SE = Listed by the State as an Endangered species
ST = Listed by the State as a Threatened species

Within the study area of the proposed project, a variety of upland and riparian plant communities are present within the Coastal Zone. These plant communities include coastal sage scrub (CSS), chaparral, grasslands, riparian, woodland, and agriculture and developed/disturbed communities.

### Coastal Zone Setting

The portion of the study area within the Coastal Zone contains many of the same resources described. These include the following vegetation types/wildlife habitats: coastal sage scrub (CSS), chaparral, grasslands, riparian areas, and areas disturbed by human activities (i.e., agriculture, existing roadways, landscaping). Resources associated with the coastal lagoons within the study area (San Mateo Lagoon and San Onofre Lagoon) are only found within the Coastal Zone area.

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

No additional information or reports pertaining to Threatened or Endangered species have been submitted to the Federal Highway Administration (FHWA) or the Transportation Corridor Agencies (TCA) since certification of the EIR.

## 2.8.3 IMPACTS

### Project Impacts

The following discussion focuses on potential impacts to State and federally listed Threatened and Endangered species that have been recorded within the study area of the proposed project. These species include the Riverside fairy shrimp, San Diego fairy shrimp, tidewater goby, southern steelhead, arroyo toad, southwestern willow flycatcher, coastal California gnatcatcher, least Bell's vireo, Pacific pocket mouse, and thread-leaved brodiaea.

**Fairy Shrimp.** Surveys for fairy shrimp performed in winter-spring 2001 and 2003 were conducted pursuant to United States Fish and Wildlife Service (USFWS) Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Federal Endangered Species Act (FESA) for the Listed Vernal Pool Branchiopods. Within the San Diego County portion of the study area, Riverside fairy shrimp were identified in one basin and San Diego fairy shrimp were identified in eight basins. These basins occur on a ridgeline west of Cristianitos Creek or along the bluff overlooking Surf Beach in San Onofre State Beach. In the Orange County portion of the proposed project, the San Diego fairy shrimp occurs in one location in the study area in three pools located south of Ortega Highway, approximately 686 m (2,250 ft) from the centerline of the proposed project. All of the basins occupied by the Riverside and San Diego fairy shrimp will be avoided by the proposed project.

**Tidewater Goby.** The tidewater goby is a small brackish-water fish that is listed as Endangered under the FESA. This fish lives in primarily coastal brackish-water lagoons along the California coastline. Populations of the tidewater goby in San Diego County exist in the San Mateo, San Onofre, Las Flores, Hidden, and Cocklebur Lagoons (Swift et al. 1993 and D. Kramer, pers. comm. 1997). A large population of tidewater gobies (137) was observed in San Mateo Lagoon, and one individual was caught in San Mateo Creek during the 1995 survey. In addition, a population of approximately 10,000 individuals is present in San Onofre Lagoon in the FTC-S study area (D. Kramer, pers. comm. 1997). There is the potential for this species to be affected during construction of the bridge structures over San Mateo and San Onofre Creeks.

**Southern Steelhead.** Southern steelhead is listed as Endangered under the FESA. All species of steelhead are anadromous; they spend most of their life in the sea and migrate into freshwater streams to spawn. The young hatch, spend a year or two in fresh water, and then return to the sea. In the FTC-S study area, the upstream migration occurs from December to April. Suitable habitat for this species is currently located mostly in the upper reaches of San Mateo and San Juan Creeks (outside the Coastal Zone) but was likely prevalent in the lower reaches historically. A detailed description of these reaches and their potential to support steelhead are discussed below.

**San Mateo Creek.** The San Mateo Creek watershed historically supported steelhead runs from the creek mouth up to 13 km (8 mi) upstream. At one time, San Mateo Creek was an important steelhead-producing stream to the extent that it supported significant local fisheries of both juveniles and adults (Hubbs 1946). Through the late 1940s, steelhead populations likely exceeded 10,000 individuals, and adults as large as 9 kilograms (kg) (20 pounds [lbs]) were observed. A February 2000 report prepared by California Department of Fish and Game (CDFG) for the National Marine Fisheries Service (NMFS) titled *Steelhead Rainbow Trout in San Mateo Creek, San Diego County*, describes changes in habitat conditions since the 1940s as follows: "There were fewer observations of juvenile steelhead/rainbow in San Mateo Creek after 1950. Trout were found from the lagoon to the headwaters at Los Alamos Canyon during a Department survey on September 1, 1979. Woelfel (1991) reported anecdotes of juvenile steelhead/rainbow presence in pools in the upper drainage during the early 1980s, and of a few steelhead adults captured by a local resident in the lower creek in 1986. However, no juvenile steelhead/rainbow were found in San Mateo Creek by Woelfel during surveys in 1987 and 1988."

In addition, CDFG biologists observed 78 steelhead in San Mateo Creek between March 3 and September 3, 1999. The majority of these observations occurred in the reach between the upper gauging station and the confluence with Devil Canyon Creek (located approximately 9.5 mi inland from the coast). Four steelhead were observed in San Mateo Creek above the confluence with Devil Canyon Creek, one of which was observed 4 km (2.5 mi) above the confluence. Four steelhead were observed in Devil Canyon Creek (CDFG 2000). CDFG did not conduct mark-and-recapture studies, so the precise population size cannot be estimated; however, it is believed to be quite low (CDFG 2000). However, the loss of riparian vegetation, widening of the stream channel, reduction in stream flows due to extensive groundwater extraction, and sediment deposition at key access points and within the historical spawning areas are considered important factors that have contributed to low species occurrence and obstructions to species migration within San Mateo Creek.

**San Juan Creek.** The CDFG has performed some fieldwork focused on the presence of native fish in the San Juan Creek watershed during recent years. However, no southern steelhead individuals were found during these surveys.

The potential presence of southern steelhead has been documented in the Arroyo Trabuco, a tributary to San Juan Creek, south of the I-5 underpass (CDFG, November 25, 2003, letter to the National Oceanic and Atmospheric Administration [NOAA]). The CDFG letter acknowledges that the I-5 underpass is a "complete barrier to upstream migration of steelhead" at this location. It is the TCA's understanding that genetic studies are currently underway to confirm the initial identification of steelhead in the Arroyo Trabuco; however, the results of these studies are not available at this time. Steelhead have not been documented in San Juan Creek within the study area limits during decades of various biological surveys along San Juan Creek, including surveys specifically designed to detect fish species. In addition, there is no anecdotal information from fishing records within San Juan Creek in Rancho Mission Viejo for the steelhead.

If certain environmental conditions occur (i.e., storm flows eliminate natural sediment barriers and provide for adequate water resources within the stream course), the steelhead could occur within San Juan Creek in the study area. However, in the existing condition, this species is not expected to occur due to lack of recent detection, limited historical occurrences, and possible barriers to upstream movement to or through the study area from the ocean.

**Steelhead Summary.** The presence of southern steelhead in the study area varies substantially on an annual basis. Conditions during most years are unsuitable for this species in the study area. Overall, the likelihood of the steelhead being present in the study area is low. This is primarily due to conditions in the creeks and watersheds, including groundwater extraction and subsequent reduced creek flows, sediment deposition at important entry and spawning areas, and manmade obstructions such as grade control structures within San Juan Creek and San Mateo Creek.

The likelihood of impacts on southern steelhead is extremely low; however, the possibility exists for the occasional presence of this species in the project area, especially during years with higher rainfall.

There is a very low potential for impacts to southern steelhead during construction activities along or across San Juan and San Mateo Creeks. Potential direct impacts to southern steelhead during spawning runs from construction could include disruption in breeding activities or removal of individuals. Physical activities in the stream could cause additional mortality of adults or dispersing juveniles through impacts on physical characteristics (substrate materials and creation of impediments to upstream improvements) of the stream that might occur during construction of the bridge structures. Implementation of the project will include construction minimization measures that will ensure continued access to upstream areas during construction. Therefore, the proposed project is not likely to adversely affect the steelhead.

The proposed project will not preclude fish dispersal or alter or significantly modify the bottoms of San Mateo Creek and/or San Juan Creek and associated riparian vegetation. Therefore, the proposed project would not directly preclude the return of the steelhead to these areas.

The proposed project will span San Mateo Creek and San Juan Creek. These features reflect consultation discussions with the USFWS, United States Army Corps of Engineers (Corps), and the United States Environmental Protection Agency (EPA) during the refinement process for the project regarding the design and location of bridge structures for all alternatives in the area. The road is elevated above the creeks, and water will flow around the column supports that maintain existing natural processes within the creek, resulting in negligible impacts. In an abundance of caution, precautionary mitigation measures were included in the Final SEIR.

Adverse water quality impacts to the southern steelhead will not occur due to implementation of the Runoff Management Plan (RMP). The proposed project includes design and project features to prevent these potential indirect impacts. Design measures required by the RMP would minimize impacts to erosion, siltation, and water quality degradation from runoff.

In addition, the existing I-5 crossings of San Mateo and San Onofre Creeks do not include runoff water treatment. The proposed project includes an extensive water quality best management practices (BMP) system as discussed in Section 2.6, Water Quality. Thus, with the proposed project in place, there will be an improvement in water quality within these areas, as all dry flows, all first flush storm flows, and most other storm flows will be treated through the BMPs prior to draining to San Mateo and San Onofre Creeks, which drain to the Pacific Ocean.

**Arroyo Toad.** The arroyo toad is listed as Endangered under the FESA. In the study area, arroyo toads were observed within San Juan, Gabino, San Mateo, and Cristianitos Creeks between 1996 and 2001. Arroyo toad populations were observed along San Juan Creek in Trampas Canyon in RMV during 2003 surveys. On MCB Camp Pendleton, San Onofre Creek is also known to support the arroyo toad, and it is likely that suitable habitat within this drainage occurs in the FTC-S study area. There is the potential for this species to be affected during construction of bridge structures and associated upland estivation areas; however, potential impacts to this species are prevented through a resource management plan that requires active monitoring and relocation during project construction.

**Southwestern Willow Flycatcher.** The southwestern willow flycatcher is listed as Endangered under the FESA. Although this species has been detected within the larger FTC-S study area, it was not detected within the study area of the proposed project. Although suitable habitat for this species occurs with San Mateo Creek and Cañada Gobernadora, only one territorial male flycatcher was observed in Cañada Gobernadora in 2001.

This species was not detected during protocol surveys and, therefore, would not be affected by the proposed project.

**Coastal California Gnatcatcher.** The coastal California gnatcatcher is listed as Threatened under the FESA. In the study area, gnatcatchers occur in CSS and a combination of scrub communities and

grassland habitats, usually dominated by California sagebrush.[1] A total of 15–17 gnatcatcher use areas will be affected as a result of the implementation of the proposed project.

**Least Bell's Vireo.** The least Bell's vireo is listed as Endangered under the FESA. Least Bell's vireos inhabit lowland riparian woodlands for primary foraging, breeding, and dispersal. Territorial least Bell's vireos were observed at 16 locations in the study area during the 1995 surveys. All but one of the observations occurred along San Mateo Creek; one sighting occurred along Cristianitos Creek. During the 2001 surveys, a minimum of 27 least Bell's vireo use areas were recorded in the study area. These included three in Cañada Chiquita, three in Cañada Gobernadora, one along San Juan Creek, two in Prima Deshecha Canyon, seven along Cristianitos Creek, at least seven along San Mateo Creek, and four on small tributaries to San Mateo Creek (in SOSB). All previously recorded least Bell's vireo locations in all impact areas of the various SOCTIIP alternatives were confirmed during 2003 focused surveys, and new observations along San Juan Creek in Trampas Canyon were recorded.

No least Bell's vireo location will be directly affected as a result of the implementation of the proposed project due to avoidance of occupied habitat by project design. In an abundance of caution, precautionary mitigation measures were included in the Final SEIR.

**Pacific Pocket Mouse.** The Pacific pocket mouse is listed as Endangered under the FESA. This subspecies is largely restricted to fairly open scrub communities and sandy substrates. The 1995 and 1996 trapping efforts for the Pacific pocket mouse identified one population of this subspecies in the FTC-S study area near the I-5 and Cristianitos Road interchange. Totals of 33 and 22 individuals were caught at this site during the 1995 and 1996 trapping programs, respectively. Trapping efforts in June and July 2001 resulted in the capture of three individuals (Stephen J. Montgomery, pers. comm.). A total of four individuals were trapped during the 2003 focused survey effort. This population is not within the direct impact area of the proposed project.

**Thread-leaved Brodiaea.** Thread-leaved brodiaea is listed as Threatened under the FESA. Thirty-four populations of thread-leaved brodiaea with over 4,400 individuals were identified in the FTC-S study area in 2001. Populations were observed on the ridgeline directly west of the Cañada Gobernadora mitigation area, on the east edge of the study area, near the west edge of the study area, west of Cristianitos Creek Road and north of Avenida Pico, near Talega west of The Donna O'Neill Land Conservancy, and north of Ortega Highway in Cañada Gobernadora and Cañada Chiquita. All of the observed populations are located outside the Coastal Zone. During 2003 surveys, additional populations were observed in Talega Canyon. Twenty-three plants from three populations will be directly affected by the proposed project.

[1] For ease of reading, scientific names for plant species (Latin) (except for those subject to the FESA) are not included in this document. Scientific names can be found in the NES.

### Impacts in Coastal Zone

The following discussion focuses on potential impacts to State and federally listed Threatened and Endangered species that have been recorded within the Coastal Zone portion of the study area of the proposed project. These species include the San Diego fairy shrimp, tidewater goby, southern steelhead, arroyo toad, southwestern willow flycatcher, coastal California gnatcatcher, least Bell's vireo, and Pacific pocket mouse.

Threatened and Endangered resources not present within the Coastal Zone include: Riverside fairy shrimp, southwestern willow flycatcher, Pacific pocket mouse, and thread-leaved brodiaea.

**San Diego Fairy Shrimp.** A total of 13 basins occur within the Coastal Zone portion of the proposed project study area along the bluff overlooking Surf Beach in San Onofre State Beach. Surveys for fairy shrimp conducted in 2001 and 2003 identified San Diego fairy shrimp in 7 of these 13 basins (Figure 2.8-2). These occupied basins are located more than 500 ft from the proposed project. Therefore, the habitat containing this species will be avoided by the proposed project.

**Tidewater Goby.** As discussed above, the tidewater goby is known to occur with the Coastal Zone portion of the proposed project study area within San Mateo Lagoon, San Mateo Creek, and San Onofre Lagoon (Figure 2.8-3). There is the potential for this species to be affected during construction of the bridge structures over San Mateo Creek and San Onofre Creek. However, San Mateo Lagoon and San Onofre Lagoon will not be directly impacted by the proposed project. Therefore, this species at these lagoon locations is not anticipated to be directly impacted; however, potential impacts to this species are prevented through a resource management plan that requires active monitoring and relocation during project construction.

**Southern Steelhead.** Within the Coastal Zone, San Mateo Creek contains potential habitat for this species (Figure 2.8-3). Although historically known to occur on a regular basis in San Mateo Creek, conditions during most years are unsuitable for this species, which is anticipated to occur in low and infrequent numbers.

Although the likelihood of impacts on southern steelhead is extremely low, the possibility exists for the occasional presence of this species in the project area, especially during years with higher rainfall.

During construction activities for the proposed project, there is a very low potential for impacts to southern steelhead during spawning runs or dispersal activities, which could disrupt breeding activities or remove individuals. Implementation of the proposed project will include construction minimization measures that will ensure continued access for the steelhead to upstream areas during construction. Therefore, the proposed project is not likely to adversely affect the steelhead.

The proposed project will not preclude fish dispersal or alter or significantly modify the bottoms of San Mateo Creek and associated riparian vegetation. San Mateo Creek will be spanned by the proposed project, and water will flow around the column supports, maintaining existing natural processes within the creek. Therefore, the proposed project would not directly preclude or hinder the

LSA

County Boundary

Coastal Zone Boundary

Preferred Alternative (11/26/06)

Fairy Shrimp (with IDs)

Unoccupied

Occupied by Listed Species

FIGURE 2.8-2

SOURCE: EagleAerial (4/06); TCA (11/29/06); CCC (2005); P&D Consultants (2001 & 2004); Glen Lukos Assoc. (2001, 3/07); Dudek (2001); Bonterra (2001); PSOMAS (2001); LSA (12/04)

I:\TCA430\GIS\CZ_FairyShrimp_Single.mxd (3/21/07)

*Foothill Transportation Corridor – South*

Fairy Shrimp

LSA

County Boundary

Coastal Zone Boundary

Preferred Alternative (11/26/06)

Southern Steelhead Habitat

San Mateo Creek Habitat

Tidewater Goby Populations/Final Critical Habitat

San Mateo Creek Population

San Onofre Creek Population

SOURCE: EagleAerial (4/06); TCA (11/29/06); CCC (2005); Bonterra (2001, 2006); USFWS (11/20/00)

I:\TCA430\GIS\CZ_SteelGoby_Single.mxd (3/21/07)

FIGURE 2.8-3

*Foothill Transportation Corridor – South*

Southern Steelhead and Tidewater Goby

return of the steelhead to this creek. In an abundance of caution, precautionary mitigation measures were included in the Final SEIR.

The RMP for the proposed project will address the potential adverse water quality issues relative to the southern steelhead as described above and in Section 2.6 of this document. The proposed project includes design and project features consistent with approved Caltrans standards and the RWQCB Water Quality Control Plans for the San Diego and Santa Ana Regions. The project may in fact benefit the steelhead by treating approximately 2 mi of existing Interstate 5 (I-5) surface runoff that currently enters San Mateo Creek untreated.

**Arroyo Toad.** Arroyo toad locations within the Coastal Zone are depicted on Figure 2.8-4. There is potential for this species to be affected during construction of the bridge structures over San Mateo and San Onofre Creeks and associated upland estivation areas; however, potential impacts to this species are prevented through a resource management plan that requires active monitoring and relocation during project construction.

**Coastal Sage Scrub and Coastal California Gnatcatcher.** The proposed project will impact approximately 49.75 acres of coastal sage scrub (CSS) habitat and three coastal California gnatcatcher use areas within the project's disturbance limit in the Coastal Zone (see Figure 2.8-5). Potential impacts to CSS are addressed through project mitigation measures and CSS and gnatcatcher programs tied to the implementation of the proposed project.

In 1996, TCA purchased a conservation easement for Upper Chiquita Canyon from Rancho Mission Viejo (hereafter referred to as the Conservation Area). The Conservation Area was originally under substantial threat for development; however, the TCA was able to conserve this area that would have been lost or substantially degraded by development in advance of the anticipated impacts from the FTC-S project. The Conservation Area consists of approximately 1,182 acres. Under the initial bank agreement, 327 conservation credits were established for the preservation of existing CSS within the Conservation Area. These 327 conservation credits were to be used as mitigation for impacts to CSS associated with the future FTC-S. Each conservation credit represented one acre of gnatcatcher-occupied CSS habitat value.

The Conservation Area is geographically located within the Orange County Southern Subregion of the Natural Communities Conservation Plan/Habitat Conservation Plan (NCCP/HCP), a conservation study area of approximately 132,000 acres. Planning of the NCCP/HCP anticipated the proposed project and its Conservation Area. The NCCP/HCP uses the Conservation Area and its resources to achieve the conservation goals and objectives for CSS and gnatcatcher preservation by the USFWS.

The USFWS has determined that the NCCP/HCP will (1) "contribute to the survival and recovery of the California gnatcatcher in the Southern Subregion and contribute [to] its recovery on a rangewide basis," (2) provide for maintaining net habitat value and increasing gnatcatcher populations through restoration actions, and (3) benefit the species over the long-term. A critical aspect of the NCCP/HCP that benefits and contributes to the recovery of the gnatcatcher is the preservation of the Conservation Area, which is considered by the USFWS as a key location for the gnatcatcher.

LSA

FIGURE 2.8-4

County Boundary

Coastal Zone Boundary

Preferred Alternative (11/26/06)

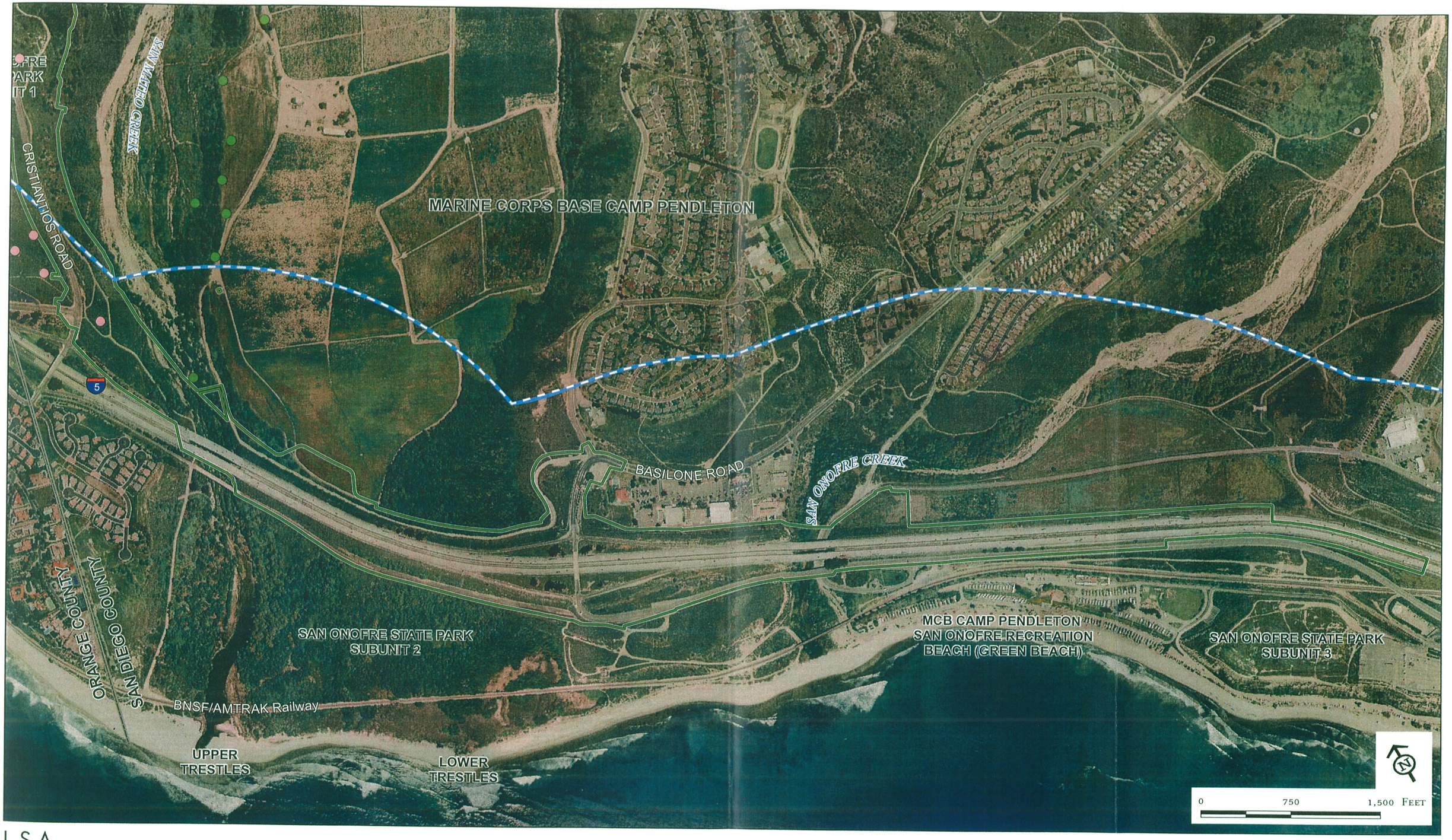
Arroyo Toad Locations

SOURCE: EagleAerial (4/06); TCA (11/29/06); CCC (2005); P&D Consultants (2001 & 2004); PSOMAS (2001); LSA (12/04)

I:\TCA430\GIS\CZ_ArroyoToad_Single.mxd (3/21/07)

*Foothill Transportation Corridor – South*

Arroyo Toad




LSA

FIGURE 2.8-5

County Boundary

Coastal Zone Boundary

Preferred Alternative (11/26/06)

California Gnatcatcher

Least Bell's Vireo

SOURCE: EagleAerial (4/2006); CDMG (11/29/06); CCC (2005); P&D Consultants (2001 & 2004); PSOMAS (2001); LSA (12/04)

I:\TCA430\GIS\CZ_Birds_Single.mxd (3/23/07)

*Foothill Transportation Corridor – South*

Birds

The gnatcatchers present in the Conservation Area represent the northern portion of the gnatcatcher population in a key location in the Chiquita Canyon, Western Gobernadora/Chiquadora Ridge, and Wagon Wheel area (Draft NCCP/HCP Planning Guidelines, April 2003). These areas are "integral to the overall function of the reserve for this species because they provide linkage to other populations, including Camp Pendleton (Draft NCCP/HCP Planning Guidelines, April 2003)."

Gnatcatcher conservation efforts are directed at preserving relatively large, contiguous patches of CSS suitable for gnatcatchers (Service 1993, 2000, 2003). In the Southern Subregion, the gnatcatcher is at recovery levels. In addition to a hard-line reserve, in the Southern Subregion, conservation efforts are directed at maintaining connectivity (protecting gnatcatcher movement corridors) and adaptive management, including enhancement and/or restoration of habitat, long-term fire management, control of invasive species, and ongoing management of stressors. (Service 2006).

The gnatcatcher and its habitat "have already been substantially conserved in coastal southern California" through several NCCPs and HCPs, and substantial populations exist on federal lands (Service, 2006). "Approximately 54 to 66 percent of the total estimated population occurs in areas that are already conserved or highly likely to be conserved. Another 14–18 percent occurs in pending NCCP areas, and a high percentage of these will ultimately be conserved permanently." (LSA 2004). "The gnatcatcher is already at recovery levels within the [Southern] Subregion." The Southern Subregion NCCP is expected to contribute significantly to recovery on a regional basis (Service 2006). The Southern Subregion NCCP Biological Opinion was issued on January 10, 2007.

Additionally, MCB Camp Pendleton has an Integrated Natural Resource Management Plan (INRMP) that identifies the program policies, goals, objectives, planned actions, and timelines for the implementation of natural resources management on MCB Camp Pendleton. The INRMP serves as a reference document and management tool for the base relative to the natural resources management programs with ongoing development, review, and implementation by base personnel, the USFWS, and the CDFG. As required by federal law, the INRMP provides for (1) the conservation and rehabilitation of natural resources, (2) the sustainable multipurpose use of natural resources, and (3) limited public access to military installations to facilitate the use of these resources. The INRMP includes an ecosystem-based approach to land management and is intended to facilitate maximum support for the base's military training mission and infrastructure while simultaneously promoting both the sustainability of native species and habitat diversity and compliance with applicable laws and regulations. Camp Pendleton sees its primary stewardship responsibilities to ensure the long-term landscape diversity required and to support the military training mission and regional biodiversity.

Together, INRMP and the NCCP/HCP provide regional continuity to conservation efforts, and enhancements to this regional conservation block have higher habitat values than those resources located within the FTC-S disturbance limit. Therefore, conservation of habitat in Upper Chiquita for impacts within the FTC-S disturbance limit provide a net increase in habitat value, making FTC-S consistent with Section 30240. Additionally, MCB Camp Pendleton has stipulated that no habitat mitigation program can be located within the boundary of MCB Camp Pendleton.

**Least Bell's Vireo.** Within the Coastal Zone, one territory of the least Bell's vireo was identified within San Mateo Creek. This territory will be avoided by the bridge structure for the proposed

project. Therefore, there are no direct or indirect impacts to this species as a result of implementation of the proposed project, due to avoidance of occupied habitat by project design. (See Figure 2.8-5.)

## 2.8.4 MITIGATION

### San Diego and Riverside Fairy Shrimp

The proposed project will not directly or indirectly impact the San Diego or Riverside fairy shrimp or the habitat for these species. Project design and drainage features will prevent adverse effects of runoff, erosion, or sedimentation, which will result in maintaining existing characteristics and functions of the watersheds. Therefore, no mitigation is required for these species.

The Final SEIR includes mitigation measures that address potential impacts to several species. These measures are summarized below with their corresponding Final SEIR measure number.

- Identification/Responsibilities of the Project Biologist (WW 1)
- Project Biologist Review of Project Design (WW 2)
- Preparation and Implementation of a Biological Resources Management Plan (BRMP) (WW 3)
- Identification and Implementation of Environmentally Sensitive Areas (ESAs) (WW 4)
- Installation of Protective Fencing and Other Protective Measures (WW 5)
- Biological Monitoring/Documentation (WW 5)
- Restoration of River/Stream Hydrology (WW 6)
- Preconstruction Educational Meetings (WV 6)
- Construction Storage (WW 7)
- Construction Disposal (WW 8)
- Implementation of Water Quality Protection Measures (WW 9)
- Construction Staging Areas (WW 10)

The full text of these biological measures is provided below.

**WW-1** Prior to construction, the TCA or other implementing agency/agencies shall designate a Project Biologist responsible for overseeing biological monitoring, regulatory compliance, and restoration activities associated with construction of the selected alternative in accordance with the adopted mitigation measures and applicable law.

**WW-2** During final design of the project, the Project Biologist shall review the design plans and make recommendations for avoidance and minimization of sensitive biological resources. The TCA or other implementing agency/agencies Environmental and Engineering Staff shall determine the implementation of those recommendations.

**WW-3** A Biological Resources Management Plan (BRMP) shall be prepared prior to construction. The BRMP shall provide specific design and implementation features of the biological resources mitigation measures outlined in the resource agency approval documents. Issues during construction and operation to be addressed in the BRMP shall include, but are not limited to, resource avoidance, minimization, and restoration guidelines, performance standards, maintenance criteria, and monitoring requirements. The Draft BRMP shall be submitted to the USFWS, National Marine Fisheries Service (NMFS), CDFG, USACOE, RWQCB, FHWA, the California Coastal Commission, and Caltrans for review to the extent required by permit by such agencies.

The primary goal of the BRMP will be to ensure the long-term perpetuation of the existing diversity of habitats through restoration in the project area and adjacent urban interface zones and to prevent offsite or indirect effects. The BRMP shall contain at a minimum the following:

a. Identification of all Environmental Sensitive Areas (ESA). ESAs are defined as sensitive habitats including, but not limited to, areas subject to the jurisdiction of the CDFG, USACOE, and USFWS.

b. Design of protective fencing (i.e., t-bar or yellow rope) around ESAs and the construction staging areas.

c. Locations of trees to be protected as wildlife habitat (roosting sites).

d. For areas that will be restored, the quality of the adjacent habitat will be characterized. This characterization shall include species composition, density, coverage, and presence of nonnatives. This characterization will provide a baseline to compare the success of the restoration. The site preparation plan for each restoration site will include:

   - Sources of plant materials and methods of propagation.
   - Site preparation (clearing, grading, weed eradication, soil amendment, topsoil storage), irrigation, planting (container plantings, seeding), and maintenance (weed control, irrigation system checks, replanting) of restoration areas. Specification of parameters for maintenance and monitoring of restoration areas, including weed control measures, frequency of field checks, and monitoring reports for temporary disturbance areas within the right-of-way.
   - Remedial measures to be taken if performance standards are not met.
   - Methods and requirements for monitoring of the restoration efforts.
   - Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within restoration areas.

e. Specific measures for the protection of sensitive habitats to be preserved in and adjacent to the right-of-way to ensure that construction does not increase beyond the

impacts identified in the EIS/SEIR. These measures will include, but are not limited to, erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements. Details of the erosion, siltation, and dust control mitigation measures will be provided in the Storm Water Pollution Prevention Plan (SWPPP).

**WW-4** In conjunction with the development of final plans and specifications for construction, or other activities involving vegetation/habitat removal, the Project Biologist shall review and approve the contractor's map of all sensitive habitats (Environmentally Sensitive Areas) within 152.4 meters (500 feet) of the grading limits on the grading plans. The ESA maps shall be prepared by the construction contractor's qualified biologist and approved by the TCA or other implementing agency/agencies. All ESAs to be avoided and performance standards established by the resource agencies shall be clearly noted on the grading, construction, and landscape plans. Additionally, the landscape plans shall indicate that plant materials be local southern Orange County natives.

**WW-5** During grading activities and construction operations, the Project Biologist shall conduct monitoring within and adjacent to sensitive habitats including monitoring of the installation of protective devices (silt fencing, sandbags, fencing, etc.), installation and/or removal of creek crossing fill, construction of access roads, vegetation removal, column installation, falsework installation and removal, and other associated construction activities, as deemed appropriate by the Project Biologist. Biological monitoring shall be conducted to document adherence to habitat avoidance and minimization measures addressed in the project mitigation measures and as listed in the USFWS, CDFG, and USACOE permits/agreements.

**WW-6** Final design and construction shall restore the perennial river and stream channels and ephemeral drainages and washes to their original contours upon completion of construction where feasible, with the exclusion of areas of permanent impact.

**WV-6** Prior to the commencement of grading activities or other activities involving vegetation/habitat removal, the Project Biologist shall attend preconstruction meetings with construction foremen, bridge engineers, and the TCA or other implementing agencies to confirm that all environmental conditions are discussed. Monthly, or on an as needed basis, new construction personnel shall complete an educational program. Issues to be covered will include, but are not limited to, environmental measures for avoiding impacts to sensitive biological resources, ESAs, waste disposal, vehicle transportation routes, seasonal restrictions, fueling/maintenance restrictions, and other relevant topics.

**WW-7** During all construction activities, the Contractor shall ensure that construction equipment or vehicles shall not be stored in areas defined as ESAs, including areas within the jurisdiction of the USACOE and/or CDFG. There shall be no fueling, lubrication, storage, or maintenance of construction equipment within 46 meters (150 feet) of CDFG or USACOE jurisdictional areas. Construction equipment staging/storage shall be located in previously disturbed or non-native areas to the maximum extent possible.

**WW-8** During all construction activities, the Contractor shall ensure that no waste material shall be discharged to any CDFG or USACOE jurisdictional areas. Spoil sites shall not be located within any CDFG or USACOE jurisdictional areas, or in areas where it could be washed into any surface water body.

**WW-9** Prior to final design, the Contractor shall prepare the final construction Runoff Management Plan (RMP). The plan shall address the final location of facilities to route and detain corridor runoff for the purpose of maintaining peak flows and flow velocities downstream of the Alignment at existing rates and preventing project pollutants from reaching improved and unimproved downstream drainages. County of Orange Best Management Practices (BMPs) will be included in these runoff facilities of the Alternatives as determined appropriate by the Design Engineer. The final RMP will contain provisions for changes to the plan (e.g., alternative mechanisms plant materials) if necessary during project design and/or construction phases to achieve the stated goals and performance standards at an equal or greater level. The RMP will address issues of detention and settlement basin design for mitigation requirements in relation to water quality. The plan shall be submitted to the Regional Water Quality Control Board (RWQCB), Caltrans, and the Orange County Environmental Management Agency (OCEMA) Environmental Planning Division for review and comment. (RMP, Psomas 2003.)

**WW 10** The Contractor shall locate staging areas for construction equipment outside of areas in the jurisdiction of the USACOE or CDFG to minimize impacts to sandy creek benches.

### Tidewater Goby

In the Final Subsequent Environmental Impact Report (SEIR) and the NES, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts to the tidewater goby.

- Design and Installation of Wildlife Movement Corridor Bridges and Culverts (WV 15)
- Installation of Fish Navigable Creek Crossings (WV 21)
- Invasive Plant Species Minimization (WV 27, 28, and 29)

**WV-15** Prior to final design of the selected alternative, the Project Biologist shall ensure that the location of the proposed wildlife bridges and culvert identified in the NES will provide adequate travel capabilities, contain adequate vegetation cover, have adequate daylight, and have appropriate fencing to encourage animals to use these underpasses. Upon selection of and refinement to, the selected alternative, smaller culverts and bridges that will be necessary to provide drainage and/or avoid impacts to jurisdictional areas shall also be designed, at the direction of the Project Biologist, to promote local and regional wildlife movement.

**WV-21** During final design, the TCA or other implementing agencies, in coordination with the RMP, shall design, construct, and/or maintain any structure/culvert placed within a

stream where sensitive fish species do/may occur such that it does not constitute a barrier to upstream or downstream movement of aquatic life, or cause an avoidance reaction by fish that impedes their upstream or downstream movement. This includes, but is not limited to, the supply of water at an appropriate depth for fish migration.

**WV-27** Before entering or leaving the construction site, all construction equipment shall be inspected for evidence of invasive species and/or their seeds. Should any plants and/or seeds be detected, the equipment will be washed to ensure no invasive species and/or their seeds will be brought into or removed from the site.

**WV-28** Prior to construction, substantial populations of invasive plant species identified on the State of California List of Noxious Weed Species and the California Exotic Pest Plant Council Exotic Pest Plants (CalEPPC) of Greatest Ecological Concern in California List adjacent to the grading limits shall be mapped.

**WV-29** The Project Biologist shall prepare an invasive species management program to be incorporated into the BRMP. The program shall discuss the invasive species within landscaping and mitigation areas to be eradicated or controlled and eradication methods, which may include mowing, hand removal, or herbicide application. Removal of invasive plant species on the State of California List of Noxious Weed Species with Pest Rating A shall be required, at the direction of the Project Biologist. Eradication, containment, or control of all invasive plant species on the State of California List of Noxious Weed Species with Pest Rating B shall be at the discretion of the Project Biologist. The program shall also address invasive species identified in the California Exotic Pest Plant Council Exotic Pest Plants of Greatest Ecological Concern in California List and methods for their control. The potential for contribution of funds to such programs as the Arundo Removal Program to assist with removal of giant reed or other species from riparian habitats such as San Juan Creek shall also be addressed. The program shall also discuss monitoring of the landscaped and mitigation areas to ensure invasive species are properly controlled or eradicated. The maintenance of the mitigation sites along the corridor will be under the supervision of the Project Biologist (Executive Order 13112, Feb. 3, 1999).

In Section 4.12 of the Final SEIR, *Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species*, Measure TE 9 addresses the biological resource needs of the tidewater goby. Measure TE 9 has been included below:

**TE-9** During final design, the TCA or other implementing agencies, in coordination with the RMP, shall design, construct, and/or maintain any structure/culvert placed within a stream where Endangered or Threatened fish do/may occur such that it does not constitute a barrier to upstream or downstream movement of aquatic life, or cause an avoidance reaction by fish that impedes their upstream or downstream movement. This includes, but is not limited to, the supply of water at an appropriate depth for fish migration.

### Southern Steelhead

Although historically known to occur on a regular basis in San Mateo Creek, conditions during most years are unsuitable for this species; however, in an abundance of caution, several minimization and avoidance measures were identified in the Final SEIR that relate directly or indirectly to potential impacts on the southern steelhead. These measures will provide for habitat protection and management which will, in the long term, provide the required avoidance and minimization for the steelhead potentially within or downstream from the proposed project. These avoidance and minimization measures are provided above under the tidewater goby discussion.

Mitigation Measure TE 9 of the Final SEIR addresses the biological resource needs of the southern steelhead, as provided above.

Avoidance and minimization measures that could be implemented during construction may include installation of sheet pile cofferdams to contain construction activities at the San Juan Creek and San Mateo Creek stream crossings. A cofferdam is a small structure around the proposed bridge column supports to isolate the construction area. Cofferdams contain the disturbed soil area, preventing siltation of the stream flow while allowing the flow of water around the imbedded sheet piles, thus maintaining an uncontaminated supply of water for southern steelhead.

### Arroyo Toad

In the Final SEIR, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts on the arroyo toad. These avoidance and minimization measures are provided above under the tidewater goby discussion.

In Section 4.12 of the Final SEIR, *Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species*, Measures TE 10 through 17 have been developed, and as a result, avoid impacts to the arroyo toad, as follows:

**TE 10** An Arroyo Toad Resource Management Plan (ATRMP) will be prepared, incorporated into the BRMP, and monitored by the Project Biologist. The plan shall include measures detailing how the impact area will be surrounded with a silt fence enclosure, from which arroyo toads will be removed and relocated from the construction impact area during the breeding season (when they are detectable by vocalizations) and placed in suitable habitat either upstream or downstream of the selected alternative during construction. The ATRMP will identify areas of collection, suitable areas for temporary storage, and restoration guidelines to be in place prior to release of the toad to their original location. The plan shall by submitted to and approved by the USFWS. The locations of areas known to support arroyo toads shall be identified in the ATRMP and on the ESA maps.

**TE 11** Prior to initiating any ground-disturbing activities in occupied/suitable habitats or habitats proximal to suitable or occupied habitats, exclusionary fencing shall be installed around the perimeter of the construction area. Fencing or screening approximately 60 cm (two ft) in height (30 cm [one ft] of which will be buried below the surface) shall be installed to prevent arroyo toads from entering the area after the onset of construction. The fencing will be installed at least 14 days prior to the initiation of work and must be

made of a material appropriate to preclude any arroyo toads from entering the construction area. Fencing will be removed each winter during construction and at the end of project construction. Vehicle use will be restricted within areas known to support populations of the arroyo toad as reflected on the ESA maps.

**TE 12**

a) The Project Biologist shall conduct three focused arroyo toad surveys within the fenced construction site for arroyo toads a minimum of 14 nights prior to initiating project construction. If climatic conditions are not appropriate for arroyo toad movement during the surveys, the Project Biologist may attempt to illicit a response from the arroyo toads, during nights with temperatures of 13 °C (55 °F) or greater, by spraying the project area with water to simulate a rain event. During construction, arroyo toads surveys will be performed a minimum of once per week and on all nights where the combination of rain/humidity and temperature would increase the movement of arroyo toads.

b) If arroyo toads are found with the construction side of the exclusionary fencing, arroyo toads will be removed by the Project Biologist and relocated from the construction impact area and placed in suitable habitat either upstream or downstream of the construction area as outlined in the Arroyo Toad Resource Management Plan.

**TE 13** The Contractor shall locate staging areas for construction equipment outside of areas within the jurisdiction of the USACOE or CDFG known to support arroyo toad to minimize impacts to sandy creek benches that may provide aestivating habitat for the arroyo toad to avoid taking any individuals.

**TE 14** When conducting construction and/or other ground-disturbing activities in arroyo toad-occupied habitats or in adjacent upland areas proximal to known arroyo toad habitats, the Contractor shall cover all grubbing spoils or other grading debris with plastic sheeting to prevent arroyo toads from opportunistically burrowing in these exposed and friable soil piles. This sheeting must be placed on the soil piles before sunset and shall remain on (during nighttime hours) for the duration of the construction/ground disturbing activities. The areas where these measures must be implemented shall be determined by the Project Biologist in coordination with the USFWS. If the sheeting does not remain in place due to unforeseen circumstances, (inclement weather or other disturbances) a biologist will monitor the soil piles for the arroyo toad.

**TE 15** The Contractor shall not drive upon construction roads or other roads/surfaces adjacent to arroyo toad occupied habitat after sunset. If the site must be accessed, a biologist permitted to handle arroyo toad must be present in the vehicle to identify any individuals on the road and the vehicle shall not exceed a speed of 16 km per hour (10 mi per hour) within these areas.

**TE 16** At the conclusion of construction, the TCA or other implementing agencies shall construct artificial pools and gravel bars within the temporary disturbance areas of creeks that are known to be occupied by arroyo toad. The artificial pools and gravel bars shall provide potential breeding and aestivating habitat for arroyo toad. These areas will be

identified and established by the Project Biologist in the BRMP. Because of the natural flooding and scouring conditions of the creeks within the study area, no maintenance of these areas will be required. The construction of these features shall not preclude required Caltrans bridge maintenance. Plans shall be submitted to USFWS for review and approval prior to implementation.

**TE 17** Prior to the arroyo toads' re-establishment to their original locations, specific activities to enhance their habitat and improve their potential for re-occupation will be implemented. These measures include the removal (up to 15 days in advance of the re-establishment), to the extent practicable, of predatory species such as bullfrogs, western mosquito fish, yellow bullheads, bluegill, and additional predatory invertebrates, amphibians, and introduced fish species. Plans shall be submitted to USFWS for review and approval prior to implementation.

While there is the potential for the proposed project to affect arroyo toad, this potential impact is prevented with implementation of the mitigation measures identified above.

### Southwestern Willow Flycatcher

The proposed project will not directly or indirectly impact the southwestern willow flycatcher. Therefore, there are no mitigation measures required specific to this species.

### Coastal California Gnatcatcher

In the Final SEIR, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts on the coastal California gnatcatcher. These measures, provided in WW 1 through WW 5, WW 10, and WV 27 through 29, identify conceptual avoidance, protective, and compensatory measures to offset potential adverse impacts on the gnatcatcher by the proposed project. These measures will be refined in the BRMP subject to USFWS, Corps, and CDFG review and approval, and consistent with any resource agency approval documentation. The measures in the BRMP shall be detailed to the design level and will provide performance standards and goals with a commitment to an appropriate level of avoidance, minimization, and compensation. The TCA continues to discuss and refine the biological resource avoidance and minimization measures for the proposed project in the context of the project impacts and other major governmental actions anticipated in the study area (i.e., the Special Area Management Plan [SAMP], Natural Communities Conservation Plan [NCCP], and the Rancho Mission Viejo [RMV] development plan). (See earlier discussion in section 2.8.3).

In Section 4.12 of the Final SEIR, *Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species,* Measures TE 18, 19 and 25 have been developed to avoid or minimize impacts to the coastal California gnatcatcher, as shown below.

**TE 18** To minimize and offset adverse effects of the selected alternative on the coastal California gnatcatcher, habitat suitable for this species (as determined by the Project Biologist) shall be grubbed from the project footprint area from September to February if feasible (generally outside the breeding season for these species). The Project Biologist

shall survey the suitable habitat within the areas to be grubbed one day prior to any vegetation disturbance to determine the location and numbers of coastal California gnatcatchers. The Project Biologist will be on-site and present during all suitable habitat clearing and removal activities to minimize the potential for individual coastal California gnatcatchers to be wounded or killed during the clearing of habitat.

**TE 19** If grubbing activities are unavoidable during the coastal California gnatcatcher breeding season, which is between February and August, the following measures will be implemented:

a. Surveys by the Project Biologist will be conducted a minimum of three times on separate days after the initiation of the nesting season to determine the presence of coastal California gnatcatchers, nest building activities, egg incubation activities, or brood rearing activities. These surveys will be conducted within the week prior to the initiation of brushing, grading, or other construction activities. One survey will be conducted the day immediately prior to the initiation of work. The USFWS will be notified in writing seven days prior to the initiation of surveys.

b. If no nest(s), nesting behavior, or brood rearing activities are detected, work may commence. Prior to and during work activities, the Project Biologist will locate any individual coastal California gnatcatchers on-site and direct operators to begin in an area away from the birds. The pattern of brushing/grubbing activities will be designed to optimize opportunities for flushed birds to be directed towards the open space areas in the vicinity of the impact area.

c. During construction, no activity will occur within approximately 150 m (500 ft) of active nests.

**TE 25** To partially mitigate impacts, the TCA has identified additional habitat preservation and restoration activities in the Upper Chiquita Canyon Conservation Area. The Upper Chiquita Canyon Conservation Area consists of approximately 478.7 ha (1,182 ac) created by the TCA to mitigate biological impacts resulting from construction of the FTC-N. Of these 478.7 ha (1,182 ac), 327 credits have been set aside as a mitigation bank for future project impacts. The Conservation Area was originally under substantial threat for development and the resources within the Area have been conserved, but otherwise would have been lost or substantially degraded. In addition, the Upper Chiquita Canyon Conservation Area provides opportunities for preservation activities consisting of additional habitat for oak woodland and sensitive plant species. There are also opportunities for restoration activities on site that would include additional acres of oak woodland, nonwetland drainages, CSS, CSS/native perennial grassland ecotone, and native perennial grassland habitats. These opportunities for preservation and restoration activities would also serve to mitigate impacts on sensitive plants for the SOCTIIP Alternatives.

a. Impacts to scrub communities (and all sub-types thereof except floodplain sage scrub) shall be mitigated through the use of scrub mitigation credits in the Upper Chiquita Canyon Conservation Easement area and additional preservation (if

necessary). The Upper Chiquita Canyon Conservation Easement area currently contains 327 mitigation credits approved by the USFWS and CDFG. The scrub areas impacted by the selected alternative will be mitigated at a credit to hectare ratio of 1:0.40 (one Upper Chiquita Canyon Conservation Easement mitigation credit for every 0.40 ha impact or one Upper Chiquita Canyon Conservation Easement mitigation credit for every 1.0 ac lost).

b. Any additional scrub areas restored within the Upper Chiquita Canyon Conservation Easement area may be added to the credit total, with the approval of the USFWS, and applied to the mitigation ratio accordingly. The TCA or other implementing agencies and the USFWS shall determine the criteria for the establishment of the new credits for the restored areas pursuant to the Upper Chiquita Canyon Conservation Bank Agreement which was entered into with the USFWS and the CDFG.

c. Any scrub areas that are impacted by the selected alignment and that have not been mitigated by the use of the Upper Chiquita Canyon Conservation Easement mitigation credits (i.e., impact area exceeds mitigation credits available) shall be mitigated through preservation at a ratio of 1:1.

### Least Bell's Vireo

Impacts to least Bell's vireo are not anticipated as a result of project implementation. However, in an abundance of caution, the Final SEIR identifies several minimization and avoidance measures that relate directly or indirectly to potential impacts to the least Bell's vireo. These measures are provided in WW 1 through WW 5, WW 10, and WV 27 through 29. In addition, in Section 4.12 of the Final SEIR, *Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species,* Measures TE 20, 21, and 22 have been developed to avoid or minimize impacts to the least Bell's vireo, as follows:

**TE 20** To minimize and offset adverse effects of the selected alternative on the least Bell's vireo, suitable habitat for this species, as determined by the Project Biologist, shall be grubbed from the impact area from 16 September to 14 March (generally outside the breeding season for this species).

**TE 21** If grubbing activities between 15 March and 15 September (generally within the breeding season for the least Bell's vireo) are unavoidable, the following contingency measures will be implemented:

a) Surveys by the Project Biologist will be conducted a minimum of three times on separate days after the initiation of the nesting season to determine the presence of least Bell's vireos, nest building activities, egg incubation activities, or brood rearing activities. These surveys will be conducted within the week prior to the initiation of brushing, grading, or other construction activities. One survey will be conducted the day immediately prior to the initiation of work. The USFWS will be notified in writing prior to the initiation of surveys.

b) If no nest(s), nesting behavior, or brood rearing activities are detected, work may commence. Prior to and during work activities, the Project Biologist will locate any individual least Bell's vireos on-site and direct operators to begin in an area away from the birds. The pattern of brushing/grubbing activities will be designed to optimize opportunities for flushed birds to be directed towards the open space areas in the vicinity of the impact area.

c) During construction, no activity will occur within approximately 150 m (500 ft) of active nests.

**TE 22** a) To minimize indirect disturbance of nesting least Bell's vireos, the Contractor will not engage in any construction activities within 61 m (200 ft) of occupied least Bell's vireo habitat between the hours of 0600 and 1100 every day during the peak nesting period of 1 April to 15 July of any given calendar year if said construction activities result in noise readings greater than 60 dBA measured at the edge of the territory of the vireo in the area.

b) For construction, temporary or permanent noise barriers may be installed under the direction of the Project Biologist and USFWS to reduce noise levels. The Project Biologist shall be responsible for monitoring the noise level.

c) The Project Biologist shall be responsible for all noise monitoring reports which shall include, at a minimum, (1) baseline noise measurements at known least Bell's vireo nesting sites within riparian communities within the impacts area, prior to construction, (2) the effect construction noise has on nesting pairs in the vicinity of construction, (3) baseline noise measurements at known nesting adjacent to the alignment, prior to traffic, and (4) the effect traffic noise has on nesting pairs in the vicinity of the selected alignment. These reports will be submitted to the TCA or other implementing agencies.

**TE 28** Impacts to riparian scrub, woodland, and forest communities (as defined in Section 5.0 of the NES) shall be mitigated by mitigation of such communities at a 1:1 ratio or other ratio that compensates for functions and values. Mitigation areas shall occur within dedicated open space areas including, but not limited to, the Upper Chiquita Canyon Conservation Easement area as determined by the Project Biologist. The restoration program shall be detailed with the BRMP.

Prior to restoration of these communities, hydrological testing and monitoring of the creation site shall be conducted to determine that sufficient hydrology exists to support the community. If necessary, a temporary irrigation program shall be incorporated into the mitigation design to ensure successful establishment of the community.

The following performance standards shall apply for the restoration of these areas (except for southern coast live oak riparian forest). Restoration shall be considered successful if:

- The site does not require substantial maintenance for at least two consecutive years during the monitoring period.
- The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.
- Absolute percent cover of native upper and mid canopy species is 70 percent.
- An index of species diversity of the restored areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.

For southern coast live oak riparian forest, the following standards shall apply:

- The site does not require substantial maintenance and meets the success criteria established for this community for at least two consecutive years during the monitoring period.
- The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.
- Absolute percent cover of native upper and mid canopy species is 50 percent, with five percent cover from oak trees.
- An index of species diversity of the restored areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.

Monitoring shall be conducted for a minimum of five years to ensure successful establishment of the restored areas. If success standards are not met, remedial measures including introduction of additional container stock and adjusting of irrigation shall be implemented as directed by the Project Biologist.

### Pacific Pocket Mouse

In the Final SEIR, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts the Pacific pocket mouse. Pacific Pocket Mouse was not found in the Coastal Zone; however, this species occur adjacent to the Coastal Zone in SOSB Subunit 1. These measures are provided in WW 1 through WW 5, WW 10, WV 15, and WV 27 through 29. In Section 4.12 of the Final SEIR, *Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species*, Measures TE 23 and 24 have been addressed for those issues critical to the biological resource needs of the Pacific pocket mouse. Measures TE 23 and 24 have been included below:

**TE 23** During final project design, an undercrossing shall be provided in the vicinity of the San Mateo North population of the Pacific pocket mouse for any alternative selected that occurs within this area. The undercrossing shall allow for potential movement of Pacific pocket mice under the alignment. The exact placement and design of the undercrossing shall be determined by the Project Biologist, in consultation with MCB Camp Pendleton and the USFWS.

**TE 24** Prior to the initiation of construction in areas within or proximal to known sites occupied by the Pacific pocket mouse, a Pacific Pocket Mouse Resource Management Plan shall be prepared and submitted to the USFWS for review and approval and incorporated into the BRMP. This plan shall identify the strategies available for minimizing impacts and measures to restore impacted suitable habitat.

### Thread-leaved Brodiaea

In the Final SEIR, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts on the thread-leaved brodiaea. These measures are provided in WW 1 through WW 5, WW 10, and WV 27 through 29. In addition, in Section 4.12 of the Final SEIR, *Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species,* Measures TE 3, 7, 2 5, 27, 28, and 29 have been developed to avoid and minimize impacts to brodiaea.

**TE 3** A Biological Resources Management Plan (BRMP) shall be prepared prior to construction. The BRMP shall provide specific design and implementation features of the biological resources mitigation measures outlined in the resource agency approval documents. Issues to be discussed in the BRMP shall include, but are not limited to, resource avoidance, minimization, and restoration guidelines, performance standards, and monitoring requirements. The Draft BRMP shall be submitted to the USFWS, NMFS, CDFG, USACOE, RWQCB, FHWA, and Caltrans for review and approval.

The primary goal of the BRMP will be to ensure the long term perpetuation of the existing diversity of habitats in the project area and adjacent urban interface zones and prevent offsite or indirect effects. The BRMP shall contain at a minimum specific construction monitoring programs for thread-leaved brodiaea, arroyo toad, coastal California gnatcatcher, least Bell's vireo, and Pacific pocket mouse.

**TE 7**

a) Prior to construction (i.e., clearing, grubbing or grading), focused surveys for the thread-leaved brodiaea shall be conducted during the flowering period for this species (approximately May through July). The locations of plants identified within the disturbance limits shall be recorded with a Global Positioning System (GPS) unit with sub-meter accuracy. The soils containing thread-leaved brodiaea shall be tested to determine soil texture, and organic matter, and transported to a native plant nursery for germination and propagation.

b) Prior to construction, soil containing thread-leaved brodiaea corms shall be collected from the specific locations where thread-leaved brodiaea plants were observed the prior spring by personnel experienced in the salvage of corms. Areas of soil 0.6 m by one m by 0.6 m (two ft by three ft by two ft) deep or one m by 1.3 m by 0.6 m (three ft by four ft by two ft) deep shall be collected and transported for placement in an appropriate translocation site selected by the Project Biologist. The translocation site shall be located in a conservation area within an open space dedication area within the region and shall have similar soils, aspect, slope, and hydrology to the donor site (i.e., the site where thread-leaved brodiaea will be collected).

c) Relocation success will be monitored for five years. The number of relocated plants that will emerge in any one year is variable and will depend on seasonal rainfall. Relocation will be considered successful when 10 percent of the relocated population emerges and sets viable seed in any monitoring year. The success criteria may vary as determined by the Project Biologist in consultation with botanists and USFWS staff with recent experience in brodiaea transplantation methodologies in the region.

### 2.8.5 CONCLUSION

The proposed project will involve removal of vegetative resources which are known to provide or may have the potential to provide suitable habitat for state and federally listed Threatened and Endangered wildlife and plant species. The proposed project includes conservation and avoidance measures to minimize the direct and indirect impacts to the greatest extent practicable.

Table 2.8-B provides a summary of the project impacts to and mitigation measures for state and federally-listed Threatened and Endangered wildlife and plant species within the Coastal Zone portion of the proposed project.

## Table 2.8-B: Summary of Project Impacts to Threatened and Endangered Wildlife/Plant Species

| Common Name and Scientific Name | Summary of Direct Impacts | Habitat Impacted | Mitigation Measures |
|---|---|---|---|
| San Diego fairy shrimp<br>*Branchinecta sandiegonensis* | Avoided/No direct impacts to habitat known to support or suitable to support this species. | None | None Required |
| Riverside fairy shrimp<br>*Streptocephalis woottoni* | Avoided/No direct impacts to habitat known to support or suitable to this species. | None | None Required |
| southern steelhead<br>*Oncorhynchus mykiss* | Likely historically present in lower reaches of the creek. Suitable habitat occurs within the upper reaches of this drainage. However, loss of riparian habitat, increased channel width, lack of surficial flows due to extensive groundwater extraction, development, and sediment deposition at key access points and spawning areas would likely limits use of this drainage by this species. | 7.60 ac (3.08 ha) San Mateo Creek (ACOE OHWM)<br><br>Get Numbers from GLA | Identification/Responsibilities of the Project Biologist (WW 1)<br>Project Biologist Review of Project Design (WW 2)<br>Preparation and Implementation of a Biological Resources Management Plan (BRMP) (WW 3)<br>Identification and Implementation of Environmentally Sensitive Areas (ESAs) (WW 4)<br>Installation of Protective Fencing and Other Protective Measures (WW 5)<br>Biological Monitoring/Documentation (WW 5)<br>Restoration of River/Stream Hydrology (WW 6)<br>Preconstruction Educational Meetings (WV 6)<br>Construction Storage (WW 7)<br>Construction Disposal (WW 8)<br>Implementation of Water Quality Protection Measures (WW 9)<br>Construction Staging Areas (WW 10)<br>Design and Installation of Wildlife Movement Corridor Bridges and Culverts (WV 15)<br>Installation of Fish Navigable Creek Crossings (WV 21)<br>Invasive Plant Species Minimization (WV 27, 28, and 29)<br>Installation of Fish Passable Culverts (TE 9) |
| tidewater goby<br>*Eucyclogobius newberryi* | Potential for species to occur within project construction footprint within San Mateo Creek. However, implementation of construction minimization measures will maintain creek flows during construction. Potential for species to occur within project construction footprint within San | 7.60 ac (3.08 ha) San Mateo Creek (ACOE OHWM)<br><br>0.92 ac (0.37 ha) San Onofre (ACOE | Identification/Responsibilities of the Project Biologist (WW 1)<br>Project Biologist Review of Project Design (WW 2)<br>Preparation and Implementation of a Biological Resources Management Plan (BRMP) (WW 3) |

| Common Name and Scientific Name | Summary of Direct Impacts | Habitat Impacted | Mitigation Measures |
|---|---|---|---|
| | Onofre Creek. However, implementation of construction minimization measures will maintain creek flows during construction. | OHWM) | Identification and Implementation of Environmentally Sensitive Areas (ESAs) (WW 4)<br>Installation of Protective Fencing and Other Protective Measures (WW 5)<br>Biological Monitoring/Documentation (WW 5)<br>Restoration of River/Stream Hydrology (WW 6)<br>Preconstruction Educational Meetings (WV 6)<br>Construction Storage (WW 7)<br>Construction Disposal (WW 8)<br>Implementation of Water Quality Protection Measures (WW 9)<br>Construction Staging Areas (WW 10)<br>Design and Installation of Wildlife Movement Corridor Bridges and Culverts (WV 15)<br>Installation of Fish Navigable Creek Crossings (WV 21)<br>Invasive Plant Species Minimization (WV 27, 28, and 29)<br>Installation of Fish Passable Culverts (TE 9) |
| Arroyo toad<br>*Bufo californicus* | Potential impacts at San Mateo Creek crossing. | Breeding – 1.4 ac (14.61 ha) San Juan, San Mateo, and San Onofre Creeks (ACOE OHWM) | Identification/Responsibilities of the Project Biologist (WW 1)<br>Project Biologist Review of Project Design (WW 2)<br>Preparation and Implementation of a Biological Resources Management Plan (BRMP) (WW 3)<br>Identification and Implementation of Environmentally Sensitive Areas (ESAs) (WW 4)<br>Installation of Protective Fencing and Other Protective Measures (WW 5)<br>Biological Monitoring/Documentation (WW 5)<br>Restoration of River/Stream Hydrology (WW 6)<br>Preconstruction Educational Meetings (WV 6)<br>Construction Storage (WW 7)<br>Construction Disposal (WW 8) |

| Common Name and Scientific Name | Summary of Direct Impacts | Habitat Impacted | Mitigation Measures |
|---|---|---|---|
| | | | Implementation of Water Quality Protection Measures (WW 9)<br>Construction Staging Areas (WW 10)<br>Design and Installation of Wildlife Movement Corridor Bridges and Culverts (WV 15)<br>Invasive Plant Species Minimization (WV 27, 28, and 29)<br>Arroyo Toad Specific Measures (TE 10-17) |
| southwestern willow flycatcher<br>*Empidonax traillii extimus* | No location known to support this species will be impacted | 4.78 acres of riparian habitat will be impacted with the Coastal Zone | None Required |
| California gnatcatcher<br>*Polioptila californica californica* | 15 or 17 locations known to support this species will be impacted. | 54.91 acres of coastal sage scrub will be impacted with the Coastal Zone | Identification/Responsibilities of the Project Biologist (WW 1)<br>Project Biologist Review of Project Design (WW 2)<br>Preparation and Implementation of a Biological Resources Management Plan (BRMP) (WW 3)<br>Identification and Implementation of Environmentally Sensitive Areas (ESAs) (WW 4)<br>Installation of Protective Fencing and Other Protective Measures (WW 5)<br>Biological Monitoring/Documentation (WW 5)<br>Construction Staging Areas (WW 10)<br>Invasive Plant Species Minimization (WV 27, 28, and 29)<br>Gnatcatcher Specific Measures (TE 18-19 and 25) |
| least Bell's vireo<br>*Vireo bellii pusillus* | No locations known to support this species will be impacted. | 4.78 acres of riparian habitat will be impacted with the Coastal Zone | Identification/Responsibilities of the Project Biologist (WW 1)<br>Project Biologist Review of Project Design (WW 2)<br>Preparation and Implementation of a Biological Resources Management Plan (BRMP) (WW 3)<br>Identification and Implementation of Environmentally Sensitive Areas (ESAs) (WW 4)<br>Installation of Protective Fencing and Other Protective Measures (WW 5)<br>Biological Monitoring/Documentation (WW 5)<br>Construction Staging Areas (WW 10) |

| Common Name and Scientific Name | Summary of Direct Impacts | Habitat Impacted | Mitigation Measures |
|---|---|---|---|
| | | | Invasive Plant Species Minimization (WV 27, 28, and 29)<br><br>Vireo Specific Measures (TE 20-22 and 28) |
| Pacific pocket mouse<br>*Perognathus longimembris pacificus* | Avoided/No direct impacts to habitat known to support this species. | Not Applicable | Identification/Responsibilities of the Project Biologist (WW 1)<br>Project Biologist Review of Project Design (WW 2)<br>Preparation and Implementation of a Biological Resources Management Plan (BRMP) (WW 3)<br>Identification and Implementation of Environmentally Sensitive Areas (ESAs) (WW 4)<br>Installation of Protective Fencing and Other Protective Measures (WW 5)<br>Biological Monitoring/Documentation (WW 5)<br>Construction Staging Areas (WW 10)<br>Invasive Plant Species Minimization (WV 27, 28, and 29)<br>PPM Specific Measures (TE 23 and 24) |
| thread-leaved brodiaea<br>*Brodiaea filifolia* | Avoided/No direct impacts to habitat known to support this species | Not Applicable | Identification/Responsibilities of the Project Biologist (WW 1)<br>Project Biologist Review of Project Design (WW 2)<br>Preparation and Implementation of a Biological Resources Management Plan (BRMP) (WW 3)<br>Identification and Implementation of Environmentally Sensitive Areas (ESAs) (WW 4)<br>Installation of Protective Fencing and Other Protective Measures (WW 5)<br>Biological Monitoring/Documentation (WW 5)<br>Construction Staging Areas (WW 10)<br>Invasive Plant Species Minimization (WV 27, 28, and 29)<br>Brodiaea Specific Measures (TE 3 and 7) |

# 2.9 WILD AND SCENIC RIVERS

## 2.9.1 INTRODUCTION

The Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.) requires that certain selected rivers of the nation, with their immediate environments that possess remarkable scenic, recreational, geological, fish and wildlife, historic, cultural or other similar values, be preserved in free-flowing condition and that they and their immediate environments be protected. The Wild and Scenic Rivers Act and the National Inventory of Wild and Scenic Rivers (see designated WSR, California, at www.nps.gov/ rivers; accessed 2002) were reviewed to determine whether any designated Wild and Scenic Rivers are located in the SOCTIIP study area. Wild and Scenic Rivers are addressed in Section 4.13 of the Final SEIR.

## 2.9.2 SETTING

### Study Area Setting

The SOCTIIP study area does not contain wild, scenic, or recreational rivers as addressed in the Wild and Scenic Rivers Act or listed in the National Inventory of Wild and Scenic Rivers.

### Coastal Zone Setting

The SOCTIIP study area—including the area within the coastal zone—does not contain wild, scenic, or recreational rivers.

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements being required by the Marine Corps. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.9.3 IMPACTS

### Project Impacts

The SOCTIIP study area does not contain wild, scenic, or recreational rivers as addressed in the Wild and Scenic Rivers Act or listed in the National Inventory of Wild and Scenic Rivers. Therefore, the construction and operation of any of the SOCTIIP build Alternatives (including the A7C-FEC-M/Preferred Alternative) will not result in adverse impacts on wild and scenic rivers. Similarly, the No Action Alternatives will not result in adverse impacts on wild and scenic rivers.

### Impacts in Coastal Zone

The SOCTIIP study area—including the area within the coastal zone—does not contain wild, scenic, or recreational rivers. Therefore, project implementation will not result in a significant impact to any wild, scenic, or recreational rivers.

## 2.9.4 MITIGATION

No mitigation measures related to wild and scenic rivers are needed because there are no wild or scenic rivers in the SOCTIIP study area.

## 2.9.5 CONCLUSION

The SOCTIIP study area—including the area within the coastal zone—does not contain wild, scenic, or recreational rivers. The proposed project will not result in a significant impact to wild, scenic, or recreational rivers in the SOCTIIP study area.

# 2.10 COASTAL BARRIERS

## 2.10.1 INTRODUCTION

Coastal barriers are unique land forms that provide protection for diverse aquatic habitats and serve as the mainland's first line of defense against the impacts of severe coastal storms and erosion. Physical factors responsible for shaping these land forms include tidal range, wave energy, sediment supply from rivers and older, pre-existing coastal sand bodies, and changes in the local sea level. Coastal barriers are addressed in Section 4.14 of the Final SEIR.

## 2.10.2 SETTING

### Study Area Setting

The Coastal Barrier Resource Act (CBRA) was enacted by Congress on October 15, 1982 (P.L. 97-348, 96 Stat 1653). CBRA was passed in an effort "...to minimize the loss of human life, the wasteful expenditure of Federal revenues, and damage to fish, wildlife and other natural and other resources associated with the coastal barriers along the Atlantic and Gulf coasts." (16 U.S.C. Section 3501 (b)). The Coastal Barrier Improvement Act of 1990 (CBIA, P.L. 101-591; 104 Stat. 2931) added areas along the Great Lakes, Puerto Rico, the Florida Keys, the Virgin Islands, and secondary barriers within large embayments to the system protected by the CBRA.

There are no coastal barriers in the SOCTIIP study area; the CBRA and CBIA do not list any Pacific coastal barrier systems under their protection.

### Coastal Zone Setting

There are no coastal barriers in the SOCTIIP study area. The CBRA and CBIA do not list any Pacific coastal barrier systems under their protection.

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements being required by the Marine Corps. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.10.3 IMPACTS

### Project Impacts

The SOCTIIP study area does not contain coastal barriers as addressed in the CBRA or CBIA. Therefore, construction and operation of the proposed project will not result in adverse impacts to coastal barriers.

### Impacts in Coastal Zone

The SOCTIIP study area does not contain coastal barriers as addressed in the CBRA or CBIA. Therefore, the construction and operation of the proposed project will not result in adverse impacts to coastal barriers.

## 2.10.4 MITIGATION

No mitigation measures related to coastal barriers are needed because there are no coastal barriers in the SOCTIIP study area.

## 2.10.5 CONCLUSION

The SOCTIIP study area does not contain coastal barriers as addressed in the CBRA or CBIA. Therefore, the construction and operation of the proposed project will not result in adverse impacts to coastal barriers.

# 2.11 HISTORIC AND ARCHAEOLOGICAL RESOURCES

## 2.11.1 INTRODUCTION

Cultural resources are addressed in Section 4.16 of the Final SEIR. Since the proposed project is also a federal undertaking, compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) and 36 Code of Federal Regulations (CFR) Part 800, regulations implementing Section 106 is required. Subject to and in support of Section 106, LSA performed archival research and a systematic pedestrian surface survey.

### Project Description

Implementation of the Preferred Alternative involves construction of transportation improvements in the south Orange County and North San Diego County area. The MCB Camp Pendleton segment of the project specifically is concerned with the southern extension of the existing State Route 241 (SR-241). At the time of the survey, all the proposed SOCTIIP Alternatives within San Diego County, the Far East Corridor-W (FEC-W), the Far East Corridor-Modified (FEC-M), the Alignment 7 Corridor-Far East Crossover (A7 FEC), and the A7C-FEC-Modified (A7C-FEC-M)/Preferred followed a common alignment. All these alignments are located on the hills on the west side of the San Mateo/Cristianitos Creek channel and roughly parallels the Orange County and San Diego County line. The Preferred Alternative follows approximately the same route as the three previous alternatives with minor modifications. The Area of Direct Impact (ADI), or area within the disturbance limits (DL) for this segment is almost entirely within San Diego County. A very small portion of the ADI extends into Orange County northeast of San Clemente. The southern terminus of the San Diego segment is Interstate 5 (I-5), and the northern terminus is located approximately 4.5 miles to the north, where the Orange County/San Diego County line begins to run west to east.

The initial phase of the project proposes two lanes in each direction. Based on the underlying topography, the width of the area impacted by the footprint of the road will vary between approximately 600 feet (ft) to just over 1,000 ft. In addition, improvements will be made to the I-5 interchange that includes widening the freeway to construct connector roads. The I-5 improvements will occur in the area from 0.6 to 1.4 miles (mi) south of Basilone Road.

The Coastal Zone project study area consists of approximately 139 acres and is located within portions of Sections 10, 11, 13, 14, 15, 23, and 24 in Township 9 South, Range 7 West. The project area is depicted on the United States Geological Survey (USGS) *San Clemente, California* 7.5-minute topographic quadrangle map (Figure 2.11-1).

LSA

FIGURE 2.11-1

Coastal Zone Boundary

County Boundary

San Onofre State Park leasehold subunits

Preferred Alternative (11/26/06) - 138.75 ac within the Coastal Zone

Previous Alternative (11/9/05)

SOURCE: EagleAerial (4/2006); CDMG (11/29/06); CCC (2005)

I:\TCA430\GIS\CZ_Preferred-Alternative.mxd (2/12/07)

*Foothill Transportation Corridor – South*

Preferred Alternative within the Coastal Zone

## 2.11.2 SETTING

### Ethnohistory

The proposed SOCTIIP lies on the border of Gabrielino, Juaneño, and Luiseño territories. The ethnohistoric group identified in northern San Diego County is the Luiseño. The Juaneño are considered to be a linguistically related sub-group of the Luiseño and occupy the area near San Juan Capistrano. Recently, ethnohistoric research has been conducted by Johnson et al. (1998), establishing cultural affiliation of current federally recognized Luiseño tribes with political groups once residing within land now on MCB Camp Pendleton. Although Gabrielino territory is just outside the SOCTIIP project area, it is within the Gabrielino region of influence.

What is known about the Gabrielino, Juaneño, and Luiseño was recorded principally during the initial European land expeditions through the Southern California area. The reason for this is that the swift decline in native populations made it difficult even for early European explorers and inhabitants to observe endemic southern California peoples in a natural state. This decline in native population was brought about by the inability of Native Americans to resist European diseases introduced through initial contact and the establishment of the mission system. The current section describes previously published accounts of Gabrielino, Juaneño, and Luiseño territory.

Territorial descriptions of the various native tribes inhabiting the vicinity of the project area vary somewhat. The Gabrielino occupied the coastal areas of what is now Los Angeles and Orange Counties from Topanga Creek on the north to Aliso Creek in the San Joaquin Hills on the south (Kroeber 1976:620–621; Johnston 1962; Bean and Smith 1978:538; McCawley 1996:3).

Both Sparkman (1908:188–189) and Bean and Shipek (1978:550–551) state that the Luiseño occupied the area from a point just north of San Juan Capistrano southward to the mouth of Agua Hedionda in what is now Carlsbad. Sparkman (1908:189) states that due to language differences, the group near San Juan Capistrano was not considered Luiseño by some. The subsuming of Juaneño by Luiseño is further illustrated by the inclusion of a discussion of Juaneño within a chapter on Luiseño (Bean and Shipek 1978). Rather than give an exact description of Luiseño territory, Kroeber (1976:648–649) states that the northern and northwestern neighbors of the Luiseño are the Gabrielino and Juaneño. Bean and Shipek (1978:551) depict Luiseño territory as centered on the San Luis Rey and Santa Margarita Rivers.

Kroeber (1976:636) states that the Juaneño were wedged in between the Gabrielino and Luiseño, and that Juaneño territory ran from Aliso Creek on the north to a point between San Onofre and Las Pulgas on the coast. Rather than having a distinct language, Juaneño speech was said to be a dialect of Luiseño (Kroeber 1976:636). White (1963:104) states that the dialectical differences between the Juaneño and Luiseño "did not prevent mutual misunderstanding . . . ." White (1963:104) continues that although local variations in culture between Juaneño and Luiseño may have existed, it was of a village level rather than that of tribes, suggesting only minor differences between the two groups. Sparkman (1908) and White (1963) thus argue that the Juaneño are really a sub-group of the greater Luiseño tribe. O'Neil (1988:107, 111) also makes reference to the Juaneño being a coastal branch of the Luiseño. Merriam (1968) extends Juaneño territory northward to the Santa Ana River and Newport Bay, although this is quite a distance north when compared with previous territory descriptions. These previous descriptions suggest major similarities between the Luiseño and Juaneño, perhaps as an initial

stage of cultural evolution in the formation of a new language and tribal group. In any event, major similarities existed between the Luiseño and Juaneño groups, more so than the differences in language and custom between the Luiseño and Gabrielino.

The name "Gabrielino" describes those native groups living in what is now the Los Angeles and Orange County areas and was given due to the affiliation of these groups with Mission San Gabriel Archangel. Linguistically, the Gabrielino, as well as the Luiseño and Juaneño, is a Cupan language in the Takic family, which is part of the Uto-Aztecan (formerly Shoshonean) linguistic stock that once extended across the Great Basin region of Utah, Nevada, and California (Bean and Shipek 1978:550; Bean and Smith 1978:538; McCawley 1996:2–3). In California, the northernmost members of this stock are the Mono, while the Chemehuevi are the easternmost, the Cahuilla are the southernmost, and the Luiseño are the southwesternmost California members (Kroeber 1976). These languages have elsewhere been referred to as Southern California Shoshonean.

The name Luiseño has been applied to those native people living within the "ecclesiastical jurisdiction of Mission San Luis Rey...[who shared] an ancestral relationship which is evident in their cosmogony, and oral tradition, common language, and reciprocal relationship in ceremonies" (Oxendine 1983:8). The term Juaneño describes those native people who were missionized into Mission San Juan Capistrano and who inhabited the very northern portion of MCB Camp Pendleton. Much of the existing ethnohistoric information about the Juaneño is derived from accounts about the Luiseño (Kroeber 1976; White 1963).

Near the northwestern end of the San Joaquin Hills, the Gabrielino village of *Genga* is recorded in upper Newport Bay near the confluence of two drainages. The Juaneño village of *Putuidum* was situated along lower Trabuco Creek (O'Neil 1988), and *Ahachmai* is located along the same drainage to the south nearer the coast (Kroeber 1976:Plate 57; O'Neil and Evans 1980:227). At the coast, the village of *Panhe (Pange* or *Panga)* was situated at the mouth of San Mateo Creek, while *Hechmai (Quechinga* or *Kecchenga)* was located at the mouth of San Onofre Creek less than one mile south (Kroeber 1976:Plate 57; O'Neil and Evans 1980:227; Johnson et al. 1998:18). Englehardt (1998 [1921]:50) quotes Father Peyri of Mission San Luis Rey, who states that the valley in which the mission is located was named *Quechinga* by the natives. Also, the village of *Souche (Zeucche),* according to Harrington (1934:61), and Johnson et al. (1998) is located in the vicinity of *Panhe* at the confluence of San Mateo and Cristianitos Creeks. *Panhe* and *Hechmai* are located within the project area. Within Luiseño territory, *Topamai* is a major village located several miles inland along the Santa Margarita River (Kroeber 1976:Figure 57; McCawley 1995; Strudwick et al. 1995), while *Wiawio* is recorded as a village near the coast north of the mouth of the San Luis Rey River (Kroeber 1976:Figure 57). Bancroft (1967 [1884]:563) quotes Juan Pablo Grijalva (who accompanied Father Juan Mariner on his 1795 exploration of San Diego County), who states that there were two *rancherías* near Las Flores: *Chumella* and *Quesinille.* Sparkman (1908:192) and Kroeber (1976:Plate 57) show *Ushmai (Uchme)* near Las Flores. In preparation of a National Register of Historic Places registration form for the Las Flores *estáncia,* Schaefer (1992) observed circa 1815 Mission San Luis Rey records locating a village of *Huisme* at Las Flores. Therefore, there is one ethnohistoric village *(Panhe)* in the project area, and perhaps the remnants of a second *(Hechmai)*. According to O'Neil (1988), ridge landform in between the San Mateo and San Onofre valleys is the Juaneño geographical feature *pameva*.

A list of Luiseño culture elements was prepared by Drucker (1937) based on information provided by informants from the Soboba, Temecula, and Pala. An excellent description of Luiseño social organization, including descriptions of Luiseño environment, economy, religion, and warfare is provided by White (1963). Father Gerónimo Boscana lived with the Juaneño natives at Mission San Juan Capistrano from 1812–1826 and recorded many of their daily and religious activities and beliefs (Boscana 1978; Bright 1978:iii; Harrington 1978).

A list of Gabrielino culture elements was prepared by Harrington (1942) and included in a publication describing material elements from the central California coast. Auspiciously, a brief description of native California customs, beliefs, and activities, including those of the Luiseño, Juaneño, and Gabrielino, was prepared by Kroeber (1908), most likely from notes from studies that were later used to prepare his seminal work on California Indians (Kroeber 1976). Informants from Kroeber's earlier work (1908) are Fernandeño (Gabrielino living near Mission San Fernando) and Gabrielino.

Oxendine (1983) researched Late Period Luiseño villages and describes them as archaeological sites containing midden, bedrock milling features, prehistoric ceramic sherds, and usually pictographs and Cottonwood style projectile points. Preferred habitation locations are described as along valley edges, at interfaces of two or more plant communities, and in locations specifically containing a spring, a creek, sandy loam sediments, slopes of about nine percent, and bedrock with horizontal or slightly sloping faces. It is also suggested (Oxendine 1983:70) that preferred Luiseño village sites included elevated landforms such as knolls and ridges.

The Gabrielino, Luiseño, and Juaneño were hunters and gatherers who used both inland and coastal food resources. They hunted and collected seasonally available food resources and led a semi-sedentary lifestyle, often living in permanent communities along watercourses and near coastal estuaries. Commonly chosen habitation sites included rivers, streams, sheltered coastal bays and estuaries, and the transition zone marking the interface between prairies and foothills (McCawley 1996). The presence of water, a stable food supply, and some measure of protection from flooding were the most important factors relating to the location of habitation sites. Gabrielino and Luiseño communities located in the interior regions maintained permanent geographical territories or use-areas that averaged 30 square miles, although it is likely that coastal settlements occupied less acreage where food resources may have been more plentiful and more easily available throughout the entire year (White 1963:117, 119; Oxendine 1983:44).

In addition to permanent settlements, native groups occupied temporary campsites used seasonally for hunting, fishing, and gathering plant foods and shellfish (White 1963:120–124; McCawley 1996:25). Rabbit and deer were the most commonly hunted animals, while acorns, buckwheat, chía, berries, and fruits were some of the more commonly collected plant foods. Acorns were the staple food of most indigenous Californians (Kroeber 1976:84) and were the most characteristic feature of the domestic economy of native California (Gifford 1936:87). Fully 25–50 percent of inland Luiseño food is thought to have been acorns (White 1963:116, 121). Among the inland Luiseño, land use was patterned with only a small quantity of total territory in disuse (White 1963:122). The Gabrielino established seasonal camps along the coast and near estuaries and bays such as Newport Bay in order to fish, gather shellfish, and hunt waterfowl (White 1963:122; Hudson 1971). The economy of coastal groups is thought to have focused on marine rather than land resources (White 1963:119).

Gabrielino villages generally contained populations of 50–100 inhabitants, although larger communities may have existed. Luiseño and Juaneño villages are thought to have numbered approximately 200 individuals, while as many as 250 individuals may have inhabited some large Luiseño villages (White 1963:104, 117–119).

Boscana (1978:65) describes the permanence of Juaneño villages in the following passage: ". . . in the winter they resided in one place, and in summer another. This was general among them, excepting in the case of those tribes located on the sea-coast who seldom moved because their maintenance was derived from the sea." This suggests that inland villages were seasonal, while coastal villages may have been occupied permanently, since their food source was more dependable.

Village communities were the focus of family life. Gabrielino communities each included one or more patrilineal extended families or lineal kinship groups, known as clans (Kroeber 1976; Johnston 1962; Bean and Smith 1978; McCawley 1996). Both Gabrielino and Luiseño clans and villages were apparently exogamous, marrying individuals from outside the clan or village (Reid 1852; White 1963:165). Luiseño groups were patrilocal and patrilineal, with kinship and habitation following the male lineage (White 1963:125). As for ownership and organizational principles, the Luiseño practiced both levirate and sororal polygyny, indicating that family groups consisting of sisters who were married to the same man, or to brothers, could use the same family-owned food preparation implements without friction arising from ownership values. It also shows that villages were clusters of closely related families (White 1963:125).

Gabrielino villages were united under the leadership of a *tomyaar*, or chief, who inherited his position from his father. Juaneño chieftainship is also known to have been hereditary in the male line (Kroeber 1976:645) and is thus assumed to be the same for the Luiseño, since both groups are known to have been related. Each Gabrielino lineage comprised several related nuclear families; membership in a lineage was traced through the father and allowed an individual to claim use rights over the territory owned by that group. The *tomyaar* was the leader of the religious and secular life of the community and served as chief administrator, fiscal officer, war leader, legal arbitrator, and religious leader (Bean and Smith 1978; Harrington 1942:32). The *tomyaar* was aided in his duties by a Council of Elders, which consisted of the leaders of the lineages residing in the community, as well as other wealthy and influential individuals. Council positions were hereditary and descended from father to son.

Shamans also played an important role in Gabrielino society, serving as the principal doctors, therapists, philosophers, and intellectuals; often, the tomyaar himself was an important and influential shaman (Bean and King 1974:25–26). The Juaneño word for shaman is *pul*, which appears to be the singular of *puplem*, "the initiated" (Kroeber 1976:643). The lack of differentiation between the shaman and those who were fully instructed in sacred tribal lore insinuates that shamans were revered figures. Luiseño shamans were known to have used stone pipes, despite the fact that the common smoking pipe was ceramic (Kroeber 1976:653). This suggests that when found on Late Prehistoric period sites, stone pipes may have religious significance.

Native culture in coastal southern California was characterized by an active and elaborate system of rituals and ceremonies. Rituals included individual rites of passage, village rites, seasonal ceremonies, and participation in the widespread *Chinigchinich* cult (variant spellings Kroeber 1976; McCawley 1996). The cult of the culture hero *Chinigchinich* was observed and recorded by Franciscan missionary Father Gerónimo Boscana during his residences at Missions San Luis Rey (1811–1814) and San Juan

Capistrano (1814–1826) and describes the rich and complex cosmology and rituals practiced at the time (Boscana 1978; Harrington 1934).

At the time of European contact, the material wealth and cultural sophistication of the Gabrielino people was exceeded only by their northwestern neighbors, the Chumash. This led Bean and Smith (1978:538) to comment: "With the possible exception of the Chumash, the Gabrielino were the wealthiest, most populous, and most powerful ethnic nationality in southern California, their influence spreading as far north as the San Joaquin Valley Yokuts, as far east as the Colorado River, and south into Baja California."

Recent ethnohistoric research has also been conducted for the MCB Camp Pendleton area. Two recent ethnohistoric reports have documented Native American marriages and village names for the MCB Camp Pendleton area. The first report (McCawley 1995) concentrates on *Topamai*, the Native American village associated with the Santa Margarita Ranch House, an adobe structure thought to have been originally constructed sometime between 1840–1865, when Juan Forster owned *Rancho Santa Margarita* (McCawley 1995:58–65; also see Strudwick 1996:7). McCawley identifies marriage ties linking *Topamai* with 25 other Luiseño settlements. He recommends that data from the San Luis Rey padrones and San Juan Capistrano mission registers could be compiled to determine the size and age/sex composition of *Topamai*, as well as to identify those native lineages residing at *Topamai* and marrying into the community (McCawley 1995:81). McCawley (1995:81) also recommended a review of J. P. Harrington's recently archived microfilm photographs in an effort to identify definitive locations for a number of Luiseño place names.

A second ethnohistoric report (Johnson et al. 1998), based on San Juan Capistrano and San Luis Rey mission records, was used to establish cultural affiliation of current federally recognized Luiseño tribes with political groups once residing within land now on MCB Camp Pendleton. The report demonstrated that patrilineal clans appear to have been village-specific, although larger communities (such as *Topamai*) were shown to contain a number of clans (Johnson et al. 1998:49). This report compiled information from census registers or padrones in an effort to recreate information from missing Mission San Luis Rey baptismal, marriage, and burial registers. It also began compiling the same information from Mission San Juan Capistrano registers. Information about Native Americans from both missions, now on a computer database, can be used for a number of purposes, including tracing ancestry. In conjunction with archaeological data, it may eventually be possible to identify likely village sites by using this information derived from mission registers and padrónes (censuses).

## Archival Research/Previous Archaeological Studies

Previous archaeological surveys that have occurred for the Preferred Alternative and Coastal Zone are summarized below and in Table 2.11-A. Table 2.11-B summarizes the excavations that have occurred and the National Register recommendations made for the sites based on excavation results.

### Table 2.11-A: Previous Survey Projects within Project Area in Coastal Zone

| Survey | Sites Discovered/Relocated |
|---|---|
| Welch (1975a) | CA-ORA-22 and CA-SDI-4,282 |
| Welch (1978) | CA-SDI-4,412 |

### Table 2.11-B: Excavation Projects within Project Area in Coastal Zone

| Site | Study | Effort | National Register Status |
|---|---|---|---|
| CA-SDI-1,074 | Byrd et al. (1995)<br>Singer et al. (1993)<br>Chace (1975) | 38 STPs, 6 units<br>3 STPs, 2 units<br>42 units | Recommended Eligible |
| CA-SDI-4,412[1] | Welch (1978) | Unknown number of STPs | Undetermined |
| CA-SDI-13,324 | Strudwick et al. (1994)<br><br>Giacomini (1996) | Surface collection, 26 STPs, 3 units<br><br>Backhoe trenches, 7 units | Eligible |
| CA-SDI-13,325 | Reddy et al. (1996)<br>Byrd et al. (1995) | Surface collection, 4 trenches, 7 units, 48 STPs | Eligible |

Table data derived in part from Byrd (1998).

Welch (1975a) performed a 149-acre survey with a crew of seven. No specifics regarding visibility or methodology were presented. Two sites, CA-ORA-22 and CA-SDI-4,282, were rediscovered and site records updated. MCB Camp Pendleton has evaluated the survey adequacy as indeterminate (Byrd 1998:47). Part of Welch (1978) included an approximate 28-acre survey and testing program on the south side of the I-5 freeway at Basilone Road. Site CA-SDI-4,412 was relocated and an unknown number of shovel test pits were excavated in a random radial pattern across the area. Both artifacts and midden soil were observed in road cuts and the postholes. MCB Camp Pendleton has evaluated the report as inadequate based on the insufficient subsurface exposure, lack of maps, data, and information regarding the testing results (Byrd 1998: 57).

### Previously Recorded Sites within the Project Area in Coastal Zone

In addition to the six sites that are part of the SMAD, there are five additional previously documented archaeological sites plotted either within or adjacent to the project ADI and buffer area. Of these, four resources are in the ADI and one is in the 300 ft buffer area surrounding the ADI. Table 2.11-C summarizes sites and their relation to the project ADI and the 300 ft buffer area. The individual resources are described in more detail below.

### Table 2.11-C: Existing Sites within the Project Area in Coastal Zone

| Resource | Description | Location | National Register Status |
|---|---|---|---|
| CA-SDI-1,074 | Village site | In ADI | Recommended Eligible |
| CA-SDI-1,075 | Village site | In ADI | Undetermined |
| CA-SDI-4,412 | Midden | In Buffer | Undetermined |
| CA-SDI-13,324 | Village site | In ADI | Eligible |
| CA-SDI-13,325 | Village site | In ADI | Eligible |

[1] Possibly associated with CA-SDI-1,075.

| Resource | Description | Location | National Register Status |
|---|---|---|---|
| CA-ORA-22/ CA-SDI-13,071 | SMAD | In ADI | Eligible |
| CA-SDI-4,282 | SMAD | In ADI | Eligible |
| CA-SDI-4,535 | SMAD | In ADI | Eligible |
| CA-SDI-8,435* | SMAD | In ADI | Eligible |
| CA-SDI-11,703 | SMAD | Buffer | Eligible |
| CA-SDI-11,929 | SMAD | In ADI | Eligible |

* Just outside the Coastal Zone; included as it is part of the District.

**CA-SDI-1,074** was first recorded by Malcolm Rogers as site W-294 sometime between 1939 and 1945. It was first officially recorded as CA-SDI-1,074 by James (1964a). It is described as a surface scatter of marine invertebrates, artifacts, and fire-affected rock, varying in density from very low to high (O'Neill, 1994). The site is plotted as spanning the ADI and buffer area. CA-ORA-1,074 is in the physiographic location of Kroeber's (1976) ethnohistoric village of *Hechmai*. James (1964a) described the site as a relatively narrow shell midden measuring 300 ft (91 meters [m]) across and 14 inches (35 centimeters [cm]) deep. A highway salvage excavation in 1965 by Dewey S. Buck was conducted that consisted of 42 2 x 2 m units excavated in 20 cm levels through one-fourth-inch mesh (Chace 1975). Chace (1975) reports that an extensive assemblage of artifacts was collected during the salvage, including 34 ceramic sherds from 3 pottery vessels, 3 sherds from red or orange slipped ware, 1 piece of glazed ware, 1 ceramic bead, 240 general hand tools composed of basalt beach cobbles, 81 small projectile points, 3 manos, 15 mortars, 135 shell beads (mostly discs), 57 abalone fish hooks, 53 species of shellfish, and numerous fish bones. The site was updated by Ogden in 1992 (Pignolio et al. 1992) when fire-affected rock and 200 pieces of marine shell were noted in a 500 m north/south by 150m east/west area. The site was further tested by Singer et al. (1993) and Byrd et al. (1995). Both of these tests yielded extensive collections of marine shell, fish, and mammal bone, chipped and ground stone artifacts, and worked shell and bone artifacts. The most recent site update describes the site as a surface scatter of marine invertebrates, artifacts, and fire-affected rock in a 560 m east/west by 335 m north/south area (O'Neill 1994). The updated site record notes that the central portion of the site has been destroyed by the construction of Pacific Coast Highway and the I-5, and the northern portion has been used as an informal landfill, with piles of discarded construction debris. The highest concentration of surface artifacts was noted as lying on the southern portion of the site, south of I-5, while the northern portion has only a low density of surface artifacts. Byrd et al. (1995) believes that despite extensive construction in the area of the site, the site is eligible for the National Register; however, this recommendation was not submitted to the SHPO for concurrence. It appears to have been largely or completely destroyed by highway and road construction, Southern California Edison facilities, and the MCB Camp Pendleton Percolation Ponds. A single igneous flake was observed on the disturbed shoulder of the frontage road on the south side of I-5. The site was originally plotted as spanning the ADI and buffer area, and there is still the potential for small intact buried deposits to be present.

**CA-SDI-1,075** was first encountered by Allanson and Farmer in 1950 (James et al. 1964b), but was not officially recorded until 1964 by James (1964b). It was described as a "shell midden 'loaded' with stone artifacts," In 1997, a site update found the site to consist of approximately 25 pieces of shell and

one metavolcanic flake. Excavation of three shovel test pits (STPs) recovered no cultural material (Victorino, 1997). The site is plotted as spanning the northern portion of the ADI and buffer area. According O'Neil (1988), CA-SDI-1,075 is the Juaneño geographical feature *Pameva*. Several researchers hypothesize that *Panhe* and *Hechmai* were politically linked twin villages and that they encompass the entire San Mateo and San Onofre Valleys and the bordering ridges next to the Pacific Ocean. a 90 m area in the 50–200 foot contour. An update by Hines and Rivers (1990a) noted 10 flakes, 2 of which were retouched in a 20-meter-wide strip south of the freeway frontage road between the E. Clampus Vitus monument for Forster City and the point where the bicycle trail and frontage road diverge. The update also noted that the area was highly disturbed and the noted flakes could have been redeposited. In 1997, a site update found the site to consist of approximately 25 pieces of shell and one metavolcanic flake in a 500 m north/south by 30 m east/west area (Victorino 1997). Excavation of three STPs and examination of erosion channels recovered no cultural material (Victorino 1997). It appears to have been paved, developed, graded, landscaped, or otherwise disturbed. During the current survey, no cultural material was observed north of I-5, and two possible flakes were observed in a disturbed graded area between the freeway and the frontage road on the south side of I-5. The site was originally plotted as spanning the ADI and buffer area, and there is still the potential for small intact buried deposits to be present.

**CA-SDI-13,324** was originally recorded by Ogden Environmental and Energy Services (Ogden) in 1992 (James et al. 1992a). The site was identified in a road berm and thought to be redeposited from the adjacent field. It was found and discussed by Glenn and Crawford (1994) during a 242-acre survey; they also recorded sites CA-SDI-13,323/H and CA-SDI-13,325. MCB Camp Pendleton has evaluated the survey adequacy as adequate (Byrd 1998:47). Site updates by Strudwick et al. (1994) and Giacomini (1996) based on test excavation results greatly expanded the original site boundary and documented an extensive habitation site. National Register eligibility for the site has been established through consensus consultation with the SHPO on MCB Camp Pendleton Project P-529. The replacement of a power pole is planned within the site.

As originally recorded, CA-SDI-13,324 included a single volcanic flake and marine shell in a 200 m northeast/southwest by 15 m northwest/southeast area on the 30 ft contour (James et al.1992a). Ogden recommended testing to determine National Register status prior to any ground-disturbing activities within the site. In 1993 Gallegos and Associates (Gallegos) conducted a surface survey of the site and excavated 26 STPs and three 1 x 1 m units (Strudwick et al. 1994). Gallegos discovered an extensive cultural deposit extending to depths of 100 cm with two apparent loci. Gallegos recovered 85 artifacts (71 pieces of chipped stone, 4 modified flakes, 3 unidentified groundstone fragments, 2 milling stone fragments, a mano, a biface fragment, a Cottonwood projectile point, a shell bead, and historic debris), more than 5,000 grams (11 pounds) of shellfish remains (dominated by rocky intertidal species such as *Protothaca stamina, Tegula* sp., and *Mytilus* sp.), 65 grams (2.3 ounces) of bone, two fish otoliths, fire-affected rock, and charcoal (Strudwick et al. 1994). Based on the distribution of the collected artifacts, Gallegos increased the size of the site to 400 m north/south by 100 m east/west and also noted that the archaeological remains were concentrated within two loci. Greenwood and Associates (G and A) (2003) apparently did not attempt to relocate this site during their survey of the project area for the SOCTIIP. The project impact is the replacement of an existing wooden power pole with a steel power pole. It was not visited during the recent LSA study (Fulton, McLean, Smith, and Strudwick 2006), as it was not part of the design plan at the time of the survey. However, according to Ivan Strudwick, the

pole is located in a portion of the site containing dense cultural material (personal communication 2005).

**CA-SDI-13,325** was originally recorded by Ogden in 1992 (James et al. 1992b) and later tested by Byrd et al. (1995). It was found and discussed by Glenn and Crawford (1994) during a 242-acre survey; they also recorded sites CA-SDI-13,323/H and CA-SDI-13,324. MCB Camp Pendleton has evaluated the survey adequacy as adequate (Byrd 1998:47). The site is a large shell midden containing two areas of intensive deposit surrounded by a larger low- density scatter of marine shell (Pigniolo, 1994). As the site is plotted, the southwestern portion of the site is within the project ADI and buffer area. National Register eligibility for the site has been established through consensus consultation with the SHPO on MCB Camp Pendleton Project P-529.

As originally recorded, CA-SDI-13,325 was originally recorded by Ogden (James et al. 1992b) as an extensive 500 m by 1,100 m occupation site containing marine shell fragments and lithic artifacts. The site was tested by Byrd et al. (1995) by placing 53 STPs, 7 1 x 1 m units, and 4 backhoe trenches. Based on the testing, Byrd et al. (1995) reduced the site dimensions to 400 m x 300 m. The new site dimensions contained two loci of concentrated artifacts and shell remains with a lighter concentration of artifacts and marine shell in other areas of the mapped site. Loci A, located in the northwest portion of the site, measured 150 x 100 m in size and extended to depths of 90 cm, with the upper 50 cm being disturbed by agricultural activities. Loci B is located in the southeast portion of the site and extended to depths of 50 cm, with all of this being in disturbed sediments by agricultural activities. Byrd et al. (1995) submitted samples of carbon and shell for radiometric dating and determined that this site was occupied as early as 3,000 years before the present. In 1998, during monitoring for geotechnical borings associated with the Foothill-South corridor, G and A observed dark soil and shell fragments *(Protothaca staminea)* in Auger 1 at a depth of between 2.74 and 2.89 m below the surface near the southwest corner of the site (Hale 1998). G and A could not determine whether this was a continuous deposit or a discrete component of occupation; however, they prepared a site record update expanding the boundaries of CA-SDI-13,325 into the area of the find (Hale 1998). CA-SDI-13,325 is partially within the project ADI and buffer area. The current study confirmed the location of the site and found it to be as described. In addition to the large scatter of marine shell, numerous pieces of lithic debitage, cores, and scrapers were noted as well as one complete metate.

**The SMAD** is located in the southwestern portion of the ADI and has been evaluated as eligible for listing in the National Register. The SMAD includes six archaeological sites: CA-ORA-22/CA-SDI-13,071, CA-SDI-4,282, CA-SDI-4,535, CA-SDI-8,435, CA-SDI-11,703, and CA-SDI-11,929. The district has been determined eligible under criteria A (contribution to broad and specific patterns of Juaneño history) and D (potential to address issues regarding the prehistory of coastal southern California). SDI-13,071 (ORA-22) has been tested by Romani (1997), Strudwick and Gallegos (1994), Cook and White (1977), Welch (1975a), and ARI (1973). The site is considered the ethnohistoric Juaneño village of *Panhe*, based on ethnographic data gathered by Kroeber (1976) and Harrington (1934:61) and on the recovery of two glass beads (Romani 1997). Over 100 hundred *Panhe* Juaneño were baptized at San Juan Capistrano before 1800.

Site CA-SDI-4,282 was tested with shovel test pits (STPs) by Welch (1975a). The adequacy of the study is in question. Site CA-SDI-8,435 was tested by Hines and Rivers (1991) and recommended

eligible. Sites CA-SDI- 4,282, CA-SDI-11,703, and CA-SDI-11,929 are included within the SMAD, but have not been individually evaluated based on a preliminary review of the records.

Recommendations have been made to expand the district boundary to include CA-SDI-13,324 and CA-SDI-13,325 given linkage through late Holocene littoral adaptations (Byrd 1998). Reddy et al. (1996) tested the area in between sites CA-SDI-13,324 and CA-SDI-13,325. Strudwick et al. (1994) tested CA-SDI-13,324 and concluded that it is a Late Prehistoric site associated with CA-SDI-13,325. Reddy et al. (1996) and Byrd et al. (1995) evaluated site CA-SDI-13,325. Byrd concluded that the site is a large Late Archaic site and recommended it eligible for listing in the National Register. Nearby within the same landform, site CA-SDI-13,323/H was tested by Strudwick et al. (1994) and was recommended not eligible for the National Register.

All sites except CA-SDI-8,435 are within the Coastal Zone, and all sites except CA-SDI-11,703 are within the ADI of the project.

### Previously Recorded Sites Adjacent to the Project Area in Coastal Zone

Except as mentioned above, for the sites that comprise the SMAD, the only site that is within the Coastal Zone but not within the ADI for the SOCTIIP is site CA-SDI-4,412.

**CA-SDI-4,412** is described as a light shell midden and scattered lithic tools (Welch 1975b). The site is plotted south of the project DL, but is within the 300 ft buffer area. CA-SDI-4,412 was first recorded by Welch (1975b) as a low-density midden containing hammerstones, flakes, retouched flake, a projectile point, a core, and shell fragments in an 85 m east/west by 40 m north/south area. He noted that there were disturbances to the site, including dirt roads, asphalt fragments, and a bulldozer cut. The site was updated by Hines and Rivers (1990b), noting that the site was greatly disturbed by roads, a lifeguard station, water systems, gas pipelines, fences, foot paths, and landscaping. They increased the size of the site to 140 m northwest/southeast by 80 m southwest/northeast and believed that it was possible that the central portion of the site was protected by heavy vegetation. Hines and Rivers (1990b) also noted that there is a historical marker on site noting the location of Forster City, a small farming community that was abandoned in the late 1890s, and all the buildings moved to other locations. CA-SDI-4,412 is located south of the project ADI and is within the 300 ft buffer area. The site was relocated during the current study, which confirmed its location and found it to be as previously described.

### Recently Identified Resources

LSA field crews studied previously unsurveyed portions of the project area, including the DL, between March 17 and 23, 2005 (Fulton, McLean, Smith, and Strudwick 2006). The survey occurred near the end of one of the wettest rainy seasons on record, and the thick, tall vegetation reflected the abundant rainfall that had occurred. Adequate ground visibility was generally limited to areas such as dirt roads and OHV trails, animal trails, and fuel breaks. The area south and east of SMAD has been extensively altered by road and highway construction, Southern California Edison development, utility installations, and military base construction activities. The only relatively undisturbed areas in this portion of the alignment are the former agricultural fields in the vicinity of sites CA-SDI-13,324 and CA-SDI-13,325 and perhaps portions of the coastal bluff on the south side of I-5.

The LSA survey, within the Coastal Zone portion of the DL, documented six new cultural resources. Two of these are prehistoric isolates of one or two items (37-026830 and 37-026831). The remaining four resources are extant historical built environment resources such as roads, power poles, and bridges (37-026824, 37-026825, 37-026826, and 37-027520). Of the 6 newly recorded resources documented during the survey, all are within the project DL. Three resources are in the ADI and three are in the 300 ft buffer area surrounding the ADI. The individual resources are described below. Table 2.11-D summarizes the new finds and their relation to the project ADI and the 300 ft buffer area. As a reminder, the project's DL consists of both the ADI and the 300 ft buffer.

**Table 2.11-D: New Sites and Isolates within the DL of SOCTIIP and also Coastal Zone**

| Resource | Description | Location |
|---|---|---|
| P-37-026824 | 1930 power pole | In Buffer |
| P-37-026825 | Bridge | In Buffer |
| P-37-026826 | Bridge | In Buffer |
| P-37-026830 | Isolated Flake tool | In ADI |
| P-37-026831 | Metate and core | In ADI |
| P-37-027520 | Christianitos Road | In ADI |

**37-026824** is a power pole containing a nail dated 1930. It was recorded by Fulton, Smith, and Roberts (2005a). The pole is an element of an east-west trending powerline that appears to still be in use. It is located within the DL, but is outside the ADI.

**37-026825** is a historic bridge located where Old Coast Highway crosses over San Onofre Creek. It was recorded by Fulton, Smith, and Roberts (2005b). No date was visible on the bridge; however, the nearby bridge at San Mateo Creek (37-026826) has a construction stamp of 1946, so it is likely that this bridge was built at approximately the same time. It is located outside the ADI, but is within the DL (buffer); however, it will not be affected by the project.

**37-026826** is a historic bridge located where the Old Coast Highway crosses over San Mateo Creek. It was recorded by Fulton, Smith, and Roberts (2005c). A stamp on the bridge indicates that it was constructed by NM Ball Sons, Contractors, June 24, 1946. It is located outside the ADI, but is within the DL; however, it will not be affected by the project.

**37-026830** is an isolated core tool of a dark, fine-grained igneous material. It was recorded by Fulton, Smith, and Roberts (2005d). It is located on a bluff overlooking San Onofre Creek.

**37-026831** is a sandstone metate exhibiting minimal use and a dark, fine-grained igneous core. It was recorded by Fulton, Smith, and Roberts (2005e). It is located in a brush-covered area between the I-5 Freeway and a frontage road.

**37-027520** is Cristianitos Road, a 2-lane, 4.3-mile long paved road. It was encountered during the LSA survey of the MCB Camp Pendleton portion of the project (Fulton, McLean, Smith, and Strudwick 2006) and was later recorded by Fulton and Smith (2006). The road was built after 1902 and before

1948 (when it is depicted on the 1948 USGS *San Clemente, California* quadrangle). An approximately 2,500-foot segment of the existing road at the southern end is a modern realignment postdating the 1968 edition *San Clemente, California* quadrangle that was photorevised in 1975. The original road alignment as depicted on the 1948 *San Clemente, California* quadrangle terminated at Avenue Dolores in San Clemente. The southern portion of Cristianitos Road will be impacted by the project and necessitates its realignment. However, this road is not associated with an important event or person; it does not represent distinctive characteristics, high artistic values, or the work of a master; and it does not have potential for important information in history. Therefore, the road is not eligible for listing in the National Register and does not qualify as a "historic property" as defined by Section 106 regulations. Within the Coastal Zone, this property is entirely within the SMAD.

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach. The project refinements are enhancements that support improved security and the military training mission of the Base.

Cultural resources surveys were conducted for the entire area within the modified project footprint.

## 2.11.3 IMPACTS

### Project Impacts

There are 25 identified cultural resource sites within the Preferred Alternative. Significance of cultural resources can be determined by the eligibility of the resource for listing on the National Register of Historic Places (National Register). The National Register presents four criteria for evaluation. These are:

- Criterion A: associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B: associated with the lives of persons significant in our past; or
- Criterion C: embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D: yielded or may be likely to yield, information important in prehistory or history.

Of the 25 resources within the Preferred Alternative, 7 have been recommended ineligible for the National Register under any criteria. Fourteen of the identified cultural resource sites have been recommended eligible for listing on the National Register. Of the sites that are eligible for the National Register, two are eligible under Criterion D only. Ten National Register-eligible sites are

elements of the San Mateo Archaeological District (SMAD) and are considered eligible under Criteria A and D. The SMAD is also considered a Traditional Cultural Property by local Native American Groups. Eight of the identified resources have not been formally evaluated, in consultation with the SHPO, for eligibility. The eight unevaluated resources are located within the RMV Lands, Conservancy Land, adjacent to the Talega Development, and along I-5 in San Diego. Mitigation measures are provided that will minimize or mitigate impacts to these resources to the extent feasible. In addition, avoidance of these resources within the Preferred Alternative Study Area has also been investigated, and avoidance has been achieved for two resources considered the "core" of the SMAD (CA-ORA-22 and CA-SDI-8435). Where possible, ground-disturbing impacts of the Preferred Alternative were placed on deflating landforms, where there is little likelihood of buried components for impacted resources.

### Impacts in the Coastal Zone

There are 11 previously recorded resources within the DL for the Preferred Alternative (CA-ORA-22/CA-SDI-13,071, CA-SDI-1,074, CA-SDI-1,075, CA-SDI-4,412, CA-SDI-4,282, CA-SDI-4,535, CA-SDI-8,435, CA-SDI-11,703, CA-SDI-11,929, CA-SDI-13,324, and CA-SDI-13,325), and in the Coastal Zone on MCB Camp Pendleton. Six of these are part of the National Register SMAD (CA-ORA-22/CA-SDI-13,071, CA-SDI-4,282, CA-SDI-4,535, CA-SDI-8,435, CA-SDI-11,703, and CA-SDI-11,929) and all but two (CA-SDI-4,412 and CA-SDI-11,703) are within the ADI of the project area.

Two ethnohistoric villages are known to have been present within the alignment and buffer area. *Panhe (Pange* or *Panga)* was situated at the mouth of San Mateo Creek, while *Hechmai (Quechinga* or *Kecchenga)* was located at the mouth of San Onofre Creek less than 1 mile south (Kroeber 1976:Plate 57; O'Neil and Evans 1980:227; Johnson et al. 1998:18). CA-SDI-13,071 (CA-ORA-22) is considered the ethnohistoric Juaneño village of *Panhe*, based on ethnographic data gathered by Kroeber (1976) and Harrington (1934:61) and on the recovery of two glass beads (Romani 1997). This site is within SMAD and was not part of the current study. The village of *Hechmai (Quechinga* or *Kecchenga)* was located at the mouth of San Onofre Creek (Kroeber 1976: Plate 57; O'Neil and Evans 1980:227; Johnson et al. 1998:18). The Kroeber (1976: Plate 57) map depicts the location of the village of *Hechmai* on the south side of San Onofre Creek in the area corresponding to site CA-SDI-1,074. The map in the report by Johnson et al. (1998:18) shows the village (labeled *Kecchenga* in this case) on the north side of San Onofre Creek, which would place it in the location of CA-SDI-1,075. In either case, it is documented that the mouths of both San Mateo and San Onofre Creeks were extensively used during the ethnohistoric and prehistoric periods.

According to O'Neil (1988), the ridge separating San Mateo and San Onofre Valleys is the Juaneño geographical feature *Pameva*. Several researchers hypothesize that *Panhe* and *Hechmai* were politically linked twin villages and that they encompass the entire San Mateo and San Onofre Valleys and the bordering ridges next to the Pacific Ocean.

The project area south and east of SMAD is located along marine terraces above the Pacific Ocean and on stream terraces along San Mateo and San Onofre Creeks. The environment of this area is more conducive to the establishment of longer-term habitation sites characterized by shell middens and diverse and extensive artifact assemblages. The archaeological resources in this portion of the project area have been

extensively documented and investigated. The area has also been severely impacted by development, with negative consequences for the cultural resources present.

The previously recorded sites in this portion of the project include CA-SDI-1,074, CA-SDI-1,075, CA-SDI-4,412, CA-SDI-13,324, and CA-SDI-13,325. Sites CA-SDI-1,074 and CA-SDI-1,075 appear to have been completely destroyed within the project area; however, this will need to be confirmed. CA-SDI-4,412 appears to be in essentially the same condition as recorded and is located outside the ADI but within the buffer area. CA-SDI-13,325 is still present in essentially the same condition as it has been previously documented. CA-SDI-13,324 was not revisited during the current study; however, the site is located in former agricultural fields, and it is expected that the condition of the site has not been significantly altered.

Within the project area (SOCTIIP) and in the Coastal Zone, the recent survey by LSA (Fulton, McLean, Smith, and Strudwick 2006) identified 6 new cultural resources; 4 of the resources (37-026824 [power pole], 37-026825 [Coast Highway Bridge], 37-026826 [Coast Highway Bridge], and 37-027520 [Cristianitos Road] are extant historical built environment resources that are unlikely to be affected by the project. The remaining two recently identified resources are prehistoric isolates consisting of one or two artifacts (37-026830 and 37-026831).

The study demonstrates that much of the project area was extensively used by the prehistoric inhabitants of the region. As expected, large, extensive habitation sites are concentrated along the marine and stream terraces. LSA also recognizes that additional resources are likely present within the project area that were not discovered during the current investigation. Due to the dense vegetation in some areas, ground visibility was not adequate to conclude that all sites were necessarily located. In addition, the areas along the stream terraces have the potential to contain significant habitation sites that have subsequently been capped by alluvial deposits.

## 2.11.4 MITIGATION

Mitigation measures were provided in the MMP for TCA EIR No. 3 for the Foothill Transportation Corridor–Oso Parkway to I-5, to minimize the impacts to archaeological and historic resources identified for the alignments analyzed in that EIR. All the mitigation measures in the MMP for TCA EIR No. 3 were reviewed and have been incorporated, as applicable, in the mitigation measures for the Preferred Alternative. The mitigation measures for cultural resources are listed below and in the Mitigation Monitoring and Reporting Program in Appendix A of this document.

The mitigation measures reflect the progression of the phased application of the criteria to a project-level analysis for the Preferred Alternative. As the phased approach allows, additional archaeological resources were identified as a result of the additional surveys that were completed and information that was made available. All efforts are being made to avoid, and where unavoidable, minimize impacts to known resources. The mitigation measures below are reasonable because they provide appropriate protection for resources through project-level evaluation, treatment (including project design modifications if feasible to avoid or minimize impacts to resources) in accordance with a negotiated Memorandum of Agreement, and monitoring of all grading and earthmoving activity in accordance with an approved monitoring plan. Native American consultation is ongoing.

## Mitigation Measures Related to Archaeological Resources

**AR-1** Prior to the start of construction activity, a qualified archaeologist shall be retained by the TCA or other implementing agency/agencies to perform subsurface test level investigation and surface collection for all archaeological sites that have not had formal determinations of eligibility for listing on the National Register. The test level report evaluating the site shall include discussion of significance (scientific data potential), integrity (location, physical characteristics, and condition), mitigation recommendations, and cost estimates. Final mitigation shall be carried out based on the report recommendations, input by FHWA and SHPO, and a determination as to the site's disposition by the TCA with concurrence of the FHWA. Possible recommendations made by a qualified archaeologist include, but are not limited to, preservation, data recovery, or no mitigation necessary. In addition, TCA or other implementing agency/agencies shall retain a qualified Native American monitor to be present during the evaluation excavations for sites within the project area. Preference will be given to experienced Native American monitors who are members of the local tribal groups identified as having cultural ties to the study area.

**AR-2** In conjunction with the final design, the TCA or other implementing agency/agencies shall retain a qualified archaeologist to complete a suitable historic property treatment plan for all eligible cultural resources that will be impacted by the SOCTIIP. A final report of the data recovery operation shall be submitted to the TCA, Caltrans and FHWA prior to any grading in the archaeological site areas. In addition, TCA or other implementing agency/agencies shall retain a qualified Native American monitor to be present during the treatment program for sites within the project area. Preference will be given to experienced Native American monitors who are members of the local tribal groups identified as having cultural ties to the study area.

**AR-3** Prior to the start of construction activity, the TCA or other implementing agency/agencies shall retain a qualified archaeologist. The archaeologist shall establish procedures (monitoring plan) for archaeological resource surveillance, and procedures for temporarily halting or redirecting work to permit the sampling, identification, and evaluation of the cultural resources as appropriate. The archaeologist shall also be present at the pregrading conference to explain the established procedures based on a preapproved monitoring plan. If additional or unexpected archaeological resources are discovered, a qualified archaeologist shall determine appropriate actions, in cooperation with the TCA, for testing and/or data recovery. The archaeologist shall submit a follow-up report to the TCA that shall include the period of inspection, an analysis of any artifacts found, the results of any testing or data recovery, and the present repository of the artifacts. In addition, TCA or other implementing agency/agencies shall retain a qualified Native American monitor to be present during ground disturbing construction activities within the project area. Preference will be given to experienced Native American monitors who are members of the local tribal groups identified as having cultural ties to the study area.

**AR-4** In conjunction with the final design, the TCA will investigate various design features including options for reversibility of design, i.e., avoidance of core areas, minimization of cut, maximization of fill, bridge structure on columns, etc., in the vicinity of the Village of Panhe (within the San Mateo Archaeological National Register District) could assist in minimizing impacts to the District as a result of the selected Alternative. If it is determined that a design

feature can feasibly assist in minimizing impacts to the District, the TCA will incorporate this feature in the final design for the selected alternative.

### Mitigation Measures Related to Historic Resources

There are no historic resources in the DL for the Preferred Alternative, therefore, no historic resources within the DL for the Preferred Alternative in the Coastal Zone. No mitigation for historic resources is required.

### Management Considerations

The preferred method of managing cultural resources in relation to a proposed project is always avoidance. If the project is unable to avoid impacting a resource, additional steps must be taken to evaluate its eligibility for listing on the National Register. Resources not eligible for listing do not require further management consideration by the project. The additional steps involved in evaluating eligibility for archaeological sites include the following:

- **Extended Phase I Investigations** typically would involve the excavation of limited numbers of STPs and excavation units in order to confirm either the presence or absence of subsurface cultural material. In some instances, such as landforms exhibiting extensive sediment accumulation, mechanical excavation such as backhoe trenches or power augers may be preferable to STPs and units. The potential for buried resources within the DL is high. Additionally, multiple resources are adjacent to the ADI, and the implementation of an extended Phase I investigation would determine whether these resources extend into the ADI. If a resource is located in the ADI, then Phase II studies discussed below are required.
- **Phase II Testing and Evaluation Investigations** typically involve the excavation of a combination of STPs, controlled excavation units, and occasionally mechanical excavations. Whereas Extended Phase I Investigations are primarily concerned with the presence or absence of subsurface cultural material, Phase II Testing and Evaluation Investigations are concerned with not merely the presence of material, but the integrity of its context and the significance of the deposit. Adequate data must be gathered from the study for the researcher to reliably determine whether the resource is eligible for the National Register based on application of the National Register criteria and whether the resource retains integrity.
- **Phase III Data Recovery/Treatment** is necessary when a National Register-eligible resource cannot be avoided by the project. It is then required that measures be taken to ensure that the archaeological information contained within the site is adequately documented. Typically this would entail controlled manual excavation of a percentage of the site area.

All of the steps discussed above would be undertaken only in consultation and with the approval of MCB Camp Pendleton.

Isolates are not considered to be eligible. The question for the current project is whether the two isolates documented within the current project area are truly isolates or whether they represent the only visible portions of sites that are obscured by vegetation or deposition. An extended Phase I program of hand excavations in the vicinity of the isolates should confirm whether these are in fact isolates. If they

are actually portions of sites rather than isolates, and the site is located in the ADI, they must be evaluated through a testing program.

Most of the historical built environment resources are unlikely to be impacted by the project. Their presence outside the project ADI needs to be confirmed. 37-026824 is a power pole with a 1930 date nail. While the expansion and development of the power grid is an important theme in history, the eligibility of this pole is extremely questionable. However, it may contribute to an electric power system that is important. The pole is in the project buffer and will probably be avoided. Sites 37-026825 and 37-026826 are bridges along the old Coast Highway within the 300 ft buffer. Both bridges will be avoided by project impacts based on current design. If project plans change so that the bridges fall within the ADI, further research by an architectural historian will be necessary for these resources to be properly evaluated. Site 37-027520 is Cristianitos Road. Although a segment of the road is within the ADI and project plans include realigning the road, it has been recommended as not eligible for the National Register (Delu, Smith, and McLean 2006) and will not be adversely affected.

Of the previously recorded sites, eligibility for sites CA-SDI-13,324 and CA-SDI-13,325 have been established through consensus consultation with SHPO on MCB Camp Pendleton project P-529. Both sites are in the San Mateo Valley floodplain and may contain additional buried deposits as yet unidentified. The implementation of an extended Phase I program in the ADI is needed. If only small portions of CA-SDI-13,324 and CA-SDI-13,325 are within the ADI, data recovery would be limited to these portions of the sites.

Sites CA-SDI-1,074 and CA-SDI-1,075 appear to be destroyed within the project area. This will need to be confirmed through a proposed extended Phase I program involving subsurface exploration. Either one (or both) of the sites could correspond to the location of the ethnohistoric village of *Hechmai (Quechinga* or *Kecchenga)*. If even small areas of intact archaeological deposits remain within the sites, they have the potential to provide valuable data for the post-contact period in the region. Therefore, it will be vital to ensure that the potential for intact deposits is thoroughly investigated.

CA-SDI-4,412, as observed on the surface, is south of the ADI but within the buffer area. It should be confirmed with an extended Phase I investigation that subsurface elements of the site do not extend into the project ADI. CA-SDI-6,692 could not be relocated during the current survey. The site vicinity should be investigated with an extended Phase I program to determine whether elements of the site are still present.

All sites that are within SMAD (CA-ORA-22/CA-SDI-13,071, CA-SDI-4,282, CA-SDI-4,535, CA-SDI-8,435, CA-SDI-11,703, and CA-SDI-11,929) have been determined to be eligible for the National Register. As such, the portions of these sites that are within the ADI will have to be subjected to treatment, including but not exclusively Phase III data recovery in order to ensure that the archaeological information contained within each site is adequately documented.

In addition to the known resources discussed above, the potential exists for previously unknown sites to be present and exposed by construction activities. Implementation of an extended Phase I investigation involving remote sensing, trenching, and hand excavations should be considered in sensitive areas as part of the Section 106 process. LSA also recommends that areas sensitive for cultural resources be monitored by a qualified archaeologist during all ground-disturbing construction

activities. MCB Camp Pendleton requires that a Native American monitor be present during all site testing, data recovery, and any construction monitoring conducted in support of the proposed project.

When human remains are encountered on Federal Land, 43 CFR 10.4 of the NAGPRA requires that the responsible federal official be notified immediately and that no further disturbance occur in the area until clearance is given by that official and any other involved agencies. If the remains are determined to be Native American Indian, the federal agency will then notify the appropriate Native American tribe and initiate consultation.

To avoid possible project delays, the development of a NAGPRA Comprehensive Agreement among the federal agencies and the federally recognized tribal governments for the undertaking is recommended. An executed binding agreement will adopt a recovery plan (Plan of Action).

## 2.11.5 CONCLUSION

This summary identifies and discusses all known cultural resources within the project area of the SOCTIIP within lands under the authority of the California Coastal Commission. These lands are all located within the boundary of MCB Camp Pendleton. The Coastal Zone in this area of MCB Camp Pendleton extends approximately 0.5 to 0.8 mile inland from the ocean. The project area's DL include the ADI and a 300 ft buffer area around the ADI.

The SMAD is an approximate 180-acre, National Register of Historic Places (National Register) archaeological district that is located in the southwestern portion of the project area, within the Coastal Zone. The SMAD includes six archaeological sites: CA-ORA-22/CA-SDI-13,071, CA-SDI-4,282, CA-SDI-4,535, CA-SDI-8,435, CA-SDI-11,703, and CA-SDI-11,929. The SMAD has been determined eligible under criteria A (contribution to broad and specific patterns of Juaneño history) and D (potential to address issues regarding the prehistory of coastal southern California). Site CA-ORA-22/CA-SDI-13,071 is considered the ethnohistoric Juaneño village of *Panhe*, based on ethnographic data gathered by Kroeber (1976) and Harrington (1934:61) and on the recovery of two glass beads (Romani 1997). Of these six sites that comprise SMAD, all but CA-SDI-8,435 are located within the Coastal Zone. Of the remaining five sites that lie within the Coastal Zone, CA-ORA-22/CA-SDI-13,071, CA-SDI-4,282, CA-SDI-4,535, CA-SDI-8,435, and CA-SDI-11,929 are located within the DL of the SOCTIIP, and CA-SDI-11,703 is located in the buffer.

In March 2005, LSA completed a Phase I systematic reconnaissance survey of the MCB Camp Pendleton portion of the overall SOCTIIP (Fulton, McLean, Smith, and Strudwick 2006). The purpose of the study was to identify all cultural resources 45 years or older within the project. The area involving the SMAD was not resurveyed by LSA since the district has been previously studied and assessed; however, it is discussed herein. The current document is a summary of the recent LSA survey study and those portions of the project area for the Preferred Alternative previously studied as they relate to the Coastal Zone.

Within the Coastal Zone, the recent LSA survey documented six new cultural resources, two of which are prehistoric isolates of one or two items (37-026830 and 37-026831), and four extant historical built environment resources such as roads, power poles, and bridges (37-026824, 37-026825, 37-026826, and 37-027520).

In addition to the SMAD, four previously recorded sites are plotted within the project area (CA-SDI-1,074, CA-SDI-1,075, CA-SDI-13,324 and CA-SDI-13,325). Four of these five site locations were revisited by LSA. Sites CA-SDI-1,074 and CA-SDI-1,075 appear to have been destroyed within the project area, although this needs to be verified as small areas of intact buried deposits may still be present. CA-SDI-13,325 is partially within the project area. The replacement of a wooden power pole with a larger steel pole is planned within CA-SDI-13,324; however, at the time of the survey this was not in the design plan and the site was not visited. In addition, one site, CA-SDI-4,412, is immediately south of the ADI but is within the buffer. The status of all these sites relative to the project ADI and buffer area should be confirmed through implementation of extended Phase I investigations.

Sites CA-SDI-13,324 and CA-SDI-13,325 have been formally determined as eligible for the National Register by MCB Camp Pendleton, with concurrence by the California SHPO. National Register eligibility for these sites has been established through consensus consultation with the SHPO regarding MCB Camp Pendleton Project P-529.

37-027520 is Cristianitos Road, and 37-026824 is a historic power pole. Both were evaluated in a California Department of Transportation HRER (Delu 2006 and Delu, Smith, and McLean 2006) and were recommended as not eligible for the National Register. 37-026825 and 37-026826 are bridges and will be avoided by project impacts; therefore, they were not evaluated in the HRER (Delu 2006 and Delu, Smith, and McLean 2006). If project plans change so that these bridges fall within the ADI, they will need to be evaluated prior to any future project impacts.

The newly identified resources within the project area and buffer will need to be evaluated for listing on the National Register prior to any future project impacts. Isolates are generally not eligible for the National Register; however, given the extremely limited ground visibility in the vicinity of the isolates, their status should be confirmed with extended Phase I investigations.

A mitigation implementation program will need to be developed prior to any disturbances within archaeological sites that have been determined to be eligible for the National Register in order to mitigate potential adverse impacts to there resources.

When human remains are encountered on Federal Land, 43 CFR 10.4 of the NAGPRA requires that the responsible federal official be notified immediately and that no further disturbance occur in the area until clearance is given by that official and any other involved agencies. If the remains are determined to be Native American Indian, the federal agency will then notify the appropriate Native American tribe and initiate consultation.

# 2.12 HAZARDOUS MATERIALS AND HAZARDOUS WASTE SITES

## 2.12.1 INTRODUCTION

Hazardous material concerns associated with the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) include existing sites with hazardous materials that could impact or be impacted by the project and hazardous materials impacts to the environment caused by the construction or operation of the project. The Hazardous Materials and Wastes Technical Report (P&D Consultants 2003) was reviewed to determine the potential impacts related to hazardous materials and hazardous waste sites in the SOCTIIP study area. Hazardous materials and waste sites are addressed in Section 4.17 of the Final SEIR.

## 2.12.2 SETTING

### Study Area Setting

The only existing hazardous materials site of concern due to known or potential environmental contamination in the SOCTIIP study area is the Marine Corps Base (MCB) Camp Pendleton. This site is listed on the National Priorities List (NPL) for leaking underground storage tanks (LUSTs), spills of hazardous substances, and other documented releases of hazardous materials. The NPL is maintained by the Environmental Protection Agency (EPA) and includes sites that pose a major public health hazard and have required remedial action at the federal level. These are often the most important sites because they pose the greatest risk to public health.

Underground utilities cross or are in the immediate vicinity of the Preferred Alternative. These utilities include a natural gas pipeline that runs underneath the existing Interstate 5 (I-5) and San Diego Gas and Electric (SDG&E) and Southern California Edison (SCE) transmission and distribution lines.

I-5 and most of the other roads in the project study area have been operational for a number of years. Potential hazardous materials associated with existing roads, including bridge structures, in the study area may include:

- Older bridge structures may have been constructed with asbestos-containing building materials (ACBM). If bridges or other structures containing ACBMs are disturbed or removed during construction of other transportation improvements such as the proposed SOCTIIP, airborne asbestos could be released.
- The yellow thermoplastic and yellow painted stripes on I-5 and other roads in the study area may contain lead and chromium. If disturbed during construction, these materials could be released into the air.

Many of the roads in the study area have been in use for a number of years, including periods when leaded gasoline was in use. Caltrans has documented the presence of aerially deposited lead (ADL)

along many freeways in California. As a result, it is possible that ADL may be found in soils along roads in the study area. Disturbing these soils during construction could result in the release of lead contaminants into the air.

### Coastal Zone Setting

The MCB Camp Pendleton Gas Station, an existing hazardous materials site of concern, is located in the Coastal Zone adjacent to the SOCTIIP project area disturbance limits. This hazardous materials site is a service station with underground storage tanks (USTs).

Several hazards are associated with the existing I-5 within the Coastal Zone. As stated earlier, the existing roadways and bridge structures may contain asbestos, the yellow thermoplastic and yellow painted stripes may contain lead and chromium, and the soils adjacent to I-5 may contain ADL. The natural gas pipeline that runs underneath the existing I-5 also poses a potential hazard within the Coastal Zone.

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements being required by the Marine Corps. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.12.3 IMPACTS

### Project Impacts

The potential for hazardous materials from existing sites to impact the project and for hazardous materials from project construction and operations to impact the environment were evaluated in the Final Subsequent Environmental Impact Report (SEIR).

Sources of hazardous waste that could impact the SOCTIIP include military sites, pesticides and herbicides on agricultural lands, wastewater treatment facilities, asbestos in existing bridge structures, aerially deposited lead, lead and chromium in lane striping, petroleum pipelines, and construction-related hazards. Table 2.12.A summarizes the potential impacts of the Preferred Alternative related to hazardous materials.

**Table 2.12.A: Impacts of the Alignment 7 Corridor-Far East Crossover-Modified/Preferred Alternative Related to Hazardous Materials**

| Type of Hazardous Material | Number of Sites | Comments |
|---|---|---|
| Military sites | 1 | Potential leaking USTs and other releases (not within disturbance limits) |
| Agricultural lands | Not quantifiable | Potential pesticide and herbicide use |
| Wastewater treatment facilities | 1 | Presence of wastewater treatment chemicals |
| Electrical substations | 2 | Potential disturbance of SDG&E Cristianitos substation and Talega substation |
| Aerially deposited lead | Potentially could occur | Potentially could occur along I-5 and existing arterials |
| Asbestos in existing bridge structures | None known; potentially could occur | Potentially could occur along I-5 and existing arterials |
| Lead and chromium in lane striping | None known; potentially could occur | Potentially could occur along I-5 and existing arterials |
| Abandoned oil wells and test borings | None known; potentially could occur | Potentially present |
| Hazardous materials associated with existing utilities | None known | Potential for existing utilities to leak or be damaged |
| Petroleum pipeline | One buried line | Potential for contaminated soil area at pipeline |
| Construction-related hazards | Within disturbance limits | During construction |

Source: P&D Consultants (2003).

## Construction-Related Hazards

A number of construction-related activities have the potential to result in hazardous materials accidents/releases. These activities primarily are associated with construction equipment refueling and maintenance. Construction may include the limited use of reportable quantities of paints, mineral spirits, batteries, cleaning solvents, and petroleum products. The storage, use, and handling of hazardous materials and generation/disposal of hazardous wastes are strictly regulated by applicable State and federal laws, regulations, and local ordinances. Therefore, under existing State, federal, and local regulations, the contractor would be required to have and maintain storage and handling systems for all hazardous materials on the construction site.

Construction of the Preferred Alternative will require the use of a variety of hazardous materials, some of them potentially flammable or explosive. These materials may include fuels (diesel and gasoline), welding gases and blasting explosives. The handling and use of these materials will be performed under Health and Safety Plans, Emergency Response Plans, and Spill Response Plans that will be developed by the construction contractor and/or the TCA or other implementing agency for the specific build Alternative prior to the beginning of construction.

It is possible that during construction, personnel will encounter previously unknown hazardous materials, for example, an undocumented storage tank. Such an event, if it led to an uncontrolled release, would have the potential for adverse effects to construction personnel or the environment. This risk cannot be quantified or evaluated given the inherent lack of information it entails, but is assumed to be potentially substantial adverse impact.

### Military Sites

Hazardous materials from MCB Camp Pendleton may pose a risk to the Preferred Alternative. Hazardous materials include soil contamination from LUSTs and spills of hazardous substances used for the operation and maintenance of the Marine Base. The UST at the MCB Camp Pendleton service station is not within the disturbance limits of the project and therefore will not pose a risk related to the construction and operation of the Preferred Alternative.

### Wastewater Treatment Facilities

Camp Pendleton provides wastewater collection, treatment, and disposal for the areas in its boundaries. There is a risk of spills of wastewater treatment chemicals present on this facility.

### Asbestos in Existing Buildings and Bridges

Older bridge structures may have been constructed with ACBMs. If bridges or other structures containing ACBMs are disturbed or removed during construction of other transportation improvements such as the proposed project, airborne asbestos could be released.

### Aerially Deposited Lead

Many of the roads in the study area have been in use for a number of years, including periods when leaded gasoline was in use. The California Department of Transportation (Caltrans) has documented the presence of ADL along many freeways in California. As a result, it is possible that ADL may be found in soils along roads in the study area. Disturbing these soils during construction could result in the release of lead contaminants into the air.

### Lead and Chromium in Lane Striping

The yellow thermoplastic and yellow painted stripes on I-5 and other roads in the study area may contain lead and chromium. If disturbed during construction, these materials could be released into the air.

### Petroleum Pipelines

There is a potential for soil contaminated with petroleum to be disturbed during construction near the existing pipeline. In addition, during construction underground pipeline may be disturbed, which could result in the potential for accidental release of hazardous materials.

### Utility Facilities

The primary concern associated with underground and overhead utility facilities is facilities that may include components that contain hazardous materials such as asbestos in agricultural irrigation pipes or facilities that transport hazardous materials such as fuel pipelines. Underground utilities cross or are in the immediate vicinity of the Preferred Alternative. The risk associated with potential hazardous materials for the majority of these underground and aboveground utilities is very low or negligible because most of them do not contain or transport hazardous materials. However, during construction, these facilities may be disturbed, removed, or relocated, which could result in the potential for accidental release of hazardous materials. Disturbance of underground utilities that contain or transport hazardous materials is also strictly regulated by existing local, State, and federal regulations regarding hazardous materials.

The relocation of existing utilities, including SDG&E and SCE electrical transmission and distribution lines, is also included as a component of the Preferred Alternative. However, electromagnetic fields generated by these facilities are not considered an environmental impact. The utility improvements included as part of the Preferred Alternative involve relocation of existing electrical transmission and distribution lines in approximately the same location. The new infrastructure will be at the same voltage as the existing lines; therefore, no increase in electromagnetic field (EMF) exposure is anticipated. The new infrastructure will meet current design standards, including all required insulation.

### Long-Term Impacts

Generally, operation of the Preferred Alternative is not expected to generate long-term hazardous material-related impacts to the environment, other than providing transportation facilities for possible shipment of hazardous materials/cargo similar to other existing and planned roads and in accordance with current regulations regarding the transport of hazardous materials and wastes. The shipment and transport of hazardous materials is strictly regulated by the United States Department of Transportation. Should such shipment take place, the potential exists for accidents involving the spill/release of hazardous materials. The actual accident itself, however, would be a short-term event, unless substantial contamination occurred that would require extended clean-up and remediation measures. The impacts associated with such an accident or release could range from localized and confined events to catastrophic events involving fires and/or toxic releases near populated areas.

There is the potential for spills of toxic and hazardous materials being transported on the proposed facility under the Preferred Alternative. The potential for spills would be approximately the same compared to the potential for spills on other existing roads and freeways in the SOCTIIP study area.

However, the project would introduce a potential new hazard associated with highway transport of hazardous materials to areas not presently subject to this risk. The threats posed by a transportation accident involving hazardous materials include explosions, fires, physical contact by emergency response personnel, potential airborne exposure of the public to contaminants, and surface/ groundwater contamination. The potential for a spill of a toxic and hazardous waste from a vehicle using the Preferred Alternative would be an adverse impact. The cleanup of hazardous materials spills

is strictly regulated by existing federal, State, and local regulations. Any accidental release of hazardous materials or wastes during operation of the Preferred Alternative would be subject to the requirements of a wide range of existing laws and regulations.

### Impacts in Coastal Zone

Impacts related to hazardous materials within the Coastal Zone are similar to those within the entire project area. Impacts from construction related hazards, military sites, asbestos in existing buildings and bridges, ADL, lead and chromium in lane striping, and long-term operation of the SOCTIIP are the same as those discussed above.

The Camp Pendleton wastewater facilities, the SDG&E and SCE electrical transmission and distribution lines, and the petroleum pipelines are not within or adjacent to the Coastal Zone and do not pose any risk related to hazardous material to the Preferred Alternative. However, there is an existing natural gas pipeline beneath the existing I-5 that may pose a short-term construction-related risk during widening of I-5.

## 2.12.4 MITIGATION

The following mitigation measures were developed to avoid or minimize the impacts of the SOCTIIP build Alternatives related to hazardous materials as much as possible, including the Preferred Alternative, and are applicable for construction activities within the Coastal Zone. These measures to safeguard public health will be incorporated into Standard Special Provisions for guidance during final design, and for the construction contractors during final designed construction, respectively. The mitigation measures are also listed in the Mitigation Monitoring and Reporting Program included as Appendix A of this document.

**HM-1** **Testing For Contaminated Groundwater.** Groundwater testing for the presence of pesticides, nitrates, metals, and petroleum hydrocarbons will be required by the Regional Water Quality Control Board (RWQCB) prior to construction in all areas where excavation may extend into groundwater based on final design criteria. All wastewater generated during construction will meet all applicable requirements of the RWQCB prior to disposal.

**HM-2** **Aerially Deposited Lead.** In areas immediately adjacent to existing roads proposed for construction (I-5, arterials), soil samples will be collected and analyzed for lead concentrations during final design, consistent with "Lead Testing Recommendations for Districts with Aerially Deposited Lead (ADL) Variance" (Caltrans 2001), "Invoking the Aerially Deposited Lead Variance" (Caltrans, no date), DTSC "Variance 00-H-VAR-07," and Standard Special Provision SSP 19-900, S5-740. If lead-affected soil is found, the results/conclusions will be included in the Site Investigation Report, the Standard Special Provisions (SSP), and the Material Information Handout (MIH). The SSP and MIH will be incorporated in design specifications and will include measures to safeguard public health before and during construction. Depending on the concentrations and volumes encountered, excavation and disposal of lead-impacted soil may be required. If such excavation is indicated, procedures for handling and disposal will be included in the design specifications. Soil contaminated with ADL will be removed and disposed of in

concurrence with the variance issued to the California Department of Transportation (Caltrans) by the California Department of Toxic Substances Control (DTSC). This material may be reused for embankment fill, retaining wall backfill, and/or capped with an appropriate amount of clean fill material. Specifically, DTSC granted Caltrans a variance in 2000 to allow for the use of some lead-contaminated soils for fill and backfill during construction of freeway improvements, provided that Caltrans handling and use of those soils are consistent with the conditions, limitations, and requirements described in that variance. A copy of the variance is available for review at the Caltrans District 12 office. This variance is valid through September 22, 2005. It is anticipated that all of the lead-contaminated soil in the SOCTIIP study area affected by the Alternatives would be used during construction of the proposed project. Although there is not expected to be the need to remove and dispose of any lead-contaminated soil off site during construction, any excess contaminated soil would be disposed of consistent with all applicable federal, State, and local regulations.

**HM-4** **Abandoned Oil Wells or Test Borings.** The abandoned oil wells and test borings will be positively located, and any remaining components (such as steel surface casings) will be removed before grading for the SOCTIIP build Alternatives. In the event that an undocumented oil well or test boring is encountered during construction of any SOCTIIP Alternative, reabandonment of the well or boring will be implemented to comply with applicable California Department of Oil and Gas (CDOG) requirements.

**HM-5** **Asbestos-Containing Building Materials.** Consistent with the requirements of the South Coast Air Quality Management District (SCAQMD), asbestos sampling and notification will be implemented prior to any demolition or renovation of existing bridges, road structures, or buildings. All asbestos-containing building waste materials will be properly handled and disposed of consistent with all applicable federal, State, and local regulations. Formal notification to SCAQMD will be made at least 10 days before any demolition work, regardless of whether or not asbestos is known to be present.

**HM-6** **Hazardous Materials in Highway Infrastructure.** If any existing thermoplastic or painted traffic stripes on existing roads are proposed for removal, testing of those stripes will be performed prior to construction to assess the level of lead and chromium. The testing will identify specific actions that will be implemented to safely remove and dispose of these stripes. It is also possible that some components of bridges or other highway infrastructure may include asbestos-containing materials (ACM). Building materials in all structures slated for demolition will be surveyed for asbestos content before demolition begins and any materials found to be ACMS will be removed (abated) before demolition, as described in measure HM-5.

**HM-7** **Construction-Related Hazardous Materials.** All construction activities will be required to comply with existing federal, State, and local regulations regarding the handling, use, storage and disposal of hazardous materials, including specific regulations on response in the event of accidental release.

**HM-8** **Hazardous Materials Associated with Existing Utilities.** If leakage or damage from existing utilities is identified during construction, appropriate containment and remedial

measures will be implemented, as necessary, in consultation with the affected utility provider and in compliance with existing local, State, and federal regulations.

**HM-9** **Alignment Specific Database Review.** During final design for the selected Alternative, an updated regulatory database report will be obtained, and regulatory records for identified sites of concern, such as leaking underground storage tank locations, will be reviewed. The intent of obtaining and reviewing this updated information will be to evaluate changes in, or the progress of, ongoing monitoring and remediation activities at those properties within or immediately adjacent to the disturbance limits for the selected Alternative. The results of this additional database and records review will be used in developing the final construction plans and schedules.

Depending on the location, nature, concentrations, and potential risk of chemically affected soil identified prior to and/or during grading activities, remedial measures consistent with the measures provided here may be necessary to minimize impacts to the environment and the public associated with changes in the updated status of identified sites of concern.

**HM-12** **Hazardous Materials Sites.** During final design, existing businesses within the disturbance limits for the selected Alternative will be evaluated related to hazardous materials concerns to identify areas where soil sampling is warranted. Based on this reevaluation, subsurface sampling may be conducted to evaluate the presence of previous chemical releases associated with these types of land uses. Identified contamination will be remediated prior to or during construction of the selected Alternative. The right-of-way acquisition process will specifically address the need for hazardous materials remediation. Remediation, consistent with regulatory requirements and standards, will fully mitigate adverse impacts associated with existing hazardous materials or waste sites on property acquired for the selected Alternative.

**HM-13** **Camp Pendleton.** If the selected Alternative crosses MCB Camp Pendleton, the Department of the Navy (DON) will be consulted and a review of current United States Environmental Protection Agency (EPA) files will be conducted during final design to evaluate whether National Priorities List (NPL) records indicate that hazardous materials releases have occurred beneath the northwestern part of the Base, which may impact the SOCTIIP build Alternative. Current regulatory records pertaining to the integrity of the USTs and associated piping at the MCB Camp Pendleton gas station will be reviewed. In the event that the regulatory files lack records of monitoring or UST integrity test results, subsurface sampling activities will be conducted, including confirmation soil sampling conducted within the disturbance limits of the build Alternative. Evaluation of potentially impacted or environmentally impaired properties will be performed prior to acquisition in order to determine the degree of environmental risk and liability for both the buyer and seller.

**HM-14** **Camp Pendleton.** In the event that an Alternative that traverses a part of Camp Pendleton is ultimately selected for construction, the right-of-way easement granted by the DON to the TCA or other implementing agency (for a non-corridor Alternative) shall contain the following provisions: (1) procedures for control and manifesting of hazardous waste generated by construction or maintenance activities; (2) assignment of responsibility for

hazardous waste management, spill accountability, and hazardous waste disposal (including manifesting); (3) the EPA identification number to be used to manifest hazardous wastes; (4) responsibility for acquisition of any required health permits; (5) procedures for management of hazardous waste stored on Camp Pendleton property; (6) assignment of responsibility for any Notices of Violation or other regulatory enforcement actions occurring within the Alternative right-of-way during construction or operation of the SOCTIIP project.

**HM-18** **Previously Unknown Hazardous Materials Encountered During Construction.** If previously unknown hazardous materials or objects that could contain hazardous materials (such as an undocumented underground storage tank) are discovered during construction, construction personnel will notify TCA or the implementing agency immediately and implement measures to control and characterize the materials encountered, including notification of hazardous materials emergency response personnel as appropriate. Characterization of the possible hazardous materials will be similar to the provisions of HM-12. The construction contractor will provide for this contingency in the Health and Safety Plan for the project.

In the event of an accidental release of hazardous materials or wastes associated with an accident on the transportation facilities under any of the Preferred Alternative, including the corridors, arterials, and I-5, the reporting and cleanup of the spill is strictly regulated by a wide variety of federal, State, and local agencies. Because the transport of hazardous materials and wastes and the remediation of any accidental spills are already addressed by existing local, State, and federal regulations, no specific mitigation measures are required for the Preferred Alternative.

## 2.12.5 CONCLUSION

Impacts within the Coastal Zone related to hazardous materials would be mitigated to below a level of significance based on the mitigation measures listed above and on compliance with existing federal, State, and local regulations regarding hazardous materials and wastes.

# 2.13 VISUAL

## 2.13.1 INTRODUCTION

The Visual Impact Assessment Technical Report (P&D Consultants 2003) was reviewed to determine the potential impacts related to visual resources in the SOCTIIP study area. Potential impacts to visual resources are addressed in Section 4.18 of the Final SEIR.

## 2.13.2 SETTING

### Study Area Setting

The study area for visual resources is within the viewshed of the alignment of the Preferred Alternative. The viewshed is defined as the area within 2,000 meters (m) (1.25 miles [mi]) of the Preferred Alternative alignment that can be seen from the alignment and from which the alignment can be seen.

**Landform and Landcover.** There are five general categories of landcover in the study area: urban-developed, agriculture, weedy, annual grassland, and native vegetation. The urban-developed landcover consists of residential, commercial, industrial, and road uses. These areas contain various types of buildings, paving such as parking lots and roads, and ornamental landscaping. Neighborhood parks and recreation facilities are also included in this landcover type.

Areas that support agriculture such as orchards, nursery fields, and crops comprise the agriculture landcover type. The weedy landcover type consists of areas that support mostly weedy vegetation with few native plants. Annual grassland is usually dominated by nonnative grasses but may have a component of native grasses.

Native landcover consists of areas that support mostly native vegetation with little exotic or introduced vegetation. The native category of landcover has several different subcategories, each with a distinctive appearance, including grassland, scrub, chaparral, oak, and riparian. Scrub landcover typically consists of low-growing perennial shrubs generally less than 2 m (6.6 feet [ft]) high. The predominant plant species are soft-leaved and drought-deciduous, although some evergreen, hard-leaved species may be present. This native landcover typically occurs on the foothills, close to the coast, and on a variety of substrates, slopes, and aspects. Chaparral landcover is characterized by evergreen shrubs up to 4 m (13 ft) high. The vegetation is predominantly evergreen, hard-leaved, and occurs most commonly on north-facing slopes of the foothills, often extending to the coast. Oak landcover is dominated by coast live oak but may include other types of trees and shrubs. Riparian landcover is associated with the bottoms, banks, and occasionally the floodplains of various perennial and intermittent drainages throughout the study area. Dominant plants may include various types of willows, sycamore, and/or mulefat.

**Land Uses in the Study Area.** Much of the south and north parts of the broader SOCTIIP study area contain urban development in cities and unincorporated Orange County. The majority of this development is single-family residential with supporting commercial and retail. The Coto de Caza Planned Community (PC) in the north part of the study area in unincorporated Orange County is nearly built out, but other parts of the study area are currently under development for residential communities. The City of San Clemente and the Telego PC are in the south part of the SOCTIIP study area.

The central part of the SOCTIIP study area is largely undeveloped. Much of the area east of Antonio Parkway/Avenida La Pata is the 9,254-hectare (ha) (22,850-acre [ac]) RMV property. The majority of the RMV property is currently used for ranch operations, including cattle grazing, barley farming, and citrus orchards. Large parts of RMV consist of grazed grasslands, with native chaparral and coastal scrub vegetation on the steeper hillsides. There are also areas of willow associated with the streams and creeks and areas of oaks in drier locations. The Ranch Plan, calling for 14,000 dwelling units (dus), commercial development, and large areas of open space has been approved for the RMV property.

**Wilderness Parks, State Park, and The Donna O'Neill Land Conservancy.** Parts of two wilderness parks operated by the County of Orange are adjacent to the north boundary of RMV in the study area. The County characterizes a Wilderness Regional Park as land that retains its natural character with minimal improvements and that is managed and protected to preserve natural processes. General Thomas F. Riley Wilderness Park, west of Coto de Caza PC, is approximately 202 ha (498 ac). It offers passive recreation through a network of existing multiuse trails that traverse the Park.

Ronald W. Caspers Wilderness Park, also operated by the County of Orange, is a 3,237 ha (8,000 ac) park east of Coto de Caza PC. Caspers Wilderness Park affords opportunities such as camping, picnicking, hiking, horseback riding, mountain biking, photography, nature study, and astronomy. The Park has campgrounds, restrooms and showers, picnic areas, an equestrian campground, and hiking and equestrian trails.

San Onofre State Beach (SOSB) is a state park in the northwestern corner of San Diego County on land leased from MCB Camp Pendleton (Figure 2.13-1). SOSB offers outdoor recreation opportunities including camping, hiking, and surfing. SOSB is operated and managed by the California Department of Parks and Recreation and is comprised of four subunits: Cristianitos, Trestles, Surfer Beach, and Bluffs.

The Donna O'Neill Land Conservancy is a 486 ha (1,200 ac) open space reserve east of the City of San Clemente. It was created in 1991 to preserve and enhance lands throughout the region for educational, ecological, scenic, and open space uses and is owned by RMV.

The Ladera Ranch Land Conservancy contains approximately 648 ha (1,600 ac) of land in the Ladera Ranch PC. It extends from Chiquita Ridge westward to the Arroyo Trabuco.

LSA

FIGURE 2.13-1

*Foothill Transportation Corridor – South*

Uses on MCB Camp Pendleton

SOURCE: Camp Pendleton Special, series V895s, Edition 2-DMA

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**MCB Camp Pendleton.** The western part of the Marine Corps Base (MCB) Camp Pendleton is within the south part of the study area. The Base is the Marine Corps' only amphibious (land and water) training center on the west coast of the United States, with over 50,586 ha (125,000 ac) of land, 29 km (18 mi) of beaches, training areas, ranges, and restricted air space. The uses on the Base in the study area include the SOSB lease area, now defunct, agricultural fields that were leased from the Base, four residential housing areas for Base personnel, three cantonment areas, three ground-training areas, and one amphibious training area, as shown on Figure 2.13-1. The San Mateo Point housing area is west of and immediately adjacent to I-5, and the San Onofre Housing Areas 1 and 3 and mobile homes are north of I-5 and east of the former agricultural fields.

**Sensitive Viewers.** In the SOCTIIP study area, the sensitive viewer groups are residential viewers, including viewers from the historic O'Neill residence, users of wilderness parks, State parks, The Donna O'Neill Land Conservancy, and motorists on designated scenic roads. Residents are sensitive viewers because of the concerns related to changes in the perceived attractiveness of views from their properties and potential changes in property values. Users of wilderness parks, State parks, and the two conservancies are sensitive viewers because part of the expectation of this group includes the enjoyment of the scenic, undeveloped views provided in and/or from these parks. Motorists on designated scenic roads are sensitive viewers because applicable jurisdictions have identified scenic resources and views along these routes that motorists anticipate viewing. No other viewer groups are considered to be sensitive.

### Coastal Zone Setting

The Coastal Zone portion of the SOCTIIP study area is entirely within MCB Camp Pendleton. A portion of the SOSB leasehold is also in the Coastal Zone. Views within the Coastal Zone include the following:

- San Onofre 1 military housing area on MCB Camp Pendleton
- San Onofre State Beach (SOSB)
- SOSB trail
- Upper Trestles surfing area
- San Mateo Point housing on MCB Camp Pendleton.

Sensitive viewers in the Coastal Zone include users of SOSB and residents of San Mateo Point military housing and San Onofre 1 military housing on MCB Camp Pendleton. Motorists along this portion of I-5 would be considered sensitive users because this part of I-5 is designated as scenic by the County of San Diego. Some residents in San Clemente, at higher elevations to the northwest of the alignment, will also have views of the Corridor.

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements. The impacts in the Coastal Zone as

summarized in this report reflect the modified footprint at Basilone Road. Given the location of the vantage points and direction of the views as simulated, it is anticipated that the proposed changes at Basilone Road and the San Onofre gate would not be visible in the view simulations conducted for the Final SEIR.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.13.3 IMPACTS

### Methodology

The methodology for assessing visual impacts for the Preferred Alternative is based on FHWA guidelines contained in the Visual Impact Assessment for Highway Projects (1981) and FHWA Esthetics and Visual Quality Guidance Information (August 18, 1986).

Visual quality is measured based on the visual relationships among the landscape components and was assessed based on three criteria: vividness, intactness, and unity in accordance with the Visual Impact Assessment for Highway Projects (FHWA 1981). None of these three criteria is itself equivalent to visual quality. All three must be high to indicate high visual quality.

- **Vividness.** The memorability of the visual impression received from contrasting landscape components as they combine to form a striking and distinctive visual pattern.
- **Intactness.** The integrity of the visual order in the natural and manmade landscape, and the extent to which the landscape is free from detracting visual features.
- **Unity.** The degree to which the visual components of the landscape join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony or compatibility between landscape components.

The existing visual quality and the visual quality with the Preferred Alternative were evaluated for each of the three criteria and rated on a seven-point rating scale. The rating scale is:

1 Very low

2 Low

3 Moderately low

4 Moderate

5 Moderately high

6 High

7 Very high

The ratings for each of the three criteria (vividness, intactness, unity) were totaled, divided by 3, and compared to the rating scale above to determine the overall visual quality rating. Then, the difference between the existing and with project visual quality was determined. The purpose of the numeric evaluation is to assist in determining the magnitude of the visual change between the existing conditions and the conditions under the Preferred Alternative. A change in visual quality under the Preferred Alternative of 1 or more numeric points from the existing condition rating is considered a substantial impact for sensitive viewers and a less than substantial impact for nonsensitive viewers. This 1 or more point change in visual quality represents a modification such that the typical viewer would be aware of the change and would consider the change to be substantial. The introduction of a project such as a toll road in an undeveloped or mostly undeveloped area would not in itself constitute an adverse visual impact. A substantially adverse visual impact would occur in those situations where the decrease in the vividness, intactness, and unity of the view would be one rating point or more.

The terms 'small part' and 'in the distance' are used to describe the visual elements of various views shown on figures that are described in the text. The term 'small part' is used to indicate the visible extent of an element relative to all the other elements of the view. 'Small part' indicates that, while an element may be obvious, it does not dominate the view when considered with the other elements that comprise the balance of the view.

The term 'in the distance' is used to direct the reader to the location of an element in a view. 'In the distance' does not indicate a specific linear length from the viewer because the term is used to indicate the location of a view element from the point of the viewer relative to the other elements in the view. 'In the distance' refers to elements that are farthest away from the viewer. Often the term refers to hills or ridges that form the backdrop of a view or a location just in front to these elements. Photographs provided in this section have varying depths. Therefore, the most distant element from a viewer in one photograph may be 400 m (1,312 ft), while in another photograph the most distant element may be 6 km or more (3.7 mi). A scale is provided on figures of the alignments that the reader can utilize to determine the distance between view point locations and the project.

The term "regionally outstanding views" is used to describe views that provide wide panoramic views of extensive areas of valleys and ridges that are largely undeveloped. These views are considered to have an especially high quality because of the contrasting landforms, landcovers, and view elements within them that combine to form a vivid and harmonious view scene, as described in the FHWA Visual Impact Assessment for Highway Projects definition of high quality.

This methodology is described in greater detail in the Visual Impact Assessment Technical Report (P&D Consultants 2003).

## Project Impacts

Immediately following construction of the Preferred Alternative, the cut, fill, and graded areas will highly contrast with adjacent areas because they will be devoid of vegetation. This impact would be substantially adverse to sensitive viewers and adverse but less than substantial to nonsensitive viewers. However, these areas will be seeded or planted consistent with species in the adjacent areas. Once this vegetation becomes established, the contrast between the existing and with project

conditions will be considerably reduced. The analysis of project impacts in this section are described for mitigated conditions five years following completion of project construction.

Assessment Units (AU) were identified for the Preferred Alternative, and the visual impacts were evaluated for each AU. Because of the linear nature of the Preferred Alternative, the variety of topography that is crossed (including developed and undeveloped areas and presence of intervening features that would block views of the alignments) cannot be seen at one time from one location. Therefore, rather than treating the visual impacts of the project as a single unit, the Preferred Alternative was divided into AU. An AU is the segment of a project alignment that is within the viewshed of one or more sensitive viewer groups, if sensitive viewers can see the segment. If no sensitive viewers can see the segment, then the AU was identified based on the similarity of visual resources along the alignment. This section only discusses AUs that are within the Preferred Alternative.

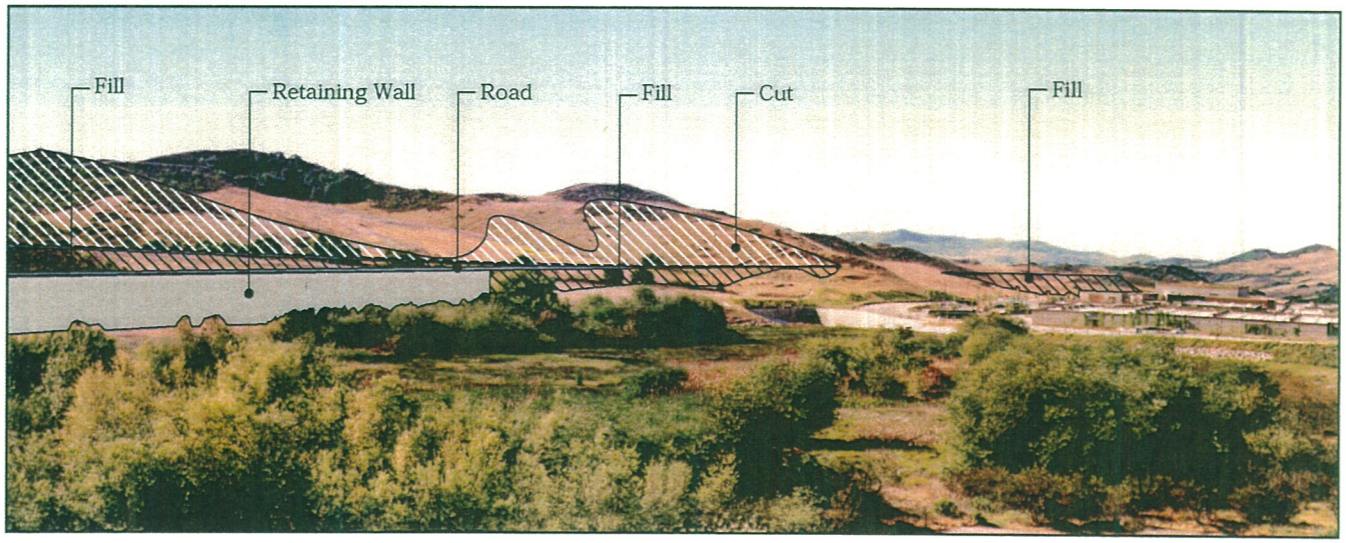
**Assessment Unit 1-5.**

**Assessment Unit 1-5 Location and Project Elements.** This AU begin north of Oso Parkway and extend to the south into Cañada Chiquita. Project elements in AU1-5 include remedial grading, cut and fill, the travel lanes, access ramps to and from Oso Parkway, and a sound wall adjacent to Tesoro High School. AU1-5 also includes a retaining wall adjacent to Oso Parkway.

**Project Impacts and Change in Visual Quality of AU1-5.** As shown in the wireframes on Figure 2.13-2, there would be fill and a retaining wall added at the base of the hill in the left of the view for the toll road and access ramp that will extend from Oso Parkway south to the highway surface. The edge of the road surface and vehicles will be visible on the top of the fill. A sound wall adjacent to Tesoro High School will also be visible.

The following with project visual quality rating is for the mitigated conditions five years following completion of project construction. The addition of the fill that will obscure the bottom part of the ridge in the left of the view will change the vividness of the view from moderately high (rated 5) to moderate (rated 4) because this change will be in the foreground view of drivers on Oso Parkway. The presence of the fill slopes, edge of the toll road, access ramp, and cars in the foreground view of drivers along Oso Parkway would slightly reduce the intactness but the rating would remain moderate (rated 4) because of the presence of the other developed uses at Tesoro High School. The unity of the visual components would remain moderate (rated 4) because the straight plane of the fill slopes and straight line of the edge of the toll road and access ramp would echo the shape and line of the Tesoro High School access road to the right of the view. Implementation of the Preferred Alternative would slightly increase the straight-line elements in the overall curvilinear scene. However, this addition would not change the rating from moderate. The overall visual quality rating with the project conditions would be moderate ($4 + 4 + 4 = 12$; $12/3 = 4$). This change of 0.33 point in the visual quality rating would be an adverse but less than substantial impact of the project for AU1-5.

View Point 1 - Existing Conditions Photo




AU1-5 - With-Project Wireframe

LSA

FIGURE 2.13-2

*Foothill Transportation Corridor - South*

AU1-5 - Existing Conditions Photo and With-Project Wireframe

View Point 1 - From Oso Parkway Looking South

SOURCE: P&D Consultants and Psomas (2003)

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From the Ladera Ranch Land Conservancy west of the alignment, viewers on the ridge at its east edge would have views of the alignment to the northeast. These views would also include Tesoro High School, Oso Parkway, and the existing FTC north of Oso. The visual quality impact of the project on these views would be adverse but less than substantial because of the other developed uses in the view.

**Impacts on Regionally Outstanding Views in AU1-5.** There are no regionally outstanding views in the viewshed of AU1-5. Therefore, there are no project impacts related to regionally outstanding views associated with this AU.

**Impacts on Community Character in AU1-5.** There are no community elements or landmarks along AU1-5 that will be removed or altered for implementation of the Preferred Alternative. Therefore, there will not be any adverse impacts on community elements or landmarks.

Oso Parkway adjacent to this AU is designated by the County of Orange as a scenic viewscape corridor. The Preferred Alternative would result in an adverse but less than substantial impact on views for motorists on Oso Parkway. Therefore, the Preferred Alternative would not conflict with County policies related to scenic viewscape corridors and would not result in an adverse impact related to these policies.

**Assessment Unit 31-2.**

**Assessment Unit 31-2 Location and Project Elements.** AU31-2, shown on Figure 2.13-3, begins at the south end of AU37 (described later) west of Cristianitos Road and extends along a low ridge before crossing the Land Conservancy on a north/south alignment. Project elements in AU31-2 include remedial grading, cut and fill, the toll road travel lanes and realigned ranch and The Donna O'Neill Land Conservancy roads. AU31-2 includes a quarry access road undercrossing.

Modifications incorporated into the Preferred Alternative included changes to the location of the road undercrossing in AU31-2. Consultation with the California Department of Fish and Game (CDFG) and the United States Fish and Wildlife Service (USFWS) resulted in the determination that this was not a desirable location for a wildlife crossing due to its proximity to the Talega development. For this reason, the wildlife crossing was shifted north. The road undercrossing shown in the visual simulation will be filled and vegetated. A cross culvert will be installed to facilitate drainage. Modifications incorporated into the Preferred Alternative did not result in other changes to the project elements listed above.

**Impacts on Visual Quality of AU31-2.** The unmitigated visual simulation of Figure 2.13-4 shows the area of the view that will be altered with implementation of the project. The travel lanes will be visible in the center of the view. The Preferred Alternative will be limited to six lanes. There will be substantial areas of cut and fill as well as a bridge, resulting in the removal of large areas of chaparral.

LSA

NOTE: Figure reprinted from SOCTIIP Draft EIS/SEIR

FIGURE 2.13-3

*Foothill Transportation Corridor – South*

Assessment Unit 31-2

SOURCE: CDMG and P&D Consultants (2002)

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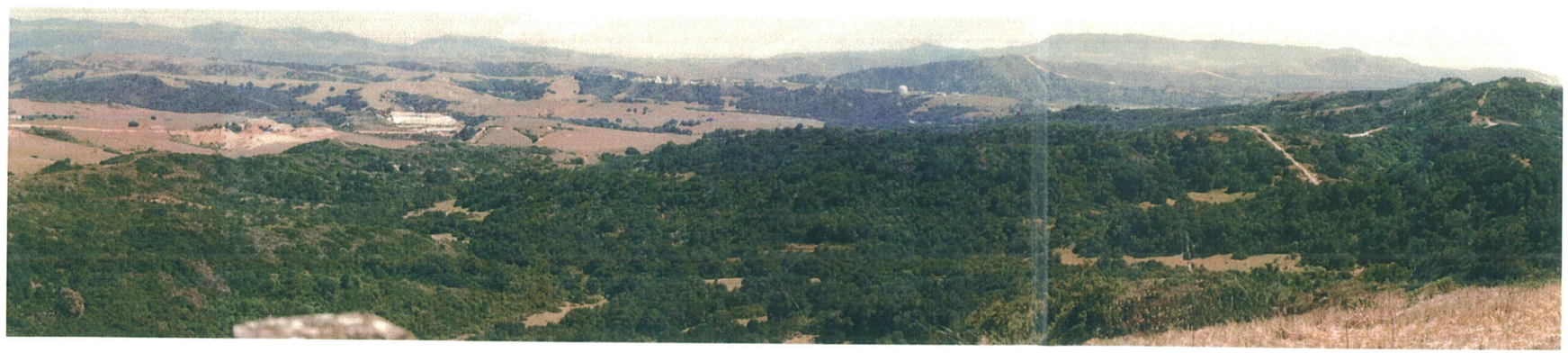
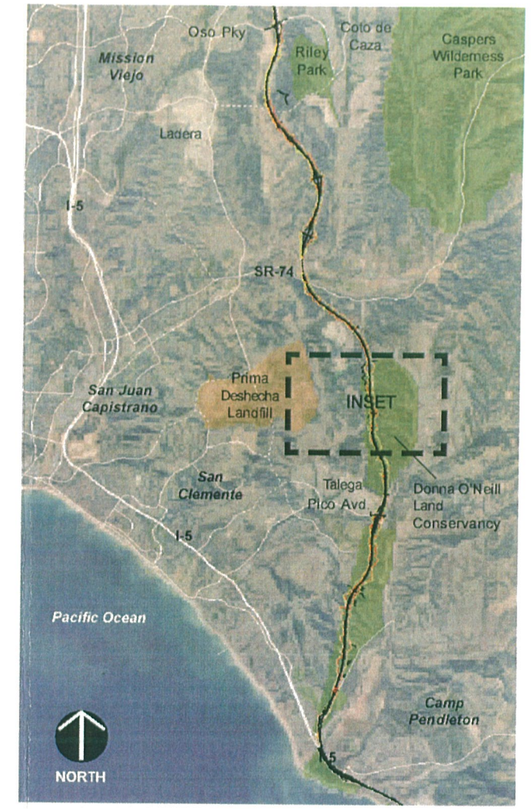
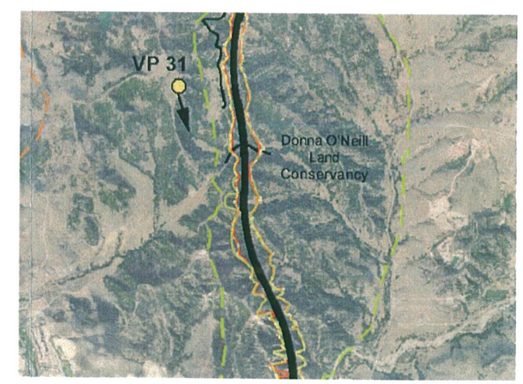
*Mitigated Visual Simulation (5 Years)*

*Unmitigated Visual Simulation*



*Existing Conditions*




Approx Scale 1 48,000

LSA

FIGURE 2.13-4

*Foothill Transportation Corridor – South*

Visual Simulation AU 31

Viewpoint 31

From Donna O'Neal Land Conservancy Looking East

SOURCE: Psomas (2002, 2003)

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The following with project visual quality rating is provided for the mitigated project 5 years following completion of construction, as shown in the mitigated visual simulation. The vividness of the view would not appreciably change from moderately high (rated 5) because the areas of cut and fill following establishment of vegetation will blend with the surrounding areas, and the paved travel lanes will not highly contrast with the other components of the view. The intactness rating would change from high (rated 6) to moderate (rated 5) because of the amount of the toll road travel lanes and the bridge that will be visible in the view. The unity of the visual components would change from high (rated 6) to moderately high (rated 4) because of the straight line of the road and bridge that will interrupt the curvilinear pattern of the ridges. Because the number of toll road travel lanes is limited to a maximum of six lanes and the road undercrossing was shifted north in the Preferred Alternative, impacts related to intactness and unity are somewhat reduced for this alternative. The overall visual rating of AU31-2 with the project conditions would be moderately high (5 + 5 + 4 = 14; 14/3 = 4.7). This change in visual quality of 1.0 rating point would be substantially adverse for visitors to The Donna O'Neill Land Conservancy.

**Impacts on Regionally Outstanding Views in AU31-2.** There are no regionally outstanding views in the viewshed of AU31-2. Therefore, there are no project impacts related to regionally outstanding views associated with AU31-2.

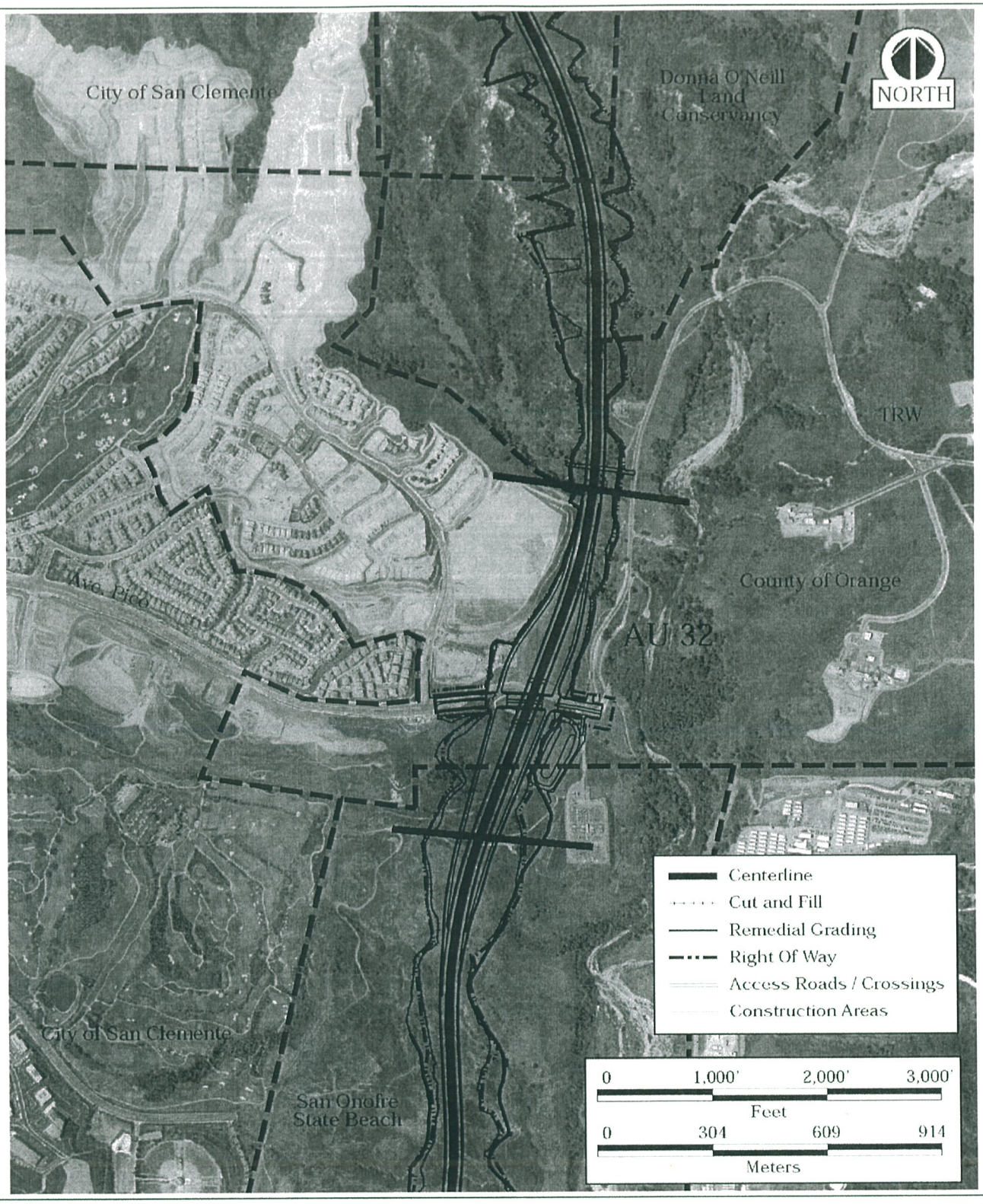
**Impacts on Community Character in AU31-2.** There are no community elements or landmarks within this AU. Therefore, there will not be any adverse impacts on community elements or landmarks.

The goal of the privately-owned Donna O'Neill Land Conservancy is to preserve the land in the reserve for educational, ecological, recreational, scenic, and conservation purposes. The alignment along AU31-2 would eliminate scenic resources in the Land Conservancy by the removal of substantial amounts of vegetation, and alteration of the ridges with cut and fill and would substantially reduce the visual quality of views on the conservancy as described previously. These changes will be in foreground views of visitors to The Donna O'Neill Land Conservancy. Therefore, the Preferred Alternative would conflict with the goal of The Donna O'Neill Land Conservancy to preserve scenic resources and would result in a substantial adverse impact related to those policies.

The Preferred Alternative within AU31-2 would result in the removal of a substantial number of oak trees, which the County recognizes as a resource. Therefore, the Preferred Alternative would conflict with County policy and would result in a substantial adverse impact related to this policy.

**Assessment Unit 32.**

**Assessment Unit 32 Location and Project Elements.** AU32 starts at the south end of AU31-2 in the south part of The Donna O'Neill Land Conservancy and extends south/southwest, ending on a hill south of Avenida Pico, as shown on Figure 2.13-5.




LSA

FIGURE 2.13-5

NOTE: Figure reprinted from SOCTIIP Draft EIS/SEIR

*Foothill Transportation Corridor – South*

Assessment Unit 32

SOURCE: CDMG and P&D Consultants (2003)

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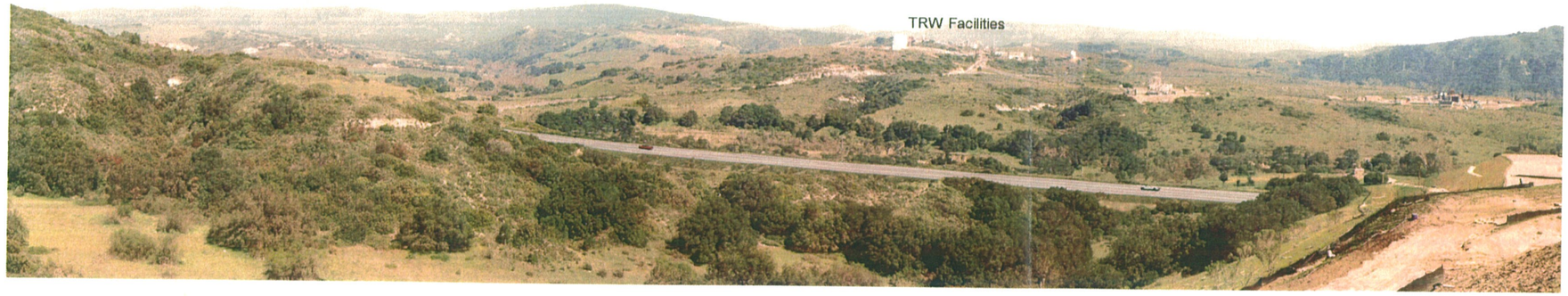
The project elements for AU32 include remedial grading, cut and fill, the toll road travel lanes, a crossing at Avenida Pico, access ramps to and from Avenida Pico, access ramp toll plazas on the southbound on-ramp and the northbound off-ramp at Avenida Pico, sound walls on the east part of the Talega development, and the slight vertical realignment of the access road to the electrical substation south of Avenida Pico.

**Impacts on Visual Quality of AU32.** As seen in the visual simulation on Figure 2.13-6, the unmitigated and mitigated project will have approximately the same amount of contrast with the existing conditions. The with project rating of visual quality is given for the mitigated condition. Project elements include fill, removal of riparian vegetation and the road surface, and vehicles that will be visible along a narrow horizontal band at the base of the hills in the valley below the viewer. With implementation of the project alignment in AU32 the vividness would change from high (rated 6) to moderately high (rated 5) because the riparian vegetation, on the valley floor that contributes to the vividness of the view will be largely screened from view by the fill slope that supports the road. A sound wall adjacent to residences in the Talega PC closest to the Avenida Pico access ramps, which are beyond the right edge of this view, will block views of these project elements and views to the east. The intactness of the view would be reduced slightly with the addition of the road surface to the view. However, this feature combined with the TRW facilities would not change the rating from moderate (rated 4). The unity of the visual components would change from moderately high (rated 5) to moderate (rated 4) because the straight line of the road surface would moderately interrupt the overall curvilinear pattern of the view components and will divide the view in half horizontally. Because the number of toll road travel lanes is limited to a maximum of six lanes in the Preferred Alternative, impacts related to intactness and unity would be slightly reduced for this alternative. The overall visual rating of the mitigated with project conditions from this view point would be moderate (5 + 4 + 4 = 13; 13/3 = 4.33). This change in visual quality of 0.67, less than 1 point, would be an adverse but less than substantial visual impact of the project in AU32 from this view point in Talega and from views from The Donna O'Neill Land Conservancy. The sound wall, which will block the open views to the east from adjacent residences, would be a substantially adverse visual impact on these residences.

**Impacts on Regionally Outstanding Views in AU32.** There are no regionally outstanding views in the viewshed of AU32. Therefore, there are no impacts related to regionally outstanding views in AU32.

**Impacts on Community Character in AU32.** There are no community elements or landmarks that will be removed for implementation of AU32. Therefore, there will not be any adverse impacts on community elements or landmarks.

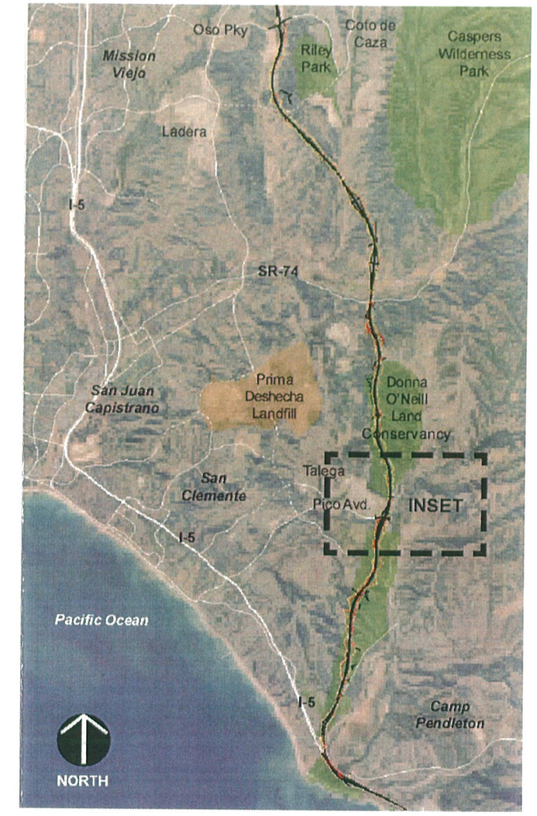
Implementation of the alignment through AU32 would not conflict with any defined policies, and therefore, this segment of the project would not result in adverse impacts related to policies.

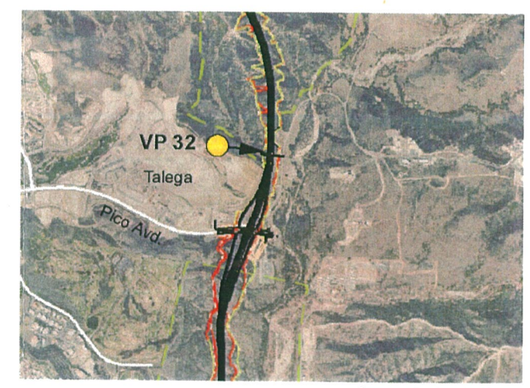



*Mitigated Visual Simulation (5 Years)*

*Unmitigated Visual Simulation*

*Existing Conditions*




Approx. Scale: 1. 48,000

LSA

FIGURE 2.13-6

*Foothill Transportation Corridor – South*
Visual Simulation AU 32
Viewpoint 32
From Donna O'Neal Land Conservancy Looking East

SOURCE: Psomas (2002, 2003)

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## Assessment Unit 33.

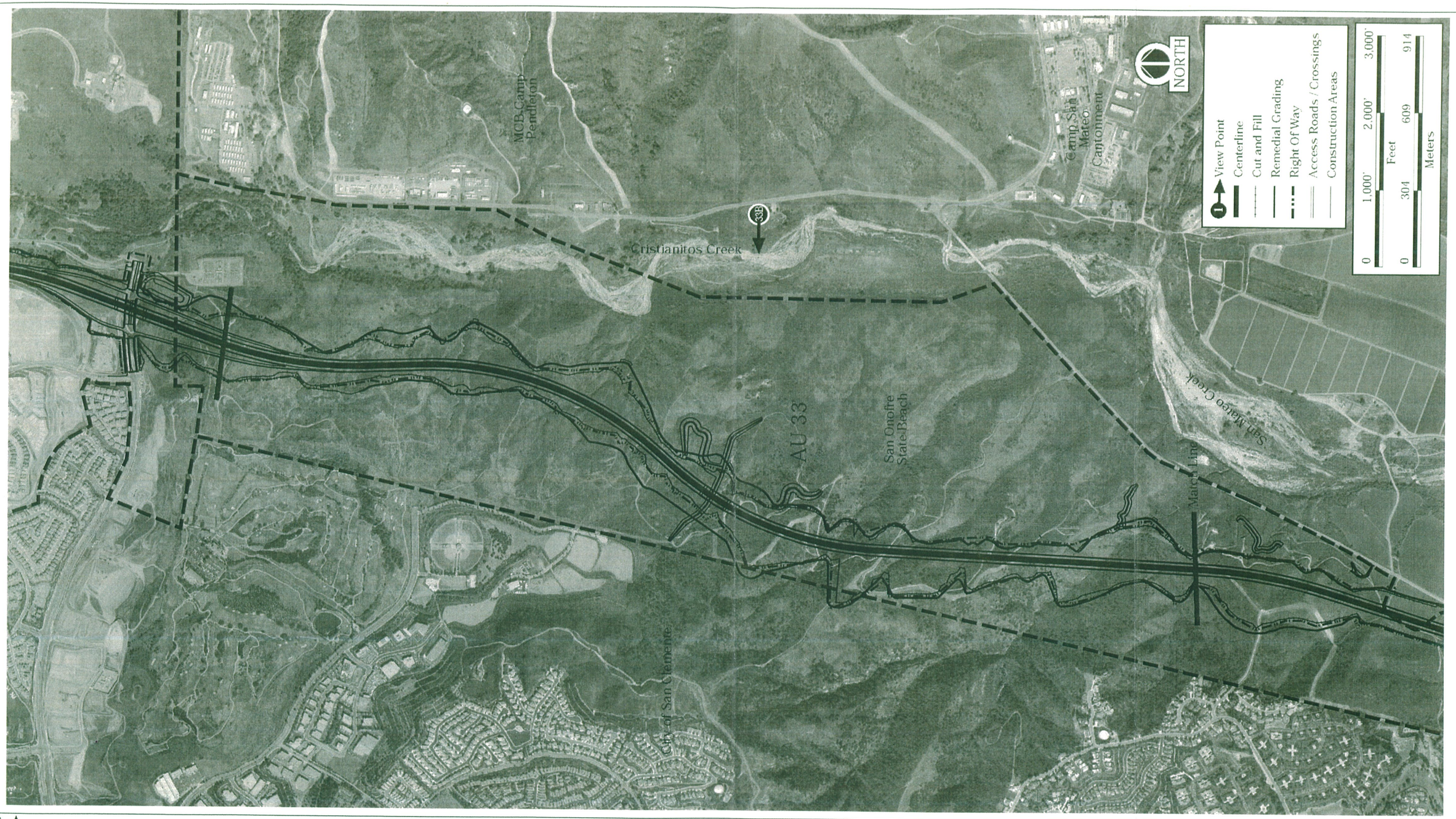
**Assessment Unit 33 Location and Project Elements.** The project alignment in AU33 is shown on Figure 2.13-7. AU33 is in the south part of Cristianitos Canyon and the San Mateo Creek Valley. The unit begins at the south end of AU32 on the hill adjacent to the south side of Avenida Pico, extends south across the Cristianitos subunit of SOSB, and connects to I-5.

The project elements in AU33 would include remedial grading, cut and fill, the toll road travel lanes, realignment of Cristianitos Road over the toll road, an interchange at Cristianitos Road to and from the north only, the realignment of several unimproved access roads in SOSB, retaining walls and a sound wall in SOSB, a sound wall at the edge of residences west of the alignment, an I-5 connector to and from the south only, a bridge over San Mateo Creek at I-5, reconstruction of the existing I-5/Basilone Road interchange with no direct connection to and from Basilone Road, slight widening of I-5 south of Basilone Road to accommodate the toll road connection to I-5, widening of I-5 bridges at San Onofre Creek, and sound walls north and south of I-5 south of Basilone Road. The Preferred Alternative will be limited to a maximum of six lanes. Additionally, AU33 has a sound wall east of the San Mateo Point Housing area on Camp Pendleton, west of I-5.

Modifications incorporated into the Preferred Alternative included changes to the height of the retaining wall and the centerline of the toll road in AU33. In consultation with CDFG and USFWS, the centerline of the toll road was shifted 15 feet to the east to avoid Pacific pocket mouse habitat. The shift allowed for a reduction in the height of the proposed retaining wall. The Preferred Alternative will include a retaining wall with a maximum height of 3 feet. Modifications incorporated into the Preferred Alternative did not result in other changes to the project elements listed above.

**Visual Quality Impacts on Views from San Onofre 1 Housing Area Looking Northwest (View Point 33B).** The unmitigated visual simulation of Figure 2.13-8 shows the area of the view that will be altered with implementation of the project. The project elements will be visible along a narrow horizontal band at the base of the hills in the background beyond the agricultural fields. These elements include cut and fill, a retaining wall left of center, and an elevated structure in the left of the view. The edge of the toll road is also visible as well as the sound wall west of San Mateo Campground.

The following with project visual quality rating is provided for the mitigated project 5 years following completion of construction, as shown in the mitigated visual simulation. The vividness of the view will remain moderately high (5) because only a narrow band of the view will change at the base of the hills in the distance, and the silhouette of the hills that frame the view scene will not change. The intactness rating would change from moderately high (rated 5) to moderate (rated 4) because the long retaining wall and elevated structure, although a small part of the view, will detract from the overall view. The unity of the visual components would remain high (rated 6) because the diagonal line of the edge of the toll road and elevated structure against the hills will not substantially interrupt the existing visual pattern of agricultural fields and the hills in the background. The overall visual rating of the mitigated with project conditions from this view




LSA

NOTE: Figure reprinted from SOCTIIP Draft EIS/SEIR

FIGURE 2.13-7
PAGE 1 OF 2

*Foothill Transportation Corridor – South*
Assessment Unit 33

SOURCE: CDMG and P&D Consultants (2003)

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LSA

NOTE: Figure reprinted from SOCTIIP Draft EIS/SEIR

FIGURE 2.13-7
PAGE 2 OF 2

*Foothill Transportation Corridor – South*
Assessment Unit 33

SOURCE: CDMG and P&D Consultants (2003)

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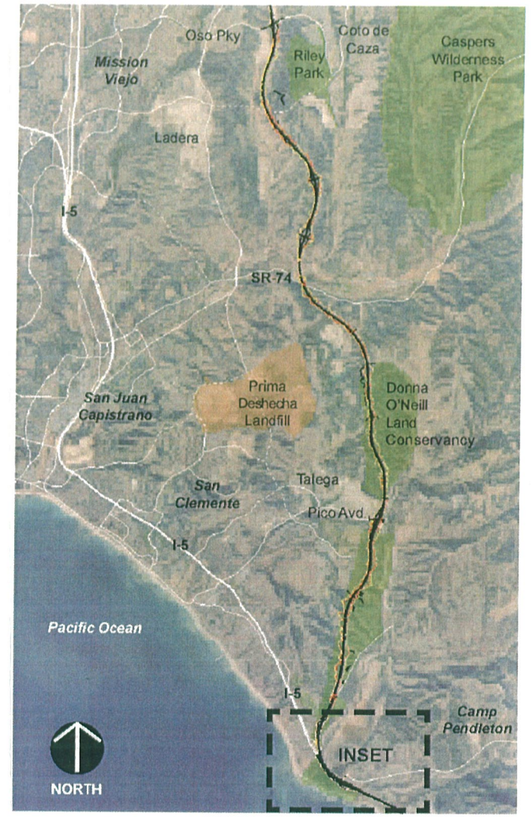
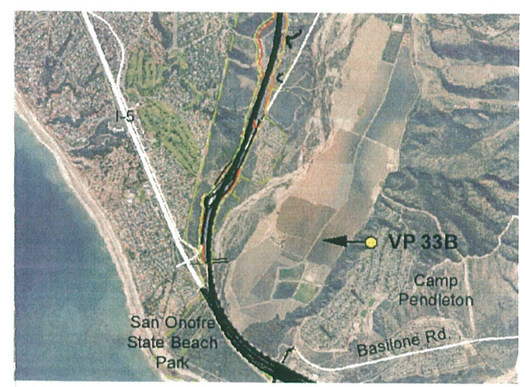
*Mitigated Visual Simulation (5 Years)*

*Unmitigated Visual Simulation*

*Existing Conditions*




Approx. Scale: 1 60,000

LSA

FIGURE 2.13-8

*Foothill Transportation Corridor - South*

Visual Simulation AU 33

Viewpoint 33b

Looking West from San Onofre Housing, Camp Pendleton

SOURCE: KTUA, 1998, with Modifications by Psomas, 2003

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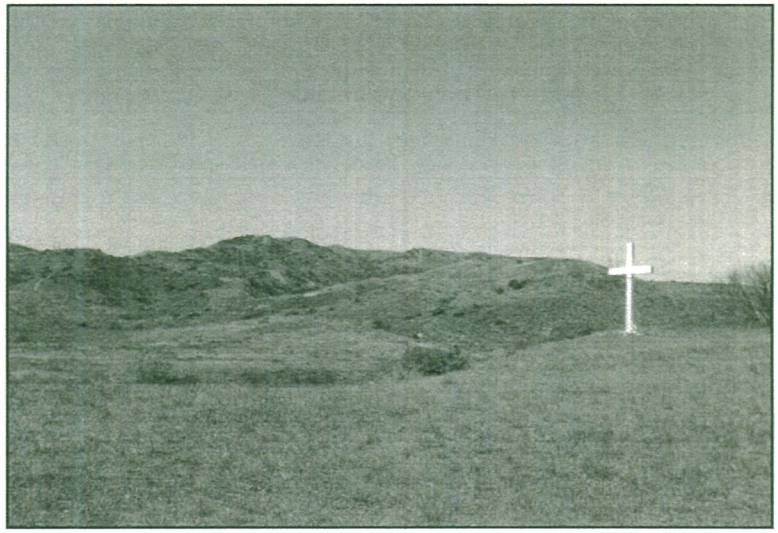
point is moderately high (5 + 4 + 6 = 15; 15/3 = 5). This change of 0.30 in the visual quality rating would be an adverse but less than substantial impact on residential viewers in the San Onofre Housing 1 area.

**Visual Quality Impacts on Views from San Onofre 1 Housing Area of AU33 Looking South.** The impacts of the elevated structure of the connector ramps on views from San Onofre 1 Housing were described previously for View Point 33B. Residents in the south part of this housing unit will have closer views of this structure along with the existing views of I-5. The connector ramps will be below the elevation of the housing area and will not obstruct ocean views from this area because the ramp profile does not extend above the adjacent vegetation and slopes. Therefore, the visual quality impacts of the project in AU33 on views from the San Onofre 1 Housing area to the south will not be adverse.

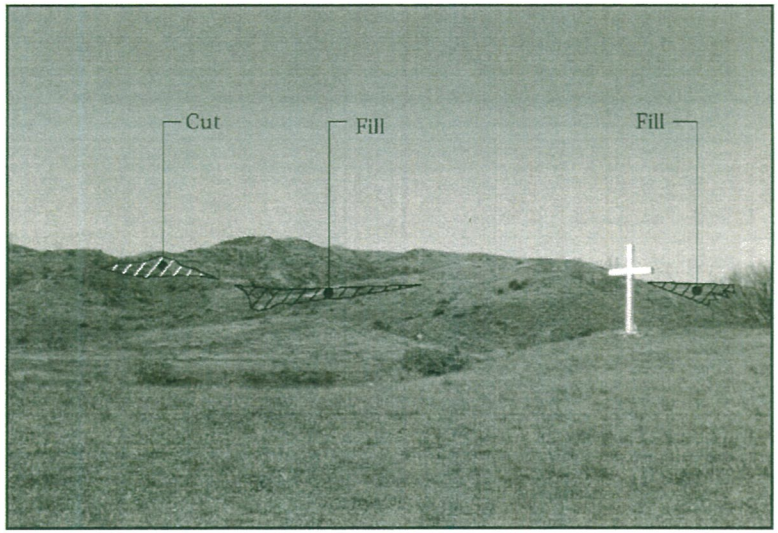
**Visual Quality Impacts on Views from Camp Pendleton North of Camp San Mateo Cantonment Looking Northwest (View Point 33C).** The wireframe of the project conditions in Figure 2.13-9 shows the area of grassland and scrub that will be removed for cut and fill in this view. The edge of the toll road and the vehicles on it will be visible in the center part of this view. This area is visible from the Camps Talega, Cristianitos, and San Mateo cantonments on Camp Pendleton. Following mitigation, when vegetation that blends with the area has grown on the cut slope, the vividness, intactness, and unity of the view would be similar to the existing conditions. Therefore, the visual quality rating would remain moderate (rated 4.3), and there would not be an adverse impact on visual quality. The mission of MCB Camp Pendleton is military training and a visual alteration that would affect its ability to train would be considered adverse. The minor visual change related to this view point would not hinder training operations. Therefore, there will not be an adverse impact from this view point related to the Camp Pendleton training mission.

**Visual Quality Impacts on Views from San Onofre State Beach Trail Looking Northeast (View Point 33D).** The unmitigated visual simulation of Figure 2.13-10 shows the area of the view that will be altered with implementation of the project. The elevated connector ramps over I-5 will introduce a second straight-edged feature into the view. This feature is visible above the existing I-5 structure in the distance but below the tops of the trees that screen parts of the structure in this view.

Project mitigation will not be visible in this view; therefore, the unmitigated and mitigated visual simulations are the same. It should be noted that the existing vegetation will continue to mature and may provide some additional screening of the proposed connector ramp. Implementation of the project will change a small part of the view, but none of the existing landscape elements will be removed or changed. Therefore, the vividness of the view will remain moderate (rated 4). The intactness would be reduced from moderate (rated 4) to moderately low (rated 3) because the elevated structure above I-5 would detract from the view. The unity of the visual components would remain moderately high (rated 5) because the addition of the straight line of the elevated structure above the existing I-5 will not substantially interrupt the existing visual pattern. The



View Point AU33 - Existing Conditions Photo




View Point AU33 - With-Project Wireframe

LSA

FIGURE 2.13-9

NOTE: Figure reprinted from SOCTIIP Draft EIS/SEIR

*Foothill Transportation Corridor - South*

AU33 - Existing Conditions Photo and With-Project Wireframe

View Point 33C - From Camp Pendleton North of Camp San Mateo Cantonment Looking Northwest

SOURCE: KTUA, P&D Consultants and Psomas (2003)

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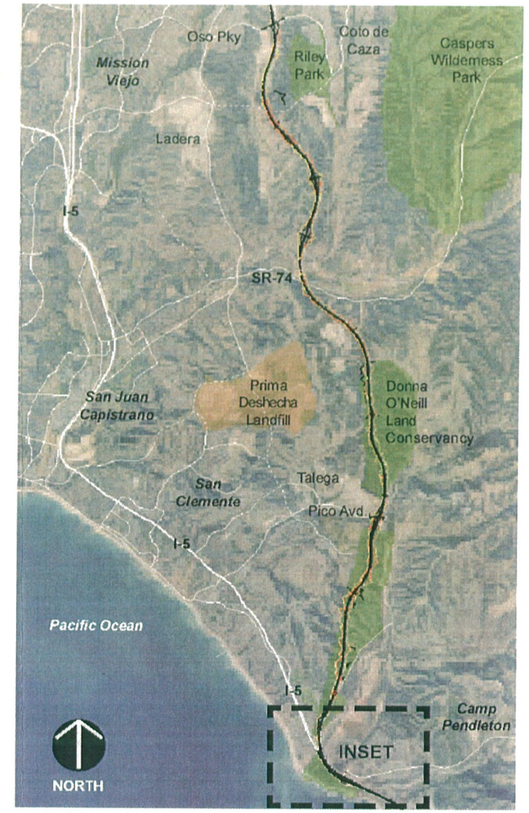
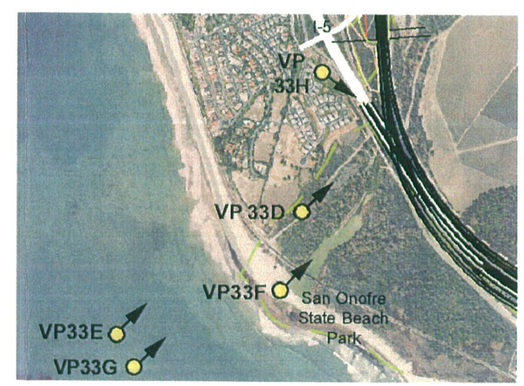
*Mitigated Visual Simulation (5 Years)*

*Unmitigated Visual Simulation*

*Existing Conditions*




Approx. Scale: 1: 24,000

LSA

FIGURE 2.13-10

*Foothill Transportation Corridor – South*

Visual Simulation AU 33

Viewpoint 33d

From San Onofre State Beach Trail Looking NE to Interstate 5

SOURCE: KTUA, 1998

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overall visual rating of the with project conditions from this view point is moderate (4 + 3 + 5 = 12; 12/3 = 4). Therefore, the change in visual quality rating of 0.30 point with the project from this view point would be an adverse but less than substantial impact.

Portions of the proposed Green Beach improvements will be visible from the Trestles Beach trail (although not from Trestles Beach) and from Old Highway 1. The improvement that may be visible include the construction of a 50-foot-wide improved roadway under the southeast abutment of the I-5 San Mateo bridge crossing. This change in view would occur as trail users look toward existing I-5. There would be no change in views of the ocean as a result of the Green Beach improvements. This change in the visual quality is an adverse but not substantial impact.

**Visual Quality Impacts on Views from Upper Trestles Surfing Area Looking Toward San Mateo Creek (View Point 33E).** The unmitigated visual simulation of Figure 2.13-11 shows the area of the view that will be altered with implementation of the project. The elevated connector ramp is visible between the bluffs on the right and left of the view, below the top of the distant hills but above the line of trees in the central part of the view. The light color and engineered line of the concrete connector ramp will contrast with the other view components.

Project mitigation will not be visible in this view; therefore, the unmitigated and mitigated visual simulations are the same. Implementation of the connector ramps will change a small part of the view, but none of the existing landscape elements will be removed or changed. Also, the ramp will not be visible above the horizon line. Therefore, the vividness of the view will remain moderately high (rated 5). The intactness would be reduced from high (rated 6) to moderately high (rated 5) with the introduction of the elevated connector ramp. The unity of the visual components would be reduced from high (rated 6) to moderately high (rated 5) because of the strong line of the connector ramp that somewhat interrupts the pattern between the trees and ridge in the distance. The overall visual rating of the with project conditions from this view point is moderately high (5 + 5 + 5 = 15; 15/3 = 5). This change in visual quality rating of 0.67 would be an adverse but less than substantial impact of the project from this view point.

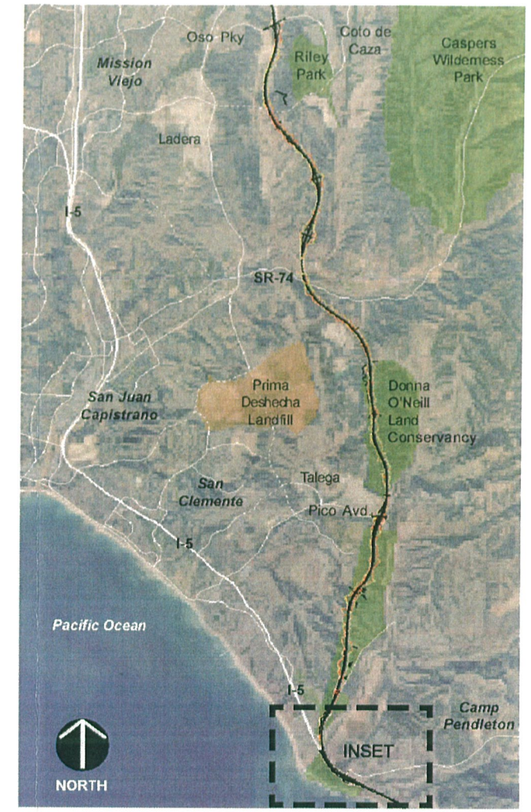
**Visual Quality Impacts on Views from San Onofre State Beach Looking Northeast Toward Basilone Road (View Point 33F).** The unmitigated visual simulation of Figure 2.13-12 shows the area of the view that will be altered with implementation of the project. The elevated connector ramp is visible below the housing pad on the left of the view. The light color and engineered line of the concrete connector will contrast with the other view components.

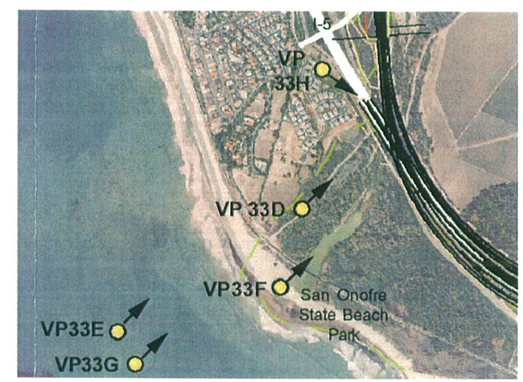
Project mitigation will not be visible in this view; therefore, the unmitigated and mitigated visual simulations are the same. The connector ramps will change a small part of the view but none of the existing landscape elements will be removed or changed. Also, the ramp will not be visible above the horizon line. Therefore, the vividness of the view will remain moderately high (rated 5). The intactness would be reduced from moderately high (rated 5) to moderate (rated 4) with the introduction of the elevated connector ramp. The unity of the visual components would remain high (rated 6) because the straight line of the structure is a small part of the view, echoes the straight edge of the grassland area, and will not substantially interrupt the existing visual pattern.

*Mitigated Visual Simulation (5 Years) - Same as unmitigated*

*Unmitigated Visual Simulation*

*Existing Conditions*




Approx. Scale: 1: 24,000

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FIGURE 2.13-11

*Foothill Transportation Corridor – South*

Visual Simulation AU 33

Viewpoint 33e

From Upper Trestles Surfing Area Looking NE to San Mateo Creek

SOURCE: KTUA, 1998

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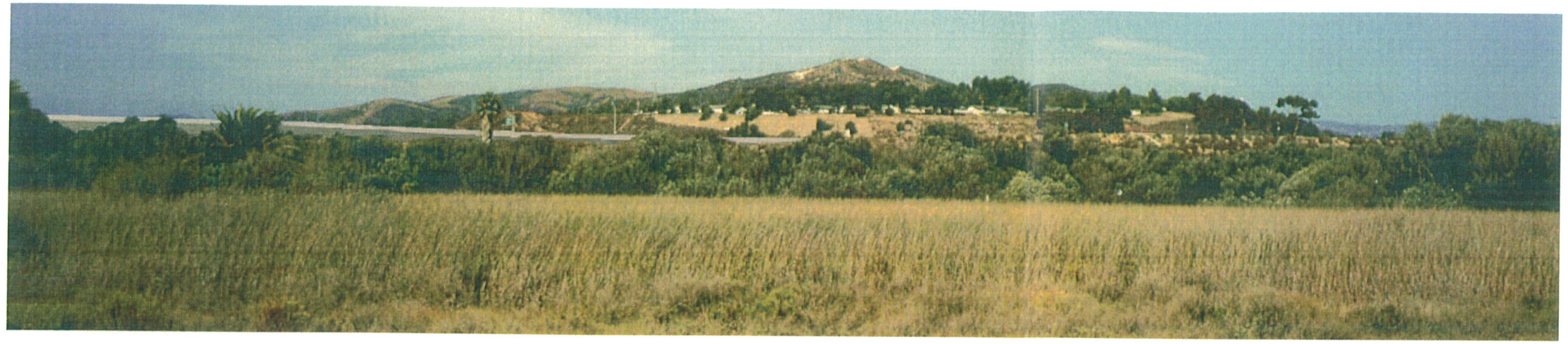
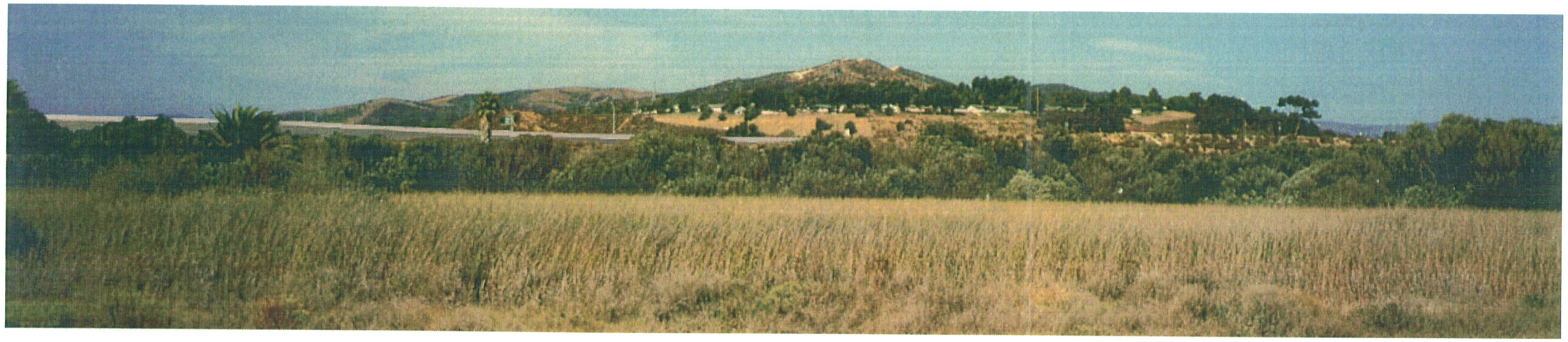
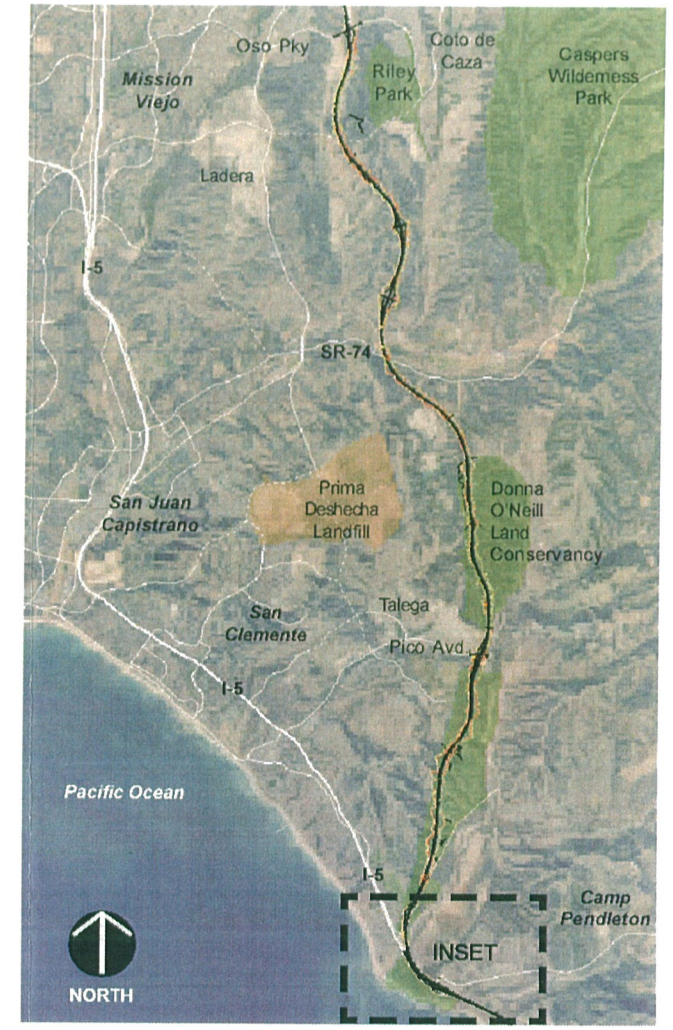


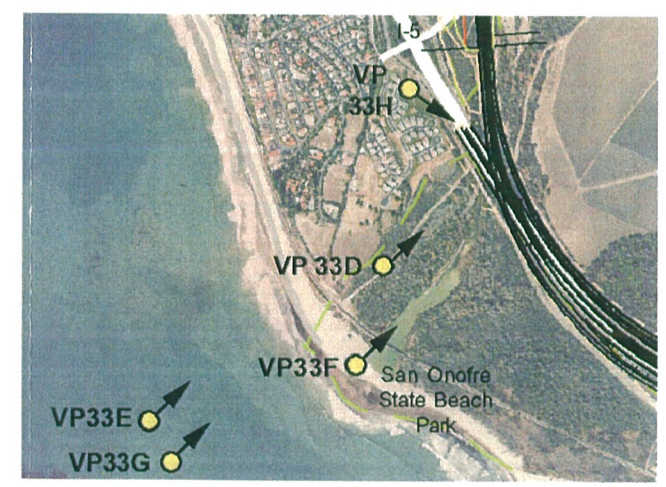
*Mitigated Visual Simulation (5 Years) - Same as unmitigated*



*Unmitigated Visual Simulation*

*Existing Conditions*




Approx. Scale: 1: 24,000

LSA

FIGURE 2.13-12

*Foothill Transportation Corridor – South*

Visual Simulation AU 33

Viewpoint 33f

From San Onofre State Beach Looking NE to Basilone Road

SOURCE: KTUA, 1998

I:\TCA531\Coastal Zone Analysis\Fig 2.13-12.cdr (3/22/07)

The overall visual rating of the with project conditions from this view point is moderately high (5 + 4 + 6 = 15; 15/3 = 5). This change in visual quality rating of 0.30 would be an adverse but less than substantial impact of the project from this viewpoint.

**Visual Quality Impacts on Views from Upper Trestles Surfing Area Looking Northeast Toward Basilone Road (View Point 33G).** Figure 2.13-13 shows the existing conditions photo and unmitigated and mitigated visual simulations of the project in AU33 from a view point in the Upper Trestles surfing area near the view point in Figure 2.13-11 but looking northeast toward Basilone Road. The view point location, View Point 33G, is shown on Figure 2.13-13. Although the landform is slightly different than shown previously in Figure 2.13-11, the landscape components, visual character, and visual quality rating are the same as described for the view toward San Mateo Creek in Figure 2.13-11. Project mitigation will not be visible in this view, so the mitigated and unmitigated visual simulations are the same.

The visual simulation of the with project conditions in Figure 2.13-13 shows that the I-5 connector ramp will be visible to the left of the bluff in the right side of the view. The ramp is visible at the base of the hills in the distance. The light color and engineered line of the concrete connector will contrast with the other view components. A shorter segment of the ramp is visible in this view than in the view from The Donna O'Neill Land Conservancy looking east.

As with the previous view in Figure 2.13-11, implementation of the connector ramps will change a small part of the view, but none of the existing landscape elements will be removed or changed. Also, the ramp will not be visible above the horizon line and very little of the hills in the background will be concealed by the ramp. Therefore, the vividness of the view will remain moderately high (rated 5). The intactness would be reduced from high (rated 6) to moderately high (rated 5) with the introduction of the project structure. The unity of the visual components would change from high (rated 6) to moderately high (rated 5) because the straight horizontal band of the connector would detract from the curvilinear pattern of the ridge and tree line silhouette in front of the ridge. The overall visual rating of the with project conditions from this view point is moderately high (5 + 5 + 5 = 15, 15/3 = 5.0). This change in visual quality rating of 0.67 would be an adverse but less than substantial impact of the project from this viewpoint.

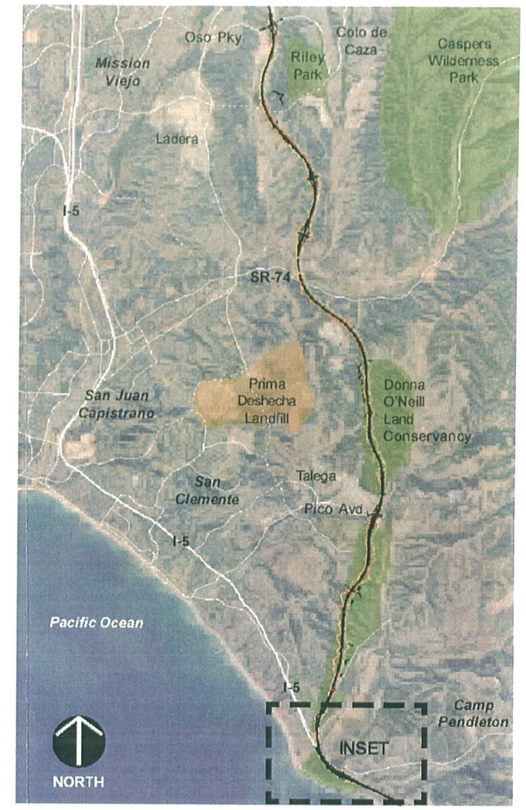
**Visual Quality Impacts on Views from San Mateo Point Housing Looking Southeast (View Point 33H).** The unmitigated visual simulation of Figure 2.13-14 shows the area of the view that will be altered with implementation of the project but without the sound wall. This was done so that the elevated connector ramp, which will be hidden from view by the sound wall shown in the mitigated visual simulation, can be seen. Project mitigation will not be visible in either the unmitigated or mitigated view.

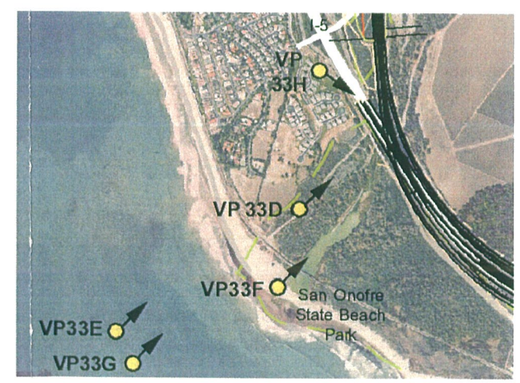
As shown in the mitigated visual simulation, the sound wall will obscure all of the existing view behind it except for the crest of the ridge in the background, and the sound wall will become the dominant feature in the view. Therefore, the vividness of the view will change from moderate (rated 4) to low (rated 2). The intactness would be reduced from moderate (rated 4) to low (rated 2) with the introduction of the sound wall. The unity of the visual components would change from moderate (rated 4) to low (rated 2) because the pattern of hills and ridges behind I-5 will be

*Mitigated Visual Simulation (5 Years) - Same as unmitigated*

*Unmitigated Visual Simulation*

*Existing Conditions*




Approx. Scale: 1: 24,000

LSA

FIGURE 2.13-13

*Foothill Transportation Corridor - South*

Visual Simulation AU 33

Viewpoint 33g

From Upper Trestles Surfing Area Looking NE to Basilone Road

SOURCE: KTUA, 1998

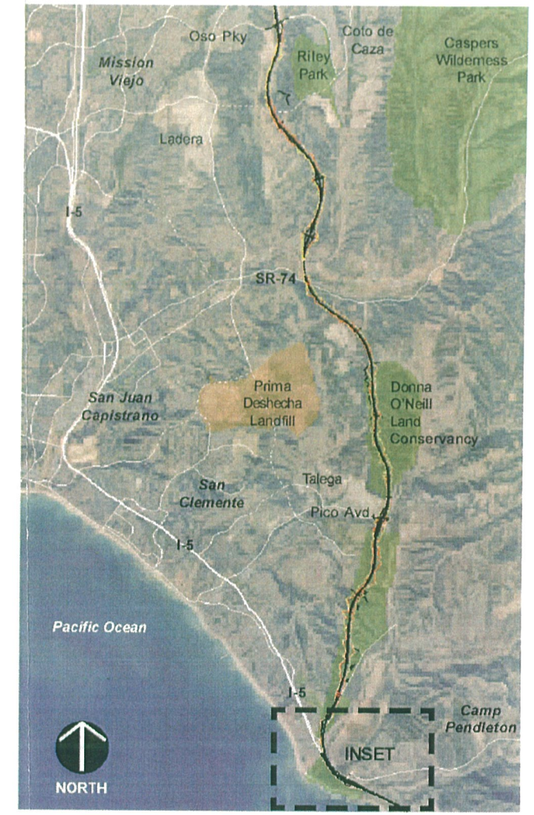
I:\TCA531\Coastal Zone Analysis\Fig 2.13-13.cdr (3/9/07)

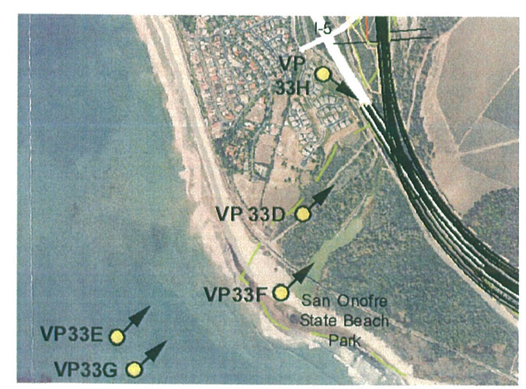
*Mitigated Visual Simulation (5 Years) - includes soundwall*

*Unmitigated Visual Simulation - without soundwall*

Note: Soundwall is an element of the project, but not shown in unmitigated simulation to reveal other project elements such as retaining walls, elevated structures, and cut/fill when comparing alignments.

*Existing Conditions*




Approx. Scale: 1: 24,000

LSA

FIGURE 2.13-14

*Foothill Transportation Corridor – South*

Visual Simulation AU 33

Viewpoint 33h

Looking Southeast from San Mateo Point Housing

SOURCE: Psomas 2002, 2003

I:\TCA531\Coastal Zone Analysis\Fig 2.13-14.cdr (3/22/07)

eliminated from the view. The overall visual rating of the with–project conditions from this view point is low (2 + 2 + 2 = 6; 6/3 = 2.0). This change in visual quality rating of 2.0 points would be a substantial adverse impact of the project from this view point.

**Impacts on Regionally Outstanding Views in AU33.** There are no regionally outstanding views in the viewshed of AU33. Therefore, there are no project impacts related to regionally outstanding views associated with AU33.

**Impacts on Community Character in AU33.** There are no elements or landmarks identified as important to the community within this AU that will be removed for implementation of the project. Therefore, there will not be any adverse impacts on community elements or landmarks.

The SOSB General Plan identifies scenic resources, including geomorphic features and vegetation, to be of great importance, and it is SOSB policy to protect these resources from all degrading and undesirable intrusions. The removal of vegetation, including sage scrub, and the cut-and-fill alterations of the landform in SOSB would conflict with this policy. Partial view blockages would occur for westbound drivers on Cristianitos Road in SOSB. The alignment through AU33 would conflict with the SOSB General Plan policies and goals. The blockage of views from Cristianitos Road in SOSB is not consistent with this policy. Therefore, implementation of the project along AU33 would have a substantial adverse impact related to adopted SOSB policies and plans. However, the lease agreement with the Department of the Navy (DON) to allow SOSB on military land is subordinate to the DON-reserved right to convey rights-of-way for road through the leasehold upon consultation with State Parks.

The County of San Diego has designated I-5 from the City of Oceanside city limits north to the Orange County border as a Scenic Route. The County identifies any physical change that will substantially affect the viewshed of a designated scenic highway to have a significant visual effect on the highway. Implementation of the connector ramps that cross I-5 will introduce a long, elevated structure to the views of the densely vegetated San Mateo Creek area and the agricultural fields north of I-5. The connector ramps will be in the foreground view of motorists and would substantially and adversely change the viewshed to the northeast. The southern part of the connector ramps will also obstruct ocean views for motorists on I-5. Therefore, implementation of the project along the south part of AU33 would have a substantial adverse impact related to adopted policies and plans of San Diego County.

The changes in visual quality related to the alignment through AU33, as described in this section, would not reduce the training capability on MCB Camp Pendleton. Therefore, there would be no adverse impacts on Camp Pendleton training policies related to visual resources.

### Assessment Unit 36.

**Assessment Unit 36 Location and Project Elements.** The project alignment along AU36 is shown on Figure 2.13-15. The AU begins at the south end of AU1-5 on the ridge that separates Cañada Chiquita from Cañada Gobernadora to the east, and the unit extends south along the east

LSA

NOTE: Figure reprinted from SOCTIIP Draft EIS/SEIR

SOURCE: CDMG and P&D Consultants (2003)

I:\TCA531\Coastal Zone Analysis\Fig 2.13-15.cdr (3/22/07)

FIGURE 2.13-15

*Foothill Transportation Corridor - South*

Assessment Unit 36

slope of the ridge. Project features within the AU include remedial grading, cut and fill, the travel lanes, and a mainline toll plaza. Ramps and related improvements to C Street are not part of the proposed project. These improvements will be constructed by others. The Preferred Alternative will be a maximum of six lanes. In response to the anticipated reserve design for the Southern NCCP, the alignment of the Preferred Alternative was shifted to the east side of the canyon in the Middle Chiquita area.

**Visual Quality Impacts on Views from West Ridge Trail in Caspers Wilderness Park Looking West (View Point 36).** The unmitigated visual simulation of Figure 2.13-16 shows the area of the view that will be altered with implementation of the project. A part of the ridge on the far side of the valley in the left part of the view will be altered by cut and fill.

The following with project visual quality rating is provided for the mitigated project 5 years following completion of construction, as shown in the mitigated visual simulation. Implementation of the project alignment in AU36 as seen from Caspers Park would not appreciably change the vividness from very high (rated 7) because once vegetation is established on the cut-and-fill areas, the contrast with the rest of the view will be minimal and only a small part of the existing view of the ridge will be obscured. The intactness of the view would be reduced slightly with the introduction of the straight line of the alignment, but the rating would not change from high (rated 6). The unity of the visual components would be reduced slightly, but the rating would not change from very high (rated 7). This is because the diagonal straight line of the roadway is a small part of the view and would minimally interrupt the overall curvilinear pattern of the view. The overall visual rating of the mitigated with project conditions from this view point would remain the same as the existing conditions (high, rated 6.67). Therefore, there would not be an adverse visual impact of AU36 on views from Caspers Park.

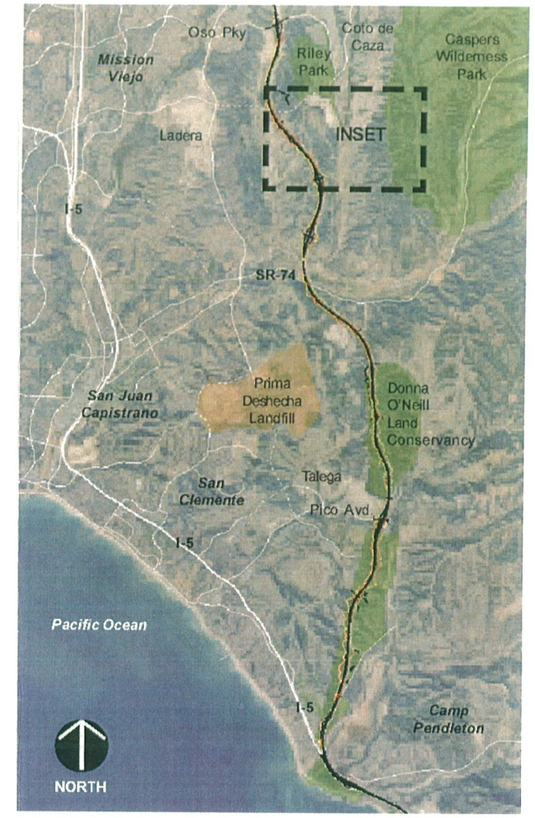
**Visual Quality Impacts on Views From Coto De Caza Looking South.** Some residents of the south part of Coto de Caza will see a small part of the alignment in cut and fill in the distance south of Coto de Caza on the east slope of the west ridge of Cañada Gobernadora. These visual impacts would not be adverse because of the small amount of the alignment that would be visible and because existing residences in Coto de Caza would be closer elements in the view. Thus, the landscape already has developed elements. A small amount of the alignment would be visible, and Coto de Caza residences would continue to be closer elements in the view.

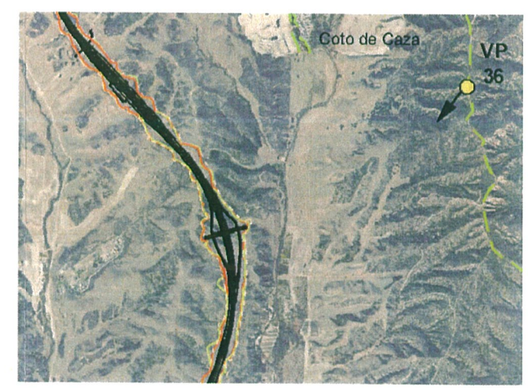
**Visual Quality Impacts on Views from Riley Wilderness Park in AU36.** Hikers in Riley Wilderness Park on the upper elevations of the Vista Ridge Trail and the Skink and Horned Toad Trails in the northwest part of the park will see a small part of the alignment on fill in the distance to the south. This visual impact would not be adverse because of the small amount of the alignment that would be visible and because residences in Coto de Caza are visible between the viewer and the alignment. Thus, the landscape already has developed elements. The Preferred Alternative would be closer to Riley Wilderness Park; however, a small amount of the alignment would be visible, and Coto de Caza residences would be located between the viewer and the alignment.

*Mitigated Visual Simulation (5 Years)*

*Unmitigated Visual Simulation*

*Existing Conditions*




Approx. Scale: 1: 48,000

LSA

FIGURE 2.13-16

*Foothill Transportation Corridor – South*

Visual Simulation AU 36

Viewpoint 36

View from West Ridge Trail in Casper's Park Looking SW

SOURCE: Psomas 2002, 2003

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**Impacts on Regionally Outstanding Views in AU36.** AU36 is within a regionally outstanding view from the West Ridge Trail in Caspers Wilderness Park. As described previously for AU36, the mitigated visual simulation for this location shows that the alignment is below the elevation of the trail and does not block the view. Also, the change in the quality of the view will not be adverse. Therefore, the project impacts in AU36 related to regionally outstanding views would not be adverse. Modifications incorporated into the Preferred Alternative do not result in a new project impact in AU36 related to regionally outstanding views.

AU36 is within the viewshed of regionally outstanding view E, shown on Figure 2.13-17. The location of View Point E, south of Ortega Highway, is shown on Figure 2.13-18. However, the project elements in this AU will be in the distance and will be a very small part of the view. Therefore, the impact of the project on this regionally outstanding view would be adverse but less than substantial. Also, there are no sensitive viewers from this view point.

**Impacts on Community Character in AU36.** There are no community elements or landmarks along AU36 that will be removed or altered for implementation of the project. Therefore, there will not be any adverse impacts on community elements or landmarks associated with AU36.

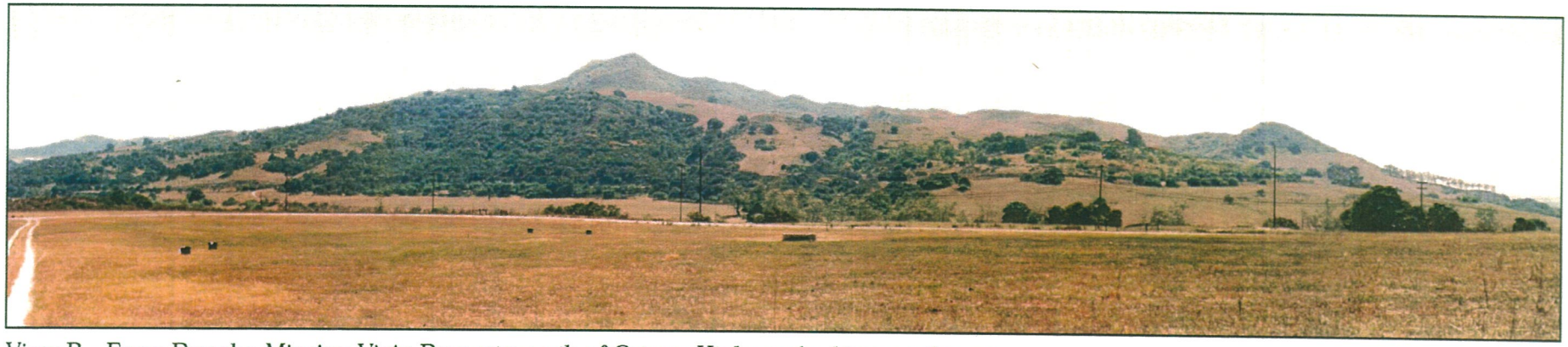
Implementation of the project in AU36 will not conflict with adopted plans or policies relating to visual and aesthetic resources. Therefore, there will be no impacts of the project in AU36 related to adopted plans and policies.

**Assessment Unit 37.**

**Assessment Unit 37 Location and Project Elements.** AU37 is shown on Figure 2.13-19. AU37 begins at the south end of AU36 on the east side of the ridge that separates Cañada Chiquita from Cañada Gobernadora and extends south along the ridge, across San Juan Creek and Ortega Highway, and ends south of Ortega Highway west of Cristianitos Road. Project elements in AU37 include remedial grading, cut and fill, the toll road travel lanes, one bridge over San Juan Creek at the mainline, an elevated structure over Ortega Highway, and ramp toll plazas on the southbound on-ramp and the northbound off-ramp at Cow Camp Road. The Preferred Alternative will be a maximum of six lanes. In addition, the alignment was shifted to the northeast to reflect the approved Ranch Plan. The modified alignment allows for the consolidation of the adjacent development areas.

**Visual Quality Impacts on Views from Ortega Highway Looking Southeast (View Point 37A), from the Historic O'Neill Residence and from Residences in RMV.** The unmitigated visual simulation of Figure 2.13-20 shows the area of the view that will be altered with implementation of the project. The travel lanes, vehicles, bridge, and support columns will be visible in the left of the view. The fill slope north of Ortega Highway, the elevated structure over Ortega Highway, and the cut slope south of Ortega Highway are in the right of the view.

View A -From West Ridge Trail in Ronald W. Caspers Wilderness Park looking west.



View B - From Rancho Mission Viejo Property north of Ortega Highway looking southwest.

LSA

FIGURE 2.13-17

*Foothill Transportation Corridor - South*

Regionally Outstanding Views

SOURCE: P&D Consultants (2002)

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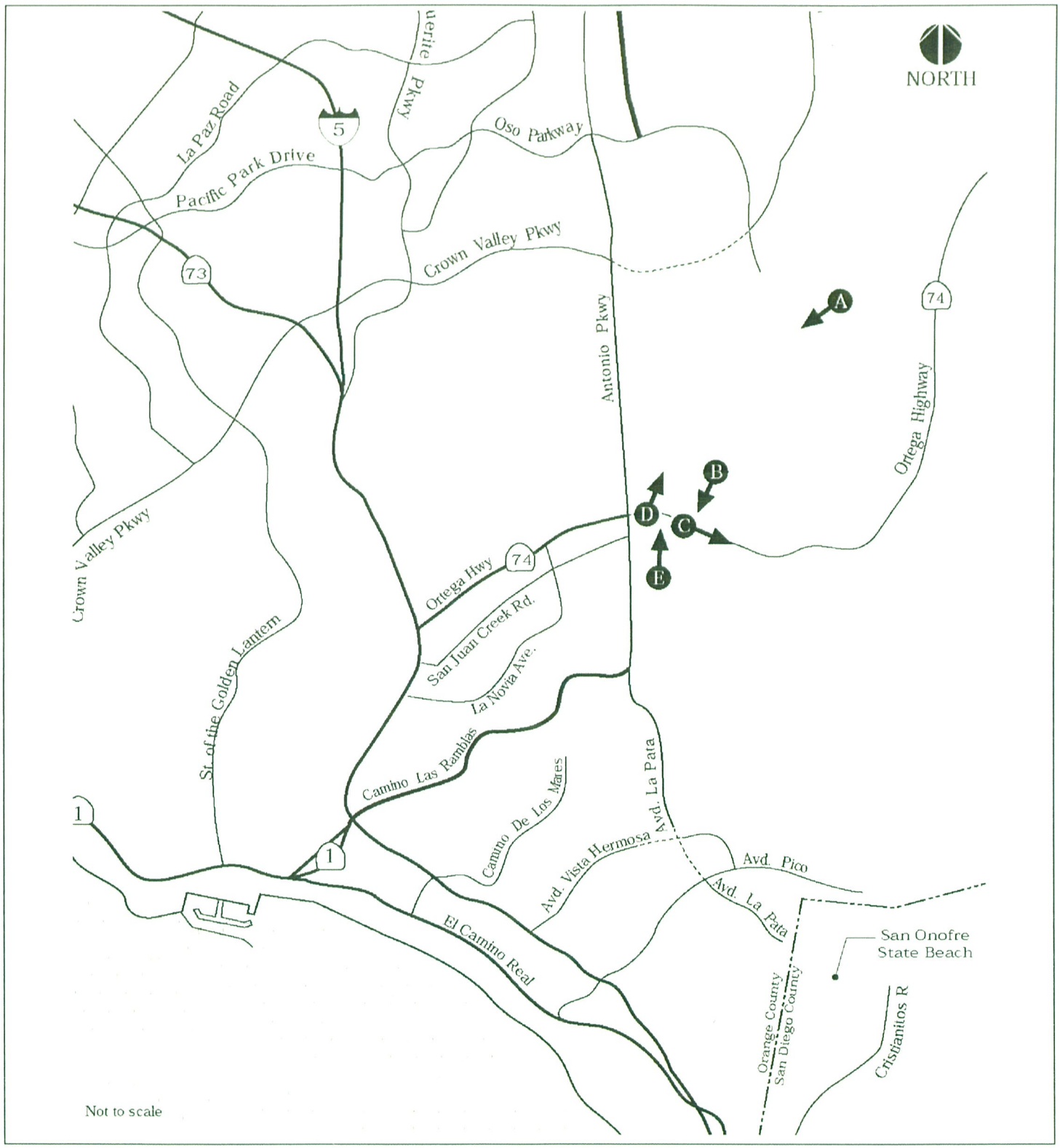


LSA

FIGURE 2.13-18

*Foothill Transportation Corridor – South*

View Point Locations of
Regionally Outstanding Views

SOURCE: P&D Consultants (2002)

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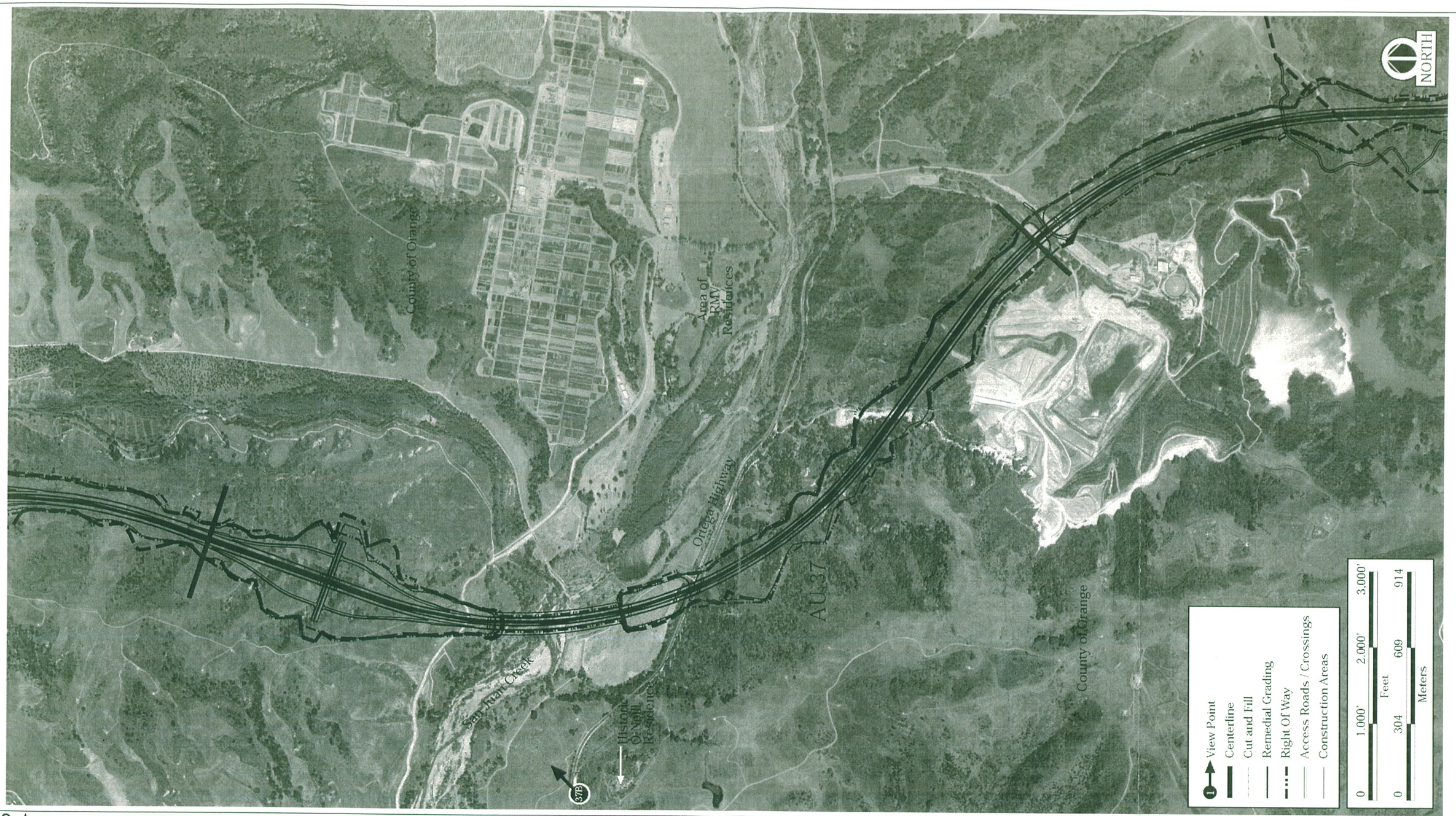


LSA

NOTE: Figure reprinted from SOCTIIP Draft EIS/SEIR

FIGURE 2.13-19

SOURCE: CDMG and P&D Consultants (2003)

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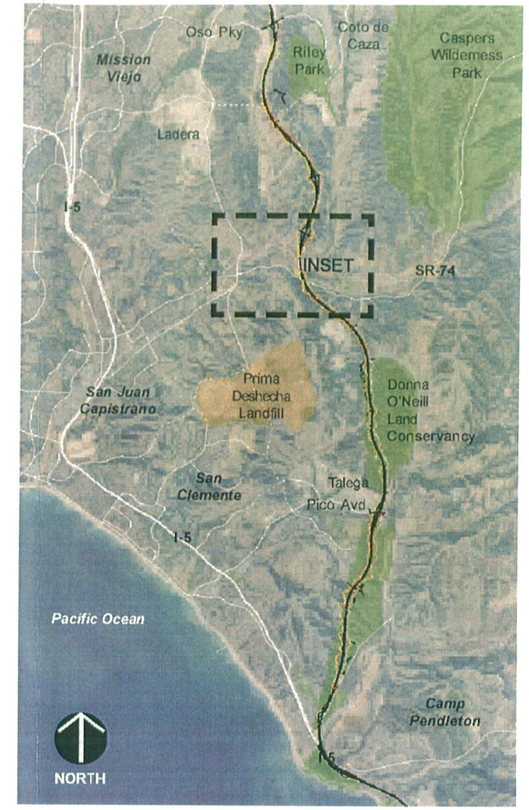
*Foothill Transportation Corridor - South*

Assessment Unit 37

*Mitigated Visual Simulation (5 Years)*

*Unmitigated Visual Simulation*

*Existing Conditions*



Approx. Scale: 1: 48,000

LSA

FIGURE 2.13-20

*Foothill Transportation Corridor – South*

Visual Simulation AU 37

Viewpoint 37a

Looking SE Along Ortega Highway Towards Overcrossing

SOURCE: Psomas 2002, 2003

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The following with project visual quality rating is provided for the mitigated project five years following completion of construction, as shown on the mitigated visual simulation. Implementation of the project alignment in AU37 would change the vividness from this view point from very high (rated 7) to high (rated 6) because the bridge across San Juan Creek and the fill north of Ortega Highway obscure part of the panoramic view beyond these features. The intactness would change from high (rated 6) to moderately high (rated 5) because of the urban appearance of the bridge. The unity of the visual components would change from very high (rated 7) to moderately high (rated 5) because of the straight lines and urban form of the project that interrupt the curvilinear pattern of the panoramic rural view and the light color of the bridge that contrasts with the predominantly green colors of the existing view. The overall visual rating of the mitigated with–project conditions from this view point would be moderately high (6 + 5 + 5 = 16, 16/3 = 5.3). This change in visual quality of 1.4 rating points would be a substantial adverse impact of the alignment in AU37 from this view point along Ortega Highway.

Viewers from the historic O'Neill residence would have views of the project features from a slightly more distant and elevated position than View Point 37A. More of the travel lanes would be visible from the residence, but the size of the road would appear smaller than from View Point 37A because the residence is farther from the project. Although the project elements would appear somewhat smaller than from View Point 37A, the visual quality impact related to views from the O'Neill residence would be substantially adverse. Because the Preferred Alternative would be limited to a maximum of six lanes, project impacts would be somewhat reduced but would remain substantially adverse.

Viewers from future residences in RMV east of the bridge across San Juan Creek would have views of this bridge and areas of fill. However, these features would be much smaller elements in the view because the RMV residences are farther from these features than is View Point 37A. The visual impacts of AU37 on views from future residences in RMV would be adverse but less than substantial.

**Visual Quality Impacts on Views of AU37 to the North from Ortega Highway (View Point 37B) and the Historic O'Neill Residence.** The with project wireframe in Figure 2.13-21 shows the area of the view that will be altered with implementation of the project. Residents of the historic O'Neill residence, south of Ortega Highway, on a knoll southeast of View Point 37B, would also have views of the project elements in Figure 2.13-21 but from a slightly higher vantage point than shown in this figure. An area of cut would be visible on the scrub-covered hill to the right of the hill in the center of the view, and travel lanes with vehicles would be visible farther to the right. The bridge would be outside of this view farther to the right.

The following with project visual quality rating is provided for the mitigated project 5 years following mitigation. Implementation of the project alignment in AU37 would not appreciably change the vividness from high (rated 6) because the cut will not change the silhouette of the hills, and the travel lanes will not obscure any vivid elements of the view. The intactness of the view would not appreciably change from very high (rated 7) because the travel lanes would be such a small part of the view. The unity of the visual components would not appreciably change from very high (rated 7) because the straight lines of the road repeat the line of the left edge of pyramid-shaped hill. The overall visual rating of the mitigated with project conditions from this

View Point 37B - Existing Conditions Photo

View Point 37B - With-Project Wireframe

LSA

FIGURE 2.13-21

*Foothill Transportation Corridor - South*

AU37 - Existing Conditions Photo and With-Project Wireframe

View Point 37B - From Ortega Highway Looking Northeast

SOURCE: KTUA, P&D Consultants and Psomas (2003)

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view point would remain the same (very high, rated 6.7). The project in AU37 would not have an adverse visual impact on views from View Point 37B and the historic O'Neill residence.

**Impacts on Regionally Outstanding Views in AU37.** AU37 is within the view scene of four regionally outstanding views. These are views B, C, D, and E, shown on Figure 2.13-17. In View B, a small part of cut will be visible in the extreme left part of the view. This impact would be adverse but less than substantial because of the small amount of the project that will be visible and because there are no sensitive viewers from this view point. The impacts related to regionally outstanding View C were described previously in this section for View Point 37A, and these impacts would be substantially adverse. The impacts related to regionally outstanding View D were described previously in this section for View Point 37B, and these impacts would not be adverse.

The fourth regionally outstanding view in the viewshed of AU37 is View E, shown on Figure 2.13-17. The alignments in AU37 north of Ortega Highway will be seen from View Point E and are shown on Figure 2.13-18. However, the project elements in this AU will be in the distance and will be a very small part of the view. Therefore, the impact of the project on this regionally outstanding view would be adverse but less than substantial.

**Impacts on Community Character in AU37.** There are no community elements or landmarks along AU37 that will be removed or altered for implementation of the project. Therefore, there will be no impacts on community elements or landmarks associated with AU37.

Ortega Highway is a County of Orange-designated viewscape corridor. The project would have a substantial adverse impact on views to the southeast from Ortega Highway in AU37, as described previously, in the area that the County has identified as scenic. Therefore, the alignment for AU37 would conflict with County policies and would result in a substantial adverse impact related to these policies. Therefore, the alignment through AU37 would conflict with County policies and would result in a substantial adverse impact related to these policies.

The alignments in AU37 would result in the removal of a substantial number of oak trees that the County recognizes as a resource, as described in Section 4.18.1. Therefore, the alignments for AU37 would conflict with County policy and would result in a substantial adverse impact related to this policy.

**Impacts Related to Light and Glare.** There will be light and glare impacts associated with the Preferred Alternative. Toll collection plazas and their lanes and ramps will be continuously lit. The mainline corridor will not be continuously lit. These new sources or new locations of light have the potential to spill onto adjacent land uses. These light and glare impacts would be substantially adverse prior to mitigation. Mitigation is described in Section 2.13.4 that will reduce these impacts to an adverse but less than substantial level.

Mitigation Measure AS-3 requires that all lighting for the Preferred Alternative be installed per the policies of the Caltrans Traffic Manual. Satisfaction of these standards would ensure that the light

impacts of the Preferred Alternative would not be substantial. Mitigation Measure AS-4 minimizes both the glare of any light source and spillover light. The vertical or horizontal illuminance from roadway lighting sources will not illuminate any surface outside of the right-of-way greater than 1/10 of the road's average horizontal illuminance. These measures will substantially reduce the potential adverse impacts of the Preferred Alternative related to substantial new sources of glare and spillover light.

**Construction Impacts Related to Visual Resources.** There will be construction-related visual impacts associated with the Preferred Alternative. Construction impacts include vegetation removal, grading, earthwork (including cuts in the terrain and placement of fill), overexcavation to address landslides and local soil conditions, and the presence of vehicles and various machinery to construct the project. These visual impacts would be adverse, but they are considered less than substantial because they are short-term during the construction phase of the project only.

The utility relocation component of the proposed project involves the replacement and/or realignment of existing infrastructure, particularly electric transmission and distribution lines. Electric distribution infrastructure typically involves easement of approximately 12 feet in width, while electric transmission infrastructure typically involves easements that are 20 feet by 100 feet or greater in width. The facilities within the easements typically consist of power poles located in the center of the easement with attachments such as guy anchors, circuit switches, stub and anchors, wires, and communication tables. Distribution facilities cover less than 1 percent of the easement area. Transmission improvements are usually larger than they are for the distribution network and cover approximately less than 5 percent of the easement area. Access to these improvements is normally provided via improved 12-foot-wide access roads.

Utility relocation in the vicinity of the I-5 interchange in the Coastal Zone will allow for the utilities to be relocated in conformance with Caltrans design standards

**Summary of Impacts Related to Visual Resources.** Table 2.13-A provides a summary of the impacts of the Preferred Alternative related to visual resources. This table identifies the short- and long-term impacts anticipated under the Preferred Alternative.

As shown in Table 2.13-A, the Preferred Alternative would result in short-term adverse visual impacts during construction and long-term increases in light and glare. The Preferred Alternative would result in reduced visual quality at 18 locations. The Preferred Alternative would result in reduced visual quality of three regionally outstanding views. The Preferred Alternative would also result in conflicts with jurisdictional visual/aesthetic policies.

## Table 2.13-A: Summary of Short- and Long-Term Visual Impacts by Assessment Unit (AU) for the Preferred Alternative

| Summary of Short- and Long-Term Impacts[1] | |
|---|---|
| **All Assessment Units** | |
| Light and Glare | Increased light and glare in all assessment units. Substantially adverse. The Preferred Alternative does not increase the severity of the impact or result in a new significant impact related to light and glare. |
| Construction | Short-term reduction in visual quality due to vegetation removal, grading, cut/fill, and presence of vehicles, machinery, and construction materials. Adverse for sensitive viewers. However, these impacts are considered adverse but less than substantial because they are short-term during the construction phase of the project only. |
| **AU1-5** | |
| Visual Quality | Reduction in visual quality for motorists (sensitive viewers) on Oso Parkway. Adverse but less than substantial. |
| | Reduction in visual quality for viewers from Ladera Ranch Land Conservancy. Adverse but less than substantial. |
| | Reduction in visual quality for nonsensitive viewers. Adverse but less than substantial. |
| View Quality | No impact on regionally outstanding views. |
| Community Character | No impact. |
| **AU36** | |
| Visual Quality | Reduction in visual quality for residents (sensitive viewers) in Coto de Caza. Not adverse. |
| | Minor reduction in visual quality for users of Caspers Park (sensitive viewers). Not adverse. |
| | Minor reduction in visual quality for users of Riley Park (sensitive viewers). Not adverse. |
| | Reduction in visual quality for nonsensitive viewers. Adverse but less than substantial. |
| View Quality | Minor reduction in view quality of the regionally outstanding view from Caspers Park. Not adverse. |
| | Reduction in view quality of regionally outstanding view E, south of Ortega Highway. Adverse but less than substantial. |
| Community Character | No impact. |
| **AU37** | |
| Visual Quality | Reduction in visual quality for motorists (sensitive viewers) on Ortega Highway. Substantially adverse. |
| | Reduction in visual quality for residents in RMV. Adverse but less than substantial. |
| | Reduction in visual quality of views from the historic O'Neill residence. Substantially adverse. |
| | Reduction in visual quality for nonsensitive viewers. Adverse but less than substantial. |
| | Reduction in view quality of regionally outstanding view C from Ortega Highway. Substantially adverse. |
| | Minor reduction in view quality of regional outstanding view D from Ortega Highway. Not adverse. |

| Summary of Short- and Long-Term Impacts[1] | |
|---|---|
| | Reduction in view quality of regionally outstanding view B, from north of Ortega Highway, and regionally outstanding view E, from south of Ortega Highway. Adverse but less than substantial. |
| Community Character | Conflict with County of Orange policies regarding scenic highways. Substantially adverse. |
| | Conflict with policies of the County of Orange related to oak trees. Substantially adverse. |
| **AU31-2** | |
| Visual Quality | Reduction in visual quality for visitors to The Donna O'Neill Land Conservancy (sensitive viewers). Substantially adverse. |
| | Reduction in visual quality for nonsensitive viewers. Adverse but less than substantial. |
| View Quality | No impact on regionally outstanding views. |
| Community Character | No impact. |
| | Conflict with policies of the County of Orange related to oak trees. Substantially adverse. |
| | Conflict with policies of The Donna O'Neill Land Conservancy regarding the preservation of scenic resources. Substantially adverse. |
| **AU32** | |
| Visual Quality | Reduction in visual quality for residents (sensitive viewers) on the east part of the Talega PC. Adverse but less than substantial. |
| | Reduction in visual quality for residents adjacent to a sound wall on the east edge of the Talega PC. Substantially adverse. |
| | Reduction in visual quality for nonsensitive viewers. Adverse but less than substantial. |
| View Quality | No impact on regionally outstanding views. |
| Community Character | No impact. |
| **AU33** | |
| Visual Quality | Reduction in visual quality for users of San Onofre State Beach, Cristianitos Subunit (sensitive viewers), especially viewers from San Mateo Campground. Substantially adverse. |
| | Reduction in visual quality for residents (sensitive viewers) in the San Onofre 1 Housing of Camp Pendleton. Adverse but less than substantial. |
| | Reduction in visual quality from marine training areas. No adverse impact on ability of MCB Camp Pendleton to train marines. |
| | Reduction in visual quality from ocean and land view points for users of San Onofre State Beach, Trestles and Cristianitos Subunits (sensitive viewers). Adverse but less than substantial. |
| | Reduction in visual quality for residents (sensitive viewers) of San Mateo Point Housing of Camp Pendleton. Substantially adverse. |
| | Reduction in visual quality for nonsensitive viewers. Adverse but less than substantial. |
| View Quality | No impact on regionally outstanding views. |
| Community Character | Conflict with policies of San Onofre State Beach regarding blockage of views of the ocean. Substantially adverse. |
| | Conflict with policies of the County of San Diego related to scenic highways. Substantially adverse. |

Source: P&D Consultants (2003).
[1] Construction impacts are short-term and all other impacts are long-term.

## Impacts in Coastal Zone

AU33, discussed in detail above, is within the Coastal Zone. There are several views in the Coastal Zone that are altered, but the change is not substantially adverse. The views that are not substantially impaired included the following:

- San Onofre 1 military housing area on MCB Camp Pendleton
- SOSB trail looking northeast
- Upper Trestles surfing area looking northeast
- Upper Trestles looking toward Basilone Road
- SOSB looking east toward Basilone Road

There are several views that are substantively affected with implementation of the Preferred Alternative. These include views from San Mateo Campground and the residents of San Mateo Point military housing on MCB Camp Pendleton. Although a portion of the SOSB leasehold is within the Coastal Zone, the San Mateo Campground is not within the Coastal Zone.

In addition, changes to views from Cristianitos Road and I-5 are inconsistent with adopted policies. However, these views are located on MCB Camp Pendleton, and federal land is not subject to local and State policies.

### Views That Are Not Substantially Impaired.

**Views from San Onofre 1 Housing Area.** Residents in the southern portion of the San Onofre housing unit will have closer views of the connector ramps along with the existing views of I-5. The connector ramps will be below the elevation of the housing area and will not obstruct vegetation and slopes. Therefore, the visual quality impacts to viewers in the San Onofre 1 housing will not be adverse.

**Views from SOSB Trail near Trestles Beach (Viewpoint 33D).** Figure 2.13-10 shows the existing conditions photo and visual simulation of the project in the view from the SOSB trail west of I-5 looking northeast toward I-5. This view would be experienced by surfers and other beach users returning from the beach and looking northwest toward I-5 and the San Mateo Creek bridge structure.

The landform is relatively flat, and clusters of trees and shrubs surrounded by grasses and other low vegetation line both sides of the paved trail that leads under I-5. The elevated structure of I-5 is visible low on the horizon in the distance.

I-5 currently provides a straight-edged feature in this view. The Preferred Alternative connector ramps to I-5 introduce a second straight-edged feature into this view. The connector ramps are visible but below the tops of the trees that screen part of the structure in the view. There is no project mitigation that would be visible in this view; therefore, the unmitigated and mitigated visual simulations are the same.

The existing vegetation will continue to mature and is expected to provide additional screening of the proposed connector ramps over time. Implementation of the project will change a small portion of the view; however, none of the existing landscape elements would be removed or changed. The addition of the straight line of the elevated structure above the existing I-5 will not substantially interrupt the existing visual pattern of the view, and the change in visual quality is slightly adverse.

**Views from Upper Trestles Surfing Area (33E).** Figure 2.13-11 shows the existing conditions photo and visual simulation of the project from the Upper Trestles surfing area of the Pacific Ocean looking northeast toward the beach and San Mateo Creek. The following are major landscape components:

- The ocean in the foreground
- The beach
- Bluffs on the right and left of the view
- A horizontal band of vegetation beyond the beach
- The line of hills in the far distance
- The sky, which is a major element of this view

The existing landscape components are largely linear in nature due to the narrow horizontal band of land between the water and sky. No project mitigation would be visible in this view; therefore, the unmitigated and mitigated visual simulations are the same. The elevated connector ramp is visible between the bluffs on the right and left of the view and is below the tops of hills and above the line of vegetation in the center of the view.

Implementation of the Preferred Alternative will change a small portion of the view; however, none of the existing landscape elements will be removed or changed. The Preferred Alternative adds a visual component but does not change the overall character of the view and is not out of scale with the existing topography and vegetation. The ramp will not be visible above the horizon line. Therefore, the project will not substantially interrupt the existing visual pattern of the view. The change in visual quality is slightly adverse.

**Upper Trestles Looking toward Basilone Road (33G).** Figure 2.13-12 shows the existing conditions photo and visual simulation of the project from the Upper Trestles surfing area of the Pacific Ocean looking northeast toward Basilone Road. The major landscape components are similar to the view described above, and there is no project mitigation that would be visible in this view. Therefore, the unmitigated and mitigated visual simulations are the same. The elevated connector ramp is visible.

Implementation of the Preferred Alternative will change a small portion of the view; however, none of the existing landscape elements will be removed or changed. The Preferred Alternative adds a visual component but does not change the overall character of the view and is not out of

scale with the existing topography and vegetation. The ramp will not be visible above the horizon line, and very little of the hills in the background will be concealed by the ramp. Therefore, the project will not substantially interrupt the existing visual pattern of the view, and the change in visual quality is considered slightly adverse.

**Views from SOSB Looking East toward Basilone Road (33F).** Figure 2.13-13 shows the existing conditions photo and visual simulation of the project from SOSB looking east toward Basilone Road. The view is composed of grasslands in the foreground and is bordered by a band of shrubs and trees. The southern portion of the San Onofre 1 housing unit on MCB Camp Pendleton is visible above the trees, and a hill is behind it. Grassland covers the largest area of the view.

There is no project mitigation that would be visible in this view; therefore, the unmitigated and mitigated visual simulations are the same. The elevated connector ramp is visible below the housing on the left side of the view. The color and engineered line of the concrete connector contrasts with the other view components.

Implementation of the Preferred Alternative will change a small portion of the view; however, none of the existing landscape elements will be removed or changed. The Preferred Alternative adds a visual component but does not change the overall character of the view and is not out of scale with the existing topography and vegetation. The ramp will not be visible above the horizon line. Therefore, the project will not substantially interrupt the existing visual pattern of the view. The change in visual quality is slightly adverse.

**Reduced Visual Quality.** Implementation of the Preferred Alternative would result in a reduction in visual quality for users of SOSB and San Mateo Campground and the residents of San Mateo Point housing on MCB Camp Pendleton.

**Reduction in Visual Quality for Users of SOSB, Cristianitos Subunit, including Viewers from San Mateo Campground.** The view will change because the project sound wall will become a dominant feature of the view (Figure 2.13-14). The view will also change due to the road embankment's proximity to the campground, thus becoming a prominent feature in the view instead of the hill. In addition, the retaining wall and guardrail will contribute urban features to the view, which is currently largely undeveloped. The character of the visual elements will also change because the plane of the fill slopes, the straight lines of the edge of the retaining wall, and the edge of the toll road surface will substantially interrupt the existing curvilinear patterns of the view. The overall change would be an adverse impact on the viewers in SOSB and, particularly, in the San Mateo Campground. However, these changes, while adverse, will not impair the continued operation and use of SOSB as a park and campground.

**San Mateo Point Housing of MCB Camp Pendleton.** In AU33, implementation of the Preferred Alternative will result in the reduction in visual quality for residents of the San Mateo Point housing on MCB Camp Pendleton. The sound wall in this area will obscure all of the

existing view behind it except for the crest of the ridge in the background, and the sound wall will become the dominant feature in the view. The vividness and intactness of the existing view will change from moderate to low with the introduction of the sound wall. The pattern of hills and ridges behind I-5 will be eliminated from the view.

Figure 2.13-15 (33H) shows the existing conditions photo and visual simulation of the project looking southeast from the San Mateo Point housing area. The view is composed of the outdoor common area and play area in the foreground, with landscaping and a low block wall that separates the community from I-5. A center guardrail and cars on I-5 are visible behind the block wall. The San Onofre 1 housing area is on a bluff on the east side of I-5 and is framed by mountains in the background.

A sound wall (project mitigation) would be visible in this view. The unmitigated visual simulation shows the area of the view that will be altered with implementation of the project but without the sound wall. As shown in the mitigated visual simulation, the sound wall will obscure all of the existing view behind it except for the crest of the ridge in the background, and the sound wall will become the dominant feature of the view. Residents of San Mateo Point housing would see a segment of the connector ramp that would start to be visible farther to the right of the view, as shown in the visual simulation.

Implementation of the Preferred Alternative will change the view from the San Mateo Point housing area. The view of the hills and ridges behind I-5 will be eliminated, reducing the visual quality of the view. Impacts to views from San Mateo Point housing will be adverse and substantial in the area where the sound wall is visible.

**Other Visual Effects.** Other visual effects pertaining to the Coastal Zone are effects on views of the ocean from Cristianitos Road relative to the SOSB policies and an inconsistency with the County of San Diego designation of I-5 as a Scenic Route. These views are located on MCB Camp Pendleton, and federal land is not subject to local or State policies. Also, Congress has adopted legislation authorizing the DON to grant to the TCA an easement within this portion of MCB Camp Pendleton.

**Views of the Ocean from Cristianitos Road.** Implementation of the Preferred Alternative would result in conflicts with policies of SOSB regarding blockage of views of the ocean. The SOSB General Plan identifies scenic resources, including geomorphic features and vegetation, to be of great importance, and it is SOSB policy to protect these resources. Constructing the Preferred Alternative involves the removal of vegetation and the cut-and-fill alterations of the landform within the inland portion of SOSB. Once built, partial view blockages would occur for westbound drivers on Cristianitos Road in SOSB. This existing road does not presently connect as a through road, and users of the road are generally only users of the SOSB. This will remain the case after the Preferred Alternative is built. Thus, there is a limited group of users on Cristianitos Road. The Preferred SOCTIIP Alternative is not subject to the SOSB General Plan because the property is owned by the federal government, and the conditions of the lease agreement and federal legislation described above provide for implementation of the SR-241 Extension.

**Scenic Highway Designation.** Implementation of the Preferred Alternative conflicts with policies of the County of San Diego related to scenic highways. The County of San Diego has designated I-5 from the City of Oceanside city limits north to the Orange County border as a Scenic Route and identifies any physical change that will substantially affect the viewshed of a designated scenic highway to be a significant visual effect. Implementation of the connector ramps that cross I-5 will introduce long, elevated structures to the views of the densely vegetated San Mateo Creek area and the agricultural fields north of I-5. The connector ramps will be in the foreground view of motorists and would substantially change the viewshed to the northeast. The southern part of the connector ramps will also change ocean views for motorists on I-5. But the project adds elements to the existing I-5 and various ramps, so these additions will slightly expand the existing transportation facilities in the area. Therefore, implementation of the project along the southern portion of AU33 would have a substantial adverse impact related to adopted policies and plans of San Diego County. The Preferred Alternative is not subject to the County of San Diego General Plan because the property is owned by the federal government, and the conditions of the lease agreement and federal legislation described above provide for implementation of the SR-241 Extension.

**Visual Benefits.** The Preferred Alternative will create new views of the ocean and coastal resources. The Preferred Alternative includes an elevated southbound connector from SR-241 to I-5. Vehicles traveling on southbound SR-241 will experience sweeping views of the coast. The proposed extension of SR-241 will provide new, publicly accessible views of the coast. In addition, because of the congestion relief provided, the project permits recreational users to enjoy coastal views.

**Impacts Related to Light and Glare.** There will be light and glare impacts associated with the Preferred Alternative within the Coastal Zone. As discussed previously, new sources or new locations of light have the potential to spill onto adjacent land uses. These light and glare impacts would be substantially adverse prior to mitigation. Mitigation is described in Section 2.13.4 that will reduce these impacts to an adverse but less than substantial level.

**Construction Impacts Related to Visual Resources.** There will be construction-related visual impacts associated with the Preferred Alternative within the Coastal Zone. Construction impacts include vegetation removal, grading, earthwork (including cuts in the terrain and placement of fill), overexcavation to address landslides and local soil conditions, and the presence of vehicles and various machinery to construct the project. These visual impacts would be adverse, but they are considered less than substantial because they are short-term during the construction phase of the project only.

**Summary of Impacts within the Coastal Zone.** Table 2.13-B summarizes the impacts of the Preferred Alterative within AU33, which is within the Coastal Zone.

**Table 2.13-B: Summary of Short- and Long-Term Visual Impacts for Assessment Unit 33 for the Coastal Zone of the Preferred Alternative**

| | Summary of Short- and Long-Term Impacts[1] |
|---|---|
| Light and Glare | Increased light and glare in all assessment units. Substantially adverse. The Preferred Alternative does not increase the severity of the impact or result in a new significant impact related to light and glare. |
| Construction | Short-term reduction in visual quality due to vegetation removal, grading, cut/fill, and presence of vehicles, machinery, and construction materials. Adverse for sensitive viewers. However, these impacts are considered adverse but less than substantial because they are short-term during the construction phase of the project only. |
| Visual Quality | Reduction in visual quality for users of San Onofre State Beach, Cristianitos Subunit (sensitive viewers), especially viewers from San Mateo Campground. Substantially adverse. |
| | Reduction in visual quality for residents (sensitive viewers) in the San Onofre 1 Housing of Camp Pendleton. Adverse but less than substantial. |
| | Reduction in visual quality from marine training areas. No adverse impact on ability of MCB Camp Pendleton to train marines. |
| | Reduction in visual quality from ocean and land view points for users of San Onofre State Beach, Trestles, and Cristianitos Subunits (sensitive viewers). Adverse but less than substantial. |
| | Reduction in visual quality for residents (sensitive viewers) of San Mateo Point Housing of Camp Pendleton. Substantially adverse. |
| | Reduction in visual quality for nonsensitive viewers. Adverse but less than substantial. |
| View Quality | No impact on regionally outstanding views. |
| Community Character | Conflict with policies of San Onofre State Beach regarding blockage of views of the ocean. Substantially adverse. |
| | Conflict with policies of the County of San Diego related to scenic highways. Substantially adverse. |

Source: P&D Consultants (2003).
[1] Construction impacts are short-term and all other impacts are long-term.

The Proposed Project includes project design features (PDFs) and mitigation measures to reduce the adverse impacts summarized in Table 2.13-B to sensitive viewers in the Coastal Zone. PDFs include guidelines for the retaining walls and landscaping requirements, including design components and plant materials intended to reduce the visual impacts of the Preferred Alternative on adjacent sensitive uses.

## 2.13.4 MITIGATION

The following mitigation measures were developed to minimize as much as possible the adverse impacts of the Preferred Alternative related to visual resources and are applicable to impacts in the Coastal Zone. These mitigation measures are for long-term visual impacts. No mitigation measures are necessary for short-term visual impacts. In addition to the mitigation listed below, Project Design Features (PDFs) 18-1 and 18-2 establish lighting and landscaping guidance for the project.

**PDF-18-1** **Lighting for the Corridor Alternatives.** The corridor Alternatives will include pole-mounted lighting at the toll plazas, ramps, and other locations as required by Caltrans standards. Lighting in areas away from the toll plazas, ramps, and other locations as required by Caltrans standards will be minimized to avoid unnecessary light effects in more rural areas adjacent to the corridor. In addition, all lighting along the corridors will be shielded and directed to focus the light on the corridor and its facilities to minimize light leakage outside the corridor limits.

**PDF-18-2** **Landscaping for the Corridor.** The corridor Alternatives will include landscaping for unpaved areas within the corridor rights-of-way. Landscaping will focus on native plant species, particularly in areas adjacent to undeveloped land with native plant species. In addition, the landscaping will include design components and plant materials intended to reduce the visual impacts of the corridor alternatives on adjacent sensitive uses. Section 4.18 (Affected Environment, Impacts and Mitigation Measures Related to Visual Resources) provides additional discussion of the use of native plant materials and other landscaping to soften views of the corridor.

**AS-1** Adjacent landforms affected by the build Alternatives shall be recontoured to a 2:1 slope or as determined appropriate through geotechnical investigation to provide a smooth and gradual transition between modified landforms and existing grade and to minimize the appearance of manufactured grading. Use of crib-type retaining walls in place of slopes shall be minimized, except where necessary to provide greater landform diversity, reduce fill slopes, minimize long, flat slope surfaces, or potentially salvage rock outcroppings. In areas where sensitive habitat is not prevalent, the top and toe of the slope edges shall be rounded to reduce the angular effects of manufactured grading. The top of slopes where the surface breaks the horizon or ridgeline shall be undulated to avoid a straight edge along the skyline. For slopes greater than 20 m (65.6 feet), terrace drains shall be used to break up slope surfaces.

The TCA or the implementing agency/agencies shall prepare Aesthetic Design Guidelines for the project, similar to the guidelines for the San Joaquin Hills Transportation Corridor and the Foothill/Eastern Transportation Corridor. It is not possible to provide these guidelines at this stage of the project. The guidelines will be developed during final design of the Preferred Alternative. The Design Guidelines shall specifically address grading, berm design, slopes, benches, and the incorporation of sound and retaining walls. These Guidelines will be used in conjunction with the Landscape Design Guidelines described in Mitigation Measure AS-2 to minimize the visual impacts of the build Alternatives.

**AS-2** The TCA or the implementing agency/agencies shall prepare Landscape Design Guidelines that will specify plant species that will either be seeded or planted on all exposed areas such that these areas will blend with the surrounding vegetated areas. Native vegetation shall be placed in appropriate locations and densities to fit into the natural setting. Landscaping with varied height and species diversity shall be used and material selection, location of native plant materials, and sculptured grading shall emulate the adjacent natural setting. Terrace drains shall be screened with periodic

placement of native plant materials in a random manner to help blend these drainage facilities into the slope and not unintentionally emphasize these facilities. The Landscape Design Guidelines will include the locations of the shrubs and/or vining species, where appropriate, at the base of sound walls to blend these structures as much as possible with the surrounding areas. All landscaping treatments and materials shall be consistent with the Landscape Design Guidelines.

**AS-3** Lighting per Caltrans policies and procedures as set forth in the Caltrans Traffic Manual shall be installed by the TCA or implementing agency or agencies along the corridor or I-5 if one of these build Alternatives is selected. Lighting shall be such that Partial Interchange Lighting (PIL) with two electroliers at each interchange ramp, positioned per Caltrans standards, is provided. Additional and/or supplemental lighting shall be provided where necessary for safety. Toll collection plazas and their adjacent roadways shall be continuously lit. The mainline corridor shall not be continuously lit.

Lighting per County of Orange or local jurisdiction standards shall be installed along the arterials under the AIO Alternative by the implementing agency/agencies. *(This portion of the mitigation measure is not applicable to the Preferred Alternative)*

**AS-4** In conjunction with operation of the corridor Alternatives, light shall be applied as effectively as possible by the TCA, minimizing both the glare of any light source and the spillover of light onto areas outside of the corridor right-of-way . The vertical or horizontal illuminance from roadway lighting sources shall not illuminate any surface outside of the right-of-way greater than 1/10 of the road's average horizontal illuminance. On the segment of a build Alternative through The Conservancy, there shall be no illumination of any surface in The Conservancy outside the right-of-way of the SOCTIIP Alternative.

In conjunction with operation of the AIO and I-5 Alternatives, light shall be applied as effectively as possible by the implementing agency/agencies, minimizing both the glare of any light source and the spillover of light onto areas outside of the road right-of-way. *(This portion of the mitigation measure is not applicable to the Preferred Alternative)*

## 2.13.5 CONCLUSION

The Preferred Alternative will have adverse impacts on key views that will remain significant after mitigation. However, the Preferred Alternative does not substantially alter key coastal views.

# 2.14 ENERGY

## 2.14.1 INTRODUCTION

This section provides a summary of transportation-related energy consumption in the study area for the Preferred Alternative. Energy consumption and vehicle miles traveled (VMT) are addressed in Section 4.19 of the Final SEIR.

Direct energy consumption involves energy used in the operation of vehicles. In assessing the direct energy impact of the SOCTIIP Alternatives, the following factors were considered:

- Vehicle mix, including passenger vehicles, heavy trucks, and transit buses
- Annual vehicle miles traveled (VMT)
- Variation of fuel consumption rates by vehicle type

Assumptions were made regarding vehicle mix used by mode type. Passenger vehicles were assumed to account for 88 percent of vehicles on the road, heavy trucks for 10 percent, and transit buses for 2 percent.

The long-term energy analysis for each alternative was based on 2025 corridor traffic volumes and systemwide total VMT. The 2025 daily traffic volumes for the study corridor were obtained from the South Orange County Transportation Infrastructure Improvement Project Traffic and Circulation Technical Report (Austin-Foust Associates, Inc. 2003). The daily VMT was annualized using a factor of 335 days per year. The VMT Fuel Consumption Method used for this analysis is described in the Energy and Transportation Systems Manual (Caltrans 1983). Energy consumption factors were developed by Oak Ridge Laboratory and published in the 1996 Transportation Energy Book: Edition 16.

The analysis in the Final SEIR describes the daily VMT differences for the build Alternative analysis scenarios compared to the 2025 No Action Alternative analysis scenarios. Consumption is addressed under two future development scenarios: (1) with development in the study area consistent with the projections in Orange County Projections-2000 (OCP-2000, Center for Demographic Research, Orange County Projections-2000); and (2) with development of the RMV property with approximately 14,000 dwelling units.[1]

In the energy analysis, potential energy consumption is measured in British Thermal Units (BTUs). One BTU is the quality of energy necessary to raise 1 pound of water 1 degree Fahrenheit at 1 atmosphere of pressure. BTUs were converted to the equivalent barrels (bbl) of crude oil and liters for comparison of the alternatives, as follows:

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[1] An RMV development scenario assuming 21,000 dwelling units was also examined, however, the RMV Ranch Plan since approved allows up to 14,000 units; therefore, the 21,000 dwelling unit scenario is not applicable.

- 5.8 quadrillion BTU/year = 1 billion bbl/year crude oil
- 1 bbl = 158.97 liter (1 liter = 00.629 bbl)

## 2.14.2 SETTING

### Study Area Setting

The study area for the Preferred Alternative consists of the Cities of Mission Viejo, San Juan Capistrano, and San Clemente; parts of the Cities of Rancho Santa Margarita, Laguna Hills, Laguna Niguel, and Dana Point; and the unincorporated part of Orange County from Rancho Santa Margarita to San Clemente, which encompasses the established communities of Las Flores, Ladera, and Talega and the RMV area. Energy is currently consumed in the study area for the construction of public and private projects, for the operation of automobiles and trucks, and for operation of existing land uses.

### Coastal Zone Setting

The Coastal Zone area within the broader project study area consists of the southern portion of the City of San Clemente and the northern portion of the Marine Corps Base (MCB) Camp Pendleton.

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements being required by the Marine Corps. The new gate area facility will include six sentry houses, a 510-square-foot gatehouse, a truck inspection area with canopy, a watch tower, control gates, and a parking area. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.14.3 IMPACTS

### Project Impacts

**Construction Impacts Related to Energy.** Construction energy effects are indirect effects that involve the one-time nonrecoverable energy use associated with construction of the road, structures, and materials for the Preferred Alternative. Construction energy effects also include energy associated with implementation of the utility modifications proposed as part of the project. The use of energy for the construction of the Preferred Alternative would be a short-term adverse impact on energy resources. However, it would represent only a minor percent of the total energy consumed in the

region during the construction period and, therefore, is not anticipated to result in adverse impacts on the overall supply of and demand for energy during construction of the Preferred Alternative.

**Long-Term Impacts Related to Energy.** Potential energy consumption is measured in BTUs, bbl of crude oil, and liters.

**Preferred Alternative-RMV Plan.** Under the Preferred Alternative with the RMV Plan, the 2025 VMT for passenger vehicles, heavy trucks, and buses are projected to be 141.281 billion miles. Vehicles operating in the circulation system study area are anticipated to expend approximately 1,204,113 billion BTUs or 33.006 billion liters (207.606 million barrels) of oil. As a result, the Preferred Alternative with the RMV Plan would result in an increase of energy consumption compared to the No Action Alternative with the RMV Plan. On an annual basis, this Alternative would consume approximately 60 billion BTUs or 11,000 barrels of crude oil (2 million liters) more than the No Action Alternative-RMV Plan. Although this Alternative would result in an increase in energy consumption compared to the No Action Alternative, the change in consumption would amount to less than 1 percent (0.00498 percent). Therefore, this Alternative would not result in a substantial change in energy consumed on an annual basis.

**Preferred Alternative-OCP-2000.** Under the Preferred Alternative and assuming OCP-2000 development levels, the 2025 VMT for passenger vehicles, heavy trucks, and buses are projected to be 141.463 billion miles. Vehicles operating in the circulation system study area are anticipated to expend approximately 1,205,639 billion BTUs or 33.047 billion liters (207.869 million barrels) of oil. As a result, the Preferred Alternative with OCP-2000 would result in an increase of energy consumption compared to the No Action Alternative with OCP-2000. On an annual basis, this Alternative would consume approximately 50 billion BTUs or 9,000 barrels of crude oil (1 million liters) more than the No Action Alternative-OCP-2000. Although this Alternative would result in an increase in energy consumption compared to the No Action Alternative, the change in consumption would amount to less than 1 percent (0.00414 percent). Therefore, the Alternative would not result in a substantial change in energy consumed on an annual basis.

The Preferred Alternative is limited to six lanes rather than the eight-lane facility evaluated in the Draft EIS/SEIR for the "ultimate" facility. Therefore, the impacts described above may be somewhat overstated.

**Summary of Impacts Related to Energy.** Transportation projects such as the Preferred Alternative increase capacity and provide additional travel choices. Generally, increasing capacity and providing additional links in the transportation system have a beneficial impact as the travel speed increases. VMT may be reduced due to a more direct travel route or, conversely, may increase as some links may result in a longer travel distance but result in fewer vehicle hours traveled (VHT).

The Preferred Alternative would result in a very small increase to VMT and energy consumption compared to the No Action Alternative and assuming the same number of dus on RMV.

The Preferred Alternative scenario that assumes implementation of the RMV Plan generates less demand for energy (decreased VMT and barrels and liters of oil consumed) compared with the Preferred Alternative scenario that assumes OCP-2000. This is primarily due to the fewer number of dus proposed under the RMV Plan (14,000 vs. 21,000 dus), which results in fewer VMT on the circulation system.

The proposed project will result in vehicles using the facility and reducing use of I-5 and arterial roadways. While this will cause a very slight increase in VMT, there is a corresponding decrease in congestion and in vehicle hours traveled. Therefore, the SR-241 Extension would not result in a substantial change in energy consumed on an annual basis.

### Impacts in Coastal Zone

The proposed project, the extension of SR-241, will increase regional transportation capacity. Therefore, the Proposed Project is expected to yield increased regional transportation efficiency in terms of vehicle hours traveled and energy use. The extension of SR-241 provides improved regional access to coastal areas and may contribute to a reduction in VMT associated with access and use of recreation resources in the Coastal Zone.

## 2.14.4 MITIGATION

No mitigation measures related to energy are proposed because the change in energy consumption under the Preferred Alternative compared to the No Action Alternatives is substantially less than 1 percent on an annual basis; therefore, construction and operation of the Preferred Alternative would not result in adverse impacts on energy consumption.

## 2.14.5 CONCLUSION

The Final SEIR concluded that potential impacts to energy resources are less than significant. No mitigation measures are required.

# 2.15 EARTH RESOURCES

## 2.15.1 INTRODUCTION

The potential impacts of the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) Alternatives on earth resources are evaluated in detail in the Geotechnical, Geology and Soils Technical Report (GeoPentech, Inc., 2003). This section summarizes some of the information contained in this document primarily as it relates to the Preferred Alternative as well as the portion of the Preferred Alternative in the Coastal Zone. Earth Resources are addressed in Section 4.20 of the Final SEIR.

## 2.15.2 SETTING

### Study Area Setting

**Regional Geologic and Seismic Setting.** The Preferred Alternative alignment trends generally north to northwest across the foothills of the Santa Ana and Santa Margarita Mountains. These mountains are in the Peninsular Ranges Physiographic Province of California, which is characterized by its generally northwest-trending mountains and geologic structure. This Province is bounded on the north by the Transverse Ranges Province, which is characterized by its east-west geologic structural and topographic grain and on the east by the Colorado and Mojave Desert Provinces.

The most complete section of late Mesozoic and Cenozoic geologic units in the north part of the Peninsular Ranges Province is exposed in the foothills and valleys of the Santa Ana and Santa Margarita Mountains. These units are divided into surficial units and bedrock formations. The surficial units are generally composed of poorly to moderately consolidated sediments of Pleistocene and Holocene age and generally occur in valley bottoms or thinly mantle the hillsides. The surficial units include landslide deposits within the bedrock units and manmade fills. The bedrock units consist of a series of clastic sedimentary rocks of Upper Cretaceous to Tertiary geologic age. Along the Preferred Alternative, they are primarily composed of marine and nonmarine sandstones and siltstones that form a blanket that thickens to the south and west with a thickness estimated to be as much as 7,500 meters (m) (24,600 feet [ft]). Below the sedimentary bedrock units, and not exposed along the Preferred Alternative, are the basement or subjacent series rocks of Middle to Upper Jurassic geologic age. These rocks form much of the core of the Santa Ana Mountains and consist of crystalline and metamorphic rocks that are unconformably overlain by the sedimentary bedrock units.

### Principal Surficial Units.

**Manmade Fills.** Deposits of artificial (manmade) fill occur locally along the Preferred Alternative. The majority of these deposits occur in more developed sections of the project, such as along the I-5. In most cases, these fills were likely derived from nearby geologic units and thus, would be similar in lithology. However, wide variability in material type can occur in manmade fills because of variability in the source materials (i.e., varied bedrock and alluvial

units) and because of variations in the way the fills were placed. Important factors associated with manmade fills include the degree to which the area beneath the fill was prepared before fill placement and the degree to which the fill material was compacted. Depending on site-specific conditions, nonengineered manmade fill may need to be removed as part of the grading for the Preferred Alternative.

**Landslide Deposits.** There are areas of small to very large landslide deposits within the sedimentary bedrock units that occur along the Preferred Alternative. Certain bedrock units are more prone to landsliding than others. For example, relatively few landslides are mapped in the Santiago Formation, whereas landslides are very common in the Monterey and Capistrano Formations.

The lithology of landslide materials is dependent on the bedrock source and tends to be clayey silt to silty sand. Because these masses have moved, they may be more porous and lower in density than the intact bedrock. These masses are prone to continued downslope movement during or after periods of substantial rainfall. However, some landslide masses may be relatively stable in their current configurations. Although perhaps otherwise stable, renewed downhill movement of a landslide mass can result if grading removes support at the base of the landslide mass or adds weight near the top of a landslide mass. In many cases, landslide deposits would not be suitable for the support of embankments and road improvements. Therefore, these types of materials are commonly avoided, or completely removed to depths below the slide plane that moved, and then replaced as compacted fill during grading for a project.

**Colluvium.** Colluvial deposits are formed by in-place weathering of bedrock units or by downslope creep and slumping of weathered material and are not deposited by streams. Colluvium is locally present along the Preferred Alternative, specifically in landslide head scarp areas, on gentle slopes, and over formations and units that are more susceptible to in-place weathering. Colluvial deposits are derived from the underlying or locally adjacent bedrock, and therefore, are of varying composition, reflecting the lithology of the parent material. In general, colluvial materials are clay-rich and contain varying amounts of organic material. These materials are typically unconsolidated and uncemented, low in density, lack structure, and are poorly sorted to unsorted. Substantial amounts of unweathered or partially weathered parent bedrock may be present as clasts within the colluvium.

**Alluvium.** Alluvium is present in the bottoms of all the major drainages and many of the minor drainages crossed by the Preferred Alternative. Alluvium is typically fine- to very coarse-grained sand and gravel, with varying amounts of silt and/or clay. Boulders may be present in the larger canyons or areas susceptible to debris flows. Alluvial deposits typically exhibit poor sorting, moderately to poorly developed lenticular bedding, and local cross-bedding. The composition of alluvial deposits is varied, depending on source area and typical stream-flow velocity. Smaller drainages, which are developed on less consolidated and finer-grained bedrock units, typically contain alluvium that is more fine-grained. The fine-grained alluvium is typically of relatively low density and is often compressible. However, the coarse-grained sand and gravel deposits in major drainage courses may be well-consolidated and dense. Older deposits of alluvium are

locally present along the bottoms of the larger drainages in the Preferred Alternative. It is differentiated from active alluvial deposits because it is no longer in the active portion of the stream. Older alluvium is generally similar in lithology to younger alluvium deposits, except the older material may have a higher silt and clay content and may have a higher density.

**Nonmarine Terrace Deposits.** Nonmarine terrace deposits are locally present as uplifted terraces along major drainages and as isolated erosional remnants of alluvial terraces in lower-lying areas in the study area. These deposits have been in place for sufficient time for soil development. Terrace deposits are commonly light brown, yellowish-brown, and gray conglomerate, and reddish-brown sands and gravels that are moderately consolidated and fine- to coarse-grained, possibly with scattered boulders. The finer material commonly forms a matrix around the larger grains and is normally silty and/or clayey. Poorly developed bedding can be lenticular and/or cross-bedded in nature. Scattered clayey buried soil horizons may be present. These deposits are generally well-consolidated and dense, although beds or zones of porous, compressible material may be present. Cobbles and boulders are often present.

**Marine Terrace Deposits.** Marine terrace deposits are present along the coast at the southern end of the Preferred Alternative. The deposits are the result of tectonic uplift and/or changes in sea level that resulted in beach and near-shore deposits being exposed. They are often in a "stair-step" sequence on the coastal-facing mountains at elevations that can be several hundred feet above sea level. They are sometimes broad and level with a slight seaward dip. Along the Preferred Alternative they are 80,000 to 450,000 years old, with the younger deposits located at lower elevations. Soil development in these deposits is dependent on age. Older deposits have well-developed soils with localized, moderately developed calcareous horizons. The deposits are commonly light brown to yellowish-brown to orange, and are fine- to medium-grained sand and silty sand, with local lenses of coarse-grained sand and pebble gravel, especially near the base. Bedding is commonly poorly developed, but can be lenticular and/or cross-bedded. The deposits are typically well-consolidated and dense, except where loosened by weathering.

**Bedrock Units.** The alignments of the SOCTIIP Preferred Alternative cross eight mapped bedrock units, which, from youngest to oldest, are: the siltstone member and turbidite facies of the Capistrano Formation, the Monterey Formation, the San Onofre Breccia, the Sespe Formation, and the Santiago Formation. The general characteristics of these formations are described in the following sections.

**Capistrano Formation.** The siltstone member of the Capistrano Formation is present along the southwest part of the study area. It is encountered beginning approximately 0.5 to approximately 1.0 mile (mi) south of Pico Avenue. Landslides in the area obscure contacts. The siltstone member of the Capistrano Formation is generally composed of medium-gray to brown, clay-rich, micaceous siltstone. Whitish-gray sandstone is common in poorly developed beds and lenses. Locally hard, dark gray to bright orange, calcareous concretions form irregular discontinuous beds. Below the oxidation zones, the siltstone is commonly dark olive-gray and, when freshly exposed, has a strong petroliferous odor. Locally, thin interbeds of well-developed clay are

present. Gypsum-filled joints and irregular seams are common in the oxidized part of the siltstone.

The turbidite facies of the of the Capistrano Formation, also known as the San Mateo Formation, are exposed along the coastal bluffs along the I-5 freeway and up to 2.8 mi inland. The Turbidite facies are exposed both on the surface and also beneath the Pleistocene Marine Terrace Deposits, and may be encountered during deeper excavations along the I-5. It is a nearshore marine sequence composed chiefly of light brown to grey sandstones and cobble conglomerates, and also interbedded siltstones and claystones. Many of the gravels and cobbles were derived from a bedrock source to the east. It is late Pliocene to late Miocene in age (approximately 2–7 Ma). It is generally loosely consolidated, poorly cemented, and subject to landslides.

General characteristics of the Capistrano Formation (siltstone and turbidite facies) are:

- Erodibility is moderate.
- Expansivity ranges from moderate to low.
- Rippability is typically easy.
- Collapsibility/compressibility is generally low.
- Slope stability is generally poor for natural and cut slopes.
- Suitability for fill is poor.
- Liquefaction potential is low.
- Permeability is low.

**Monterey Formation.** The Monterey Formation is exposed in a limited area along the Preferred Alternative beginning approximately 0.5 to approximately 1.0 mi south of Pico Avenue on the west side of Cristianitos Creek and south of the existing electrical substation that is at the end of Avenida Pico. Landslides in the area obscure contacts, so its exposure area may be even smaller.

The Monterey Formation is an interbedded mix of thinly bedded siltstones, claystones, and sandstones. The siltstones are commonly gray to greenish-gray to buff, thinly bedded and commonly diatomaceous and/or tuffaceous. The siltstones are poorly to well-indurated and commonly sandy and/or clayey. The claystones are commonly gray to olive-gray to buff, thinly bedded and commonly sandy or silty. They are generally poorly to moderately indurated. The sandstones are very light gray to gray, commonly stained orange, predominantly very fine- to fine-grained and feldspathic. They are unconsolidated to moderately cemented, generally with calcareous cement, and are commonly micaceous and locally tuffaceous. In most areas, the tuffaceous component of the sandstones and siltstones is bentonitic and can result in beds to about 30 centimeters (cm) (1 ft) of nearly pure clay. Below the oxidation zone, the various lithologies in the Monterey Formation are light gray, to gray, to black. Regionally, the Monterey Formation contains basal coquina limestone beds, travertine beds, and substantial amounts of montmorillonite clay.

General characteristics of the Monterey Formation are:

- Erodibility is high.
- Expansivity ranges from moderate to high.
- Rippability is typically easy.
- Collapsibility/compressibility is generally low.
- Slope stability is generally poor to moderate for natural and cut slopes.
- Suitability for fill is poor.
- Liquefaction potential is low.
- Permeability is low.

**Sespe Formation.** The Sespe Formation is mapped along the northern portion of the Preferred Alternative in Cañada Chiquita. It extends from Oso Parkway approximately 1.0 mi to the south. The Sespe Formation is predominantly an arkosic sandstone with interbedded conglomerate, siltstone, and claystone. The sandstones are reddish to pale orange to light yellowish-gray, medium- to coarse-grained, poorly and thickly bedded, and poorly to moderately well-indurated. They are generally somewhat silty and commonly crossbedded and locally well and thinly bedded. Grains are subangular to subrounded, quartzo-feldspathic in composition, and the sandstones are locally biotite rich. The siltstones and claystones are pale orange to light gray, and also reddish to maroon, generally thinly bedded, and gradational in grain size distribution. Conglomeratic beds are moderately well indurated and contain well-rounded clasts in a subangular sandstone matrix. The conglomerate clasts are commonly volcanic.

General characteristics of the Sespe Formation are:

- Erodibility is moderate.
- Expansivity is low to moderate.
- Rippability is typically moderate.
- Collapsibility/compressibility is generally low.
- Slope stability is generally moderate to good for natural and cut slopes.
- Suitability for fill is good.
- Liquefaction potential is low.
- Permeability is high.

**Santiago Formation.** The Santiago Formation is the most widely exposed formation along the Preferred Alternative. It is present beginning approximately 1.0 mi south of Oso Parkway, and continues for approximately 9.0 mi to the south to contact with the Monterey Formation south of Pico Avenue. The Santiago Formation is marine in origin, with some possible nonmarine parts. It consists predominantly of silty to clayey sandstone with subordinate siltstone with basal conglomerates present in some areas. In the lower parts of the unit, the sandstones are grayish-

yellow to white to very light gray, silty and/or clayey, massive to broadly crossbedded, and moderately to well-indurated. The medium- to coarse-grained sandstones are generally friable, poorly sorted, contain angular grains, and are quartzo-feldspathic in composition. In the upper parts of the unit, the sandstones are grayish-yellow to greenish-gray to brownish-gray, fine- to medium-grained, and poorly bedded. Grains are angular to subangular, poorly to well-sorted, and quartzo-feldspathic in composition with minor biotite. The siltstones are greenish-gray to reddish-brown, sandy and/or clayey, and thinly bedded. In the lower parts, they may be chloritic and are generally lenticular in nature. The basal conglomerates are lenticular in nature and composed of cobbles of red and green metavolcanics, light-colored plutonic rocks, quartzite, and hard sediments. They are massive and well-indurated. Local, thin, lenticular bodies of greenish-gray clay also occur.

General characteristics of the Santiago Formation are:

- Erodibility is moderate.
- Expansivity is low.
- Rippability is typically moderate.
- Collapsibility/compressibility is generally low.
- Slope stability is generally moderate to good for natural and cut slopes.
- Suitability for fill is good.
- Liquefaction potential is low.
- Permeability is moderate to high.

**Geologic Structure.** The dominant structural features of the Peninsular Ranges Province are northwest to west-northwest-trending fault zones. These zones separate large elongated blocks that stand at different structural elevations. Most of the faults either die out to the northwest, or merge with or are terminated by the east-trending steep reverse faults that form the southern margin of the Transverse Ranges Province. Within this framework, the Santa Ana Mountains are a large flexure that has been tilted upward on the east side along the Whittier-Elsinore Fault Zone, producing irregular and complex highlands that slope west toward the Pacific Ocean.

Yerkes et al. (1965) include the Santa Ana Mountains within the east margin of a wedge-shaped central block, which is one of four large subdivisions of the Los Angeles basin. Contacts between adjoining blocks are major fault zones of faulting or flexure in the basement rocks along which vertical and lateral movements took place intermittently during the deposition of the superjacent bedrock units.

Uplift occurred during the Pleistocene along the Whittier-Elsinore Fault Zone. Schoellhamer et al. (1981) suggest that the structure of the northern Santa Ana Mountains is dominated by a broad, north-plunging anticline that underlies the main mass of the mountains and is truncated on the northeast by the Whittier-Elsinore Fault Zone. Numerous north- to northwest-trending, down-to-the-west, normal faults cut the folds into many blocks. In a broad sense, the west limb of the north-plunging anticline appears as a homoclinal sequence (Morton et al. 1973) of mostly westerly-dipping rocks. Three

mapped inactive faults disrupting the strata of the homoclinal feature in the immediate area of the alignments are the Aliso Viejo, Mission Viejo, and Cristianitos Faults. These faults are roughly subparallel to each other and are about 3–5 km (2–3 mi) apart.

**Groundwater.** The presence of groundwater in bedrock units in the study area is generally at depths greater than would be encountered during construction of the Preferred Alternative. However, groundwater may be encountered in deep cuts, particularly those created for landslide and slope stability remediation. Perched groundwater may be encountered locally within cut slopes, ancient landslides, and at fault zones present along the Preferred Alternative.

Groundwater also occurs at relatively shallow depths, on the order of a few meters (several) in some canyon bottoms and local depressions. For example, shallow groundwater conditions were observed in Cañada Chiquita. Other locations of shallow groundwater conditions are segments of Cristianitos Canyon, San Juan Creek, Cañada Gobernadora, Segunda Deshecha Cañada, and San Mateo Creek. Shallow groundwater may also be present to a limited extent in some of the smaller drainages that are not identified as wetlands or having perennial stream flow.

**Faulting and Seismicity.** Being located in southern California, the SOCTIIP study area is in a seismically active region and is subject to seismically related geologic hazards. These hazards are related to the principal regional active faults in the region, which include the San Andreas, Elsinore, San Jacinto, and Newport-Inglewood Faults.

The Preferred Alternative crosses several bedrock faults. However, none of these faults is known to be active, which is defined as having experienced displacement within Holocene geologic time (defined as approximately the most recent 11,000 years). The Mission Viejo Fault has been classified as potentially active, based on displacements of materials of Quaternary geologic age. However, it is not considered to be capable of generating ground shaking as strong as the active regional faults noted above.

In addition to the known, mapped faults, recent studies (Grant et al. 1999; and Rivero et al. 2000) have suggested the possibility of blind thrust faults beneath the San Joaquin Hills (i.e., the hypothesized San Joaquin Hills Blind Thrust) and offshore (i.e., the hypothesized Oceanside and Thirtymile Bank Detachments), although the existence of these thrust faults is speculative. In addition to answering questions regarding whether these blind thrust faults actually exist, additional studies would help to define their recency of activity and their capability to generate large earthquakes in the study area.

## Coastal Zone Setting

The Preferred Alternative within the Coastal Zone is located at the confluence of several mountain ranges in the Peninsular Ranges geomorphic province. The Santa Ana Mountains are located to the north and northeast, and the Santa Margarita and San Onofre Mountains are located to the east at the southern end of the project. Changes in sea level combined with tectonic uplift caused by movement along various faults have produced several elevated marine terraces located on the mountains that flank the coast. Byrd (1998) cites studies that indicate that uplift has averaged 10–40 cm/1,000 years,

and that uplift along the San Diego coast has been measured between 16 and 20 cm/1,000 years. Recent work by Grant et al. (1999) calculated an uplift rate of 21–27 cm/1,000 years, within the San Joaquin Hills, which are located 29 km (18 mi) up the coast from where San Mateo Creek enters the ocean. The majority of the Preferred Alternative within the Coastal Zone is located along some of these younger coastal marine terraces, but it also crossed both San Onofre and San Mateo Creeks, which drain large watershed basins in the local mountains.

One geologic formation and several nonformational geologic units are exposed within the Preferred Alternative in the Coastal Zone. The bedrock formation is the Miocene- to Pliocene-aged turbidite facies of the Capistrano Formation (also known as the San Mateo Formation). The nonformational units include, from oldest to youngest, 413,000- to 450,000-year-old, 120,000-to-413,000-year-old, 120,000-year-old, and 80,000-year-old marine terrace deposits, recent nonmarine terrace deposits, and recent alluvium (Tan, 1999). Although not mapped, Holocene colluvium and recent artificial fill are known to be present within the project area. These geologic units are described in more detail above. A geologic map of the project area within the Coastal Zone is shown in Figure 2.15-1. The Capistrano Formation and the marine terrace deposits have the potential to contain important, non-renewable, paleontological resources. These resources are detailed in a Paleontological Resource Assessment prepared by Smith and Conkling (2007).

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements being required by the Marine Corps. The new gate area facility will include six sentry houses, a 510-square-foot gatehouse, a truck inspection area with canopy, a watch tower, control gates, and a parking area. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

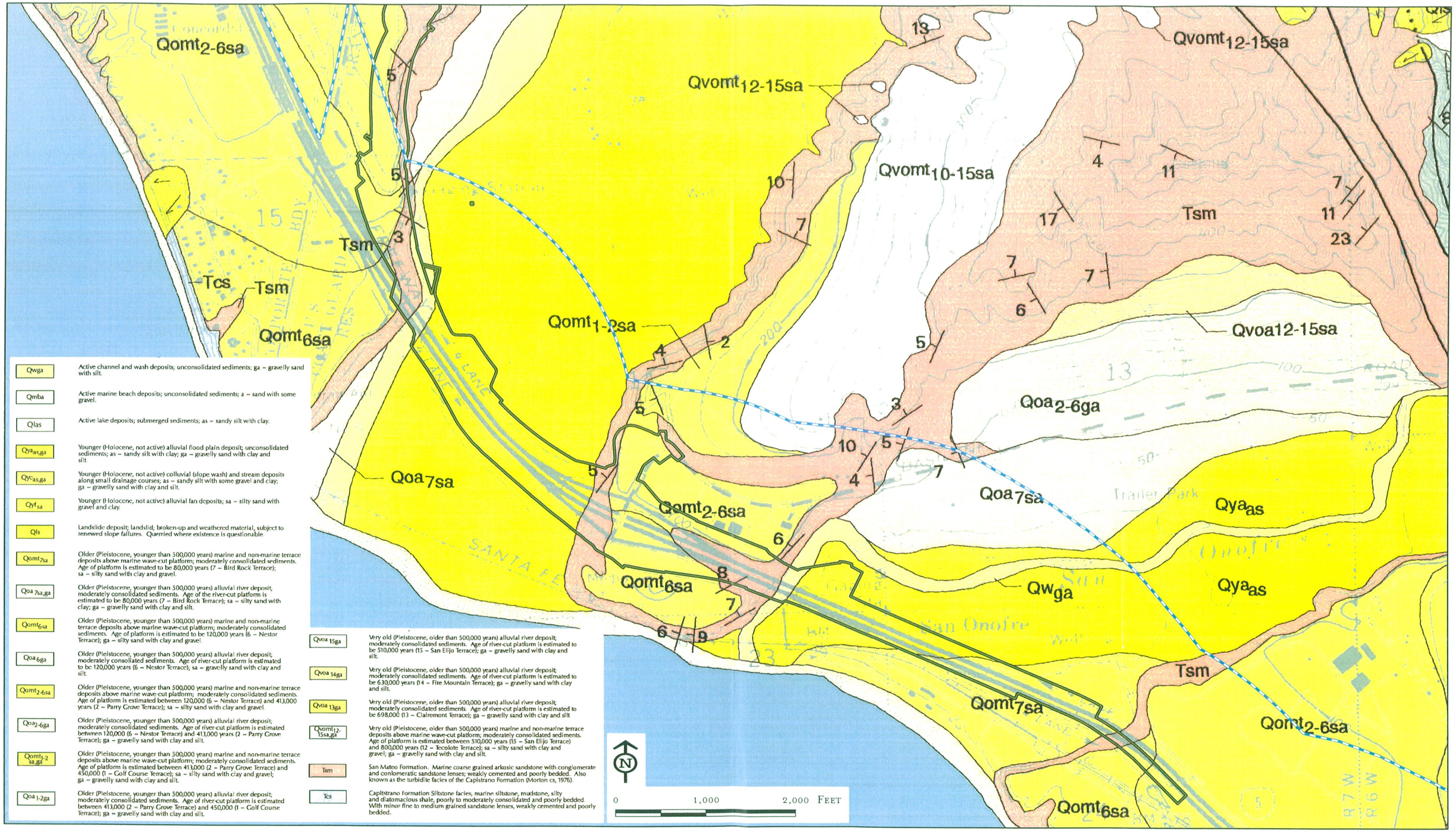
The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.15.3 IMPACTS

### Project Impacts

### Earthquake Damage.

**Fault Movement.** No active faults are known to the Preferred Alternative, and no earthquake fault zones have been mapped along the bedrock faults in the study area. The Preferred Alternative alignment is not within any Alquist-Priolo Earthquake Fault Zones as identified by the State of California. Therefore, the potential for a fault rupture hazard associated with the construction and/or operation of the Preferred Alternative is considered remote.




LSA

Coastal Zone Boundary

Preferred Alternative (11/26/06)

SOURCE: USGS Geology Information - Tan (1999); CDMG (11/29/06)

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FIGURE 2.15-1

*Foothill Transportation Corridor – South*

Geology within the Coastal Zone portion of the SOCTIIP

**Liquefaction.** Regional studies by the CGS (CDMG 2001; CGS 2002) have identified deposits that are potentially liquefiable in the study area. These deposits are located in the Cañada Chiquita, Cañada Gobernadora, San Juan Creek, and Cristianitos Creek drainages. In addition, the site-specific SOCTIIP preliminary studies (Leighton and Associates 2002b) have identified subsurface conditions that indicate a potential for liquefaction along the Preferred Alternative at the I-5 connector and San Mateo Creek. Other areas of sensitivity include Blind/Gabino Creeks, and the upper reaches of Cristianitos Creek, San Juan Creek, Cañada Gobernadora, Chiquita Woods, and Cañada Chiquita at Oso Parkway. The SOCTIIP geotechnical reports provide estimated potential settlements associated with liquefiable deposits along the Alternatives, and typically recommend that focused detailed studies be completed during final design for the selected Alternative to more specifically define the aerial extent of the liquefiable deposits and to develop remedial measures to avoid or remediate potential impacts related to liquefaction in these areas. Because the final design and construction of the Preferred Alternative incorporates these recommendations as part of the defined project, the potential for liquefaction-related damage along the Preferred Alternative would be remote.

**Landslides.** Regional landslide hazard studies by CGS (CDMG 2001; CGS 2002) have identified landslide-prone areas in the study area. The detailed, site-specific SOCTIIP preliminary studies have identified many existing landslides and potentially unstable slopes. Left untreated, these areas could be subject to movement triggered by changed groundwater conditions or strong seismic shaking, and thus, an adverse condition could exist. However, final design will consider these areas in further detail and will develop remedial grading options to stabilize these areas. Final design and construction of slopes and embankments will include the recommended remedial grading identified during the detailed final design studies. Therefore, the potential for earthquake-triggered movements of landslides under the Preferred Alternative would be remote.

**Differential Compaction and Seismic Settlement.** The SOCTIIP preliminary geotechnical studies address seismic settlement associated with liquefaction, but not for nonliquefiable soils that may also undergo settlement due to seismic shaking. Detailed geotechnical studies conducted during final design will further refine the potential for this impact and will provide design and construction recommendations to avoid or reduce this potential hazard. At completion of construction, the potential for damage related to differential compaction/seismic settlement under the Preferred Alternative, would be remote.

**Ground Rupture.** The SOCTIIP preliminary studies did not identify subsurface conditions that indicate a potential for ground rupture associated with lurching or lateral spreading. Detailed geotechnical studies conducted for final design and construction for the selected SOCTIIP build Alternative will either confirm that no such hazard exists or will provide specific recommendations to avoid or reduce effects associated with the potential for ground rupture. Therefore, at the completion of construction of the selected SOCTIIP build Alternative, the potential for ground rupture due to lurching or lateral spreading would be remote.

**Ground Shaking.** The potential for strong ground shaking in the study area cannot be reduced, but the damage potential can be substantially reduced through incorporation of appropriate design and construction techniques. Final design and construction of all of the SOCTIIP build Alternatives will incorporate geotechnical recommendations and current codes and practices relative to the potential for ground motion. Therefore, although the potential for damage due to seismic shaking under all the Preferred Alternative cannot be precluded, that potential will be reduced to normal levels for this type of project as a result of design and construction features.

**Tsunami.** The majority of the Preferred Alternative is sufficiently inland from the coast and/or at a sufficiently high elevation that there is no tsunami hazard to the corridor. However, there may be a potential hazard at the south end of the alignment at I-5. To evaluate the potential hazard, the elevation of the Alternative and the existing I-5 embankment were reviewed. The embankment would provide some protection from a tsunami, and a comparison of that information was made in relation to wave height estimates. According to the Office of Emergency Services, there is no published data that specifically addresses the area at San Mateo Creek relative to potential tsunami wave heights. However, information for other areas along the California coast suggests that wave heights from tsunami may range from approximately 3 to 12 m (10 to 40 ft). The existing I-5 embankment across much of San Mateo Creek is at an elevation of approximately 20 m (65 ft), and therefore, the embankment would provide effective protection to the south end of the Preferred Alternative. There is, however, a potential for wave run-up to travel under the existing bridge over San Mateo Creek, and up the creek toward the corridor. Considering that wave height and energy would be reduced after crossing under the bridge and then spreading out across the valley floor, and that the road would be at an elevation of approximately 20 m (65 ft), the potential hazard due to tsunami is judged to be small for the Preferred Alternative.

**Seiches.** A seiche is a tsunami-type wave in an enclosed body of water such as a lake. There are no lakes or other enclosed bodies of water of sufficient size adjacent to any of Preferred Alternative that would pose a hazard due to seiche. Therefore, there would be no adverse impacts related to seiches under the Preferred Alternative.

**Flooding.** Trampas Canyon Dam is located upstream from the Preferred Alternative. However, because it is under the review of the California Division of Safety of Dams (DSOD), the dam owner is required to demonstrate to the DSOD that the dam meets the stability requirements for potential seismic failure. If it cannot be shown to the DSOD's satisfaction that the dam meets the stability requirements, the DSOD would require that the dam be upgraded or removed from service. Since the Trampas Canyon Dam has been reviewed by the DSOD and meets the seismic stability requirements, the potential for downstream flooding is considered to be remote and not a potential impact under the Preferred Alternative.

**Waste Disposal Problems.**

**Change in Groundwater Level.** Locally, temporary construction dewatering may be required during construction of the Preferred Alternative. However, no long-term groundwater pumping is

anticipated. Therefore, there is a potential for temporary impacts (lowering of water levels) at local groundwater wells, but no permanent impacts are anticipated related to dewatering.

If there are currently unknown active wells discovered within the disturbance limits of the Preferred Alternative, they would be abandoned properly and would be replaced as part of project construction; therefore, no long-term adverse impacts to groundwater levels are anticipated.

The Preferred Alternative has the potential for temporary impacts (lowering of water levels) at local groundwater wells during construction and may require the replacement of some existing wells. In addition, the Preferred Alternative has the potential for permanent groundwater level lowering at a mapped spring located approximately 0.8 km (0.5 mi) south of Ortega Highway.

**Disposal of Excavated Material.** The Preferred Alternative requires additional cut compared to the A7C-FEC-M-Initial Alternative, as a result of (1) shifts in the alignment, and (2) the reduction of visual impacts to future residential development that will be part of the Ranch Plan by lowering the grade of the road. The Preferred Alternative will require 17 million cubic meters (cm) of cut and 14.7 cm of fill. The 2.3 million cm imbalance can be accommodated within the disturbance limits. Therefore, the Preferred Alternative will not require off-site disposal of excess material.

**Percolation of Waste Material.** Based on the Hazardous Materials and Hazardous Waste Sites Technical Report (P&D Consultants 2003), construction of the SOCTIIP build Alternatives may involve contaminated soils but is not anticipated to involve contaminated groundwater. Any construction-related disturbance or handling of contaminated soils would be conducted in compliance with existing federal, State, and local regulations related to the handling, storage, removal, and disposal of contaminated soils. Therefore, there would be no adverse impacts under the Preferred Alternative, related to the percolation of contaminated water, nor water leaching undesirable constituents from fill soils and then percolating into the subsurface.

**Slope and/or Foundation Instability.**

**Landslides and Mudflows.** As discussed earlier, many landslides have been identified along the Preferred Alternative. Final project design will consider these areas in further detail and will develop remedial grading to ensure that slopes are stable at the completion of construction. Therefore, at completion of construction of the Preferred Alternative, the potential for damage related to landslides and mudflows would be remote.

**Unstable Cut and Fill Slopes.** Many potentially unstable cut slopes were identified in the preliminary SOCTIIP geotechnical/geologic report. Remedial grading is included in the description of the Preferred Alternative to provide stable slopes at the completion of construction. Therefore, at the completion of construction, the potential for damage related to slope stability under the Preferred Alternative would be remote. For all other cut-and-fill slopes, final design and construction will incorporate standard design practices to avoid unstable conditions. Therefore,

the potential for unstable conditions at the completion of construction of the Preferred Alternative is considered remote.

**Collapsible and Expansive Soil.** The SOCTIIP preliminary studies identified locations where existing soils have the potential for collapse or expansion that could damage structures of the build Alternatives and identified conceptual remedial measures for these areas. The remedial grading for expansive and liquefiable soils identified in the preliminary plans for all the SOCTIIP build Alternatives was developed based on the general criterion that these types of soils would have the potential to cause distress to pavement or structures and would be remediated to a depth that mitigates the concern. This remedial grading occurs within the defined disturbance limits for the Preferred Alternative. Final design studies will further locate, evaluate, and provide design requirements to address these soils so that, at the completion of construction, the potential for damage related to soil collapse or expansion under the Preferred Alternative would be remote.

**Trench Wall Stability.** Trench wall stability will be ensured through final design for the Preferred Alternative. Final design, together with standard construction safety requirements, will be adhered to during construction of the Preferred Alternative. Therefore, potential hazards associated with trench wall stability will be avoided under the Preferred Alternative.

**Erosion, Sedimentation, and Flooding.**

**Erosion of Graded Areas.** The Preferred Alternative will create new cut-and-fill slopes and other graded areas that would be subject to erosion if not adequately controlled. Project design and construction will include features to protect slopes from erosion so that upon completion of construction, there would be no net increase in erosion over natural conditions. Refer to Section 4.9 (Affected Environment, Impacts and Mitigation Measures Related to Water Quality) of the Final SEIR for more information.

**Alteration of Runoff.** The Preferred Alternative will be designed and constructed so that runoff will be appropriately controlled and directed to be consistent with natural conditions. Refer to Section 4.9 of the Final SEIR for detailed discussion of issues related to runoff and runoff management.

**Unprotected Drainage Ways.** The Preferred Alternative will be designed and constructed to include/incorporate evaluations and recommendations regarding flow in all drainage ways, and protective measures would be constructed where needed. As a result, there would be no adverse impacts of the Preferred Alternative related to drainage ways.

**Increased Impervious Surfaces.** The Preferred Alternative will include the construction of new pavement and various related structures that will reduce the amount of natural ground surface over which percolation of rainfall and other surface water can occur. The total area of new

pavement for the Preferred Alternative is a relatively small fraction of the total surface area of the drainage basins in the study area. The Preferred Alternative will result in 26 km (16 mi) of new pavement and related structures. For a detailed discussion on issues related to impervious surfaces, refer to Sections 4.8 and 4.9 of the Final SEIR.

**Land Subsidence.**

**Extraction of Groundwater, Gas, Oil, and Geothermal Energy.** There are no known ongoing or planned large-scale extractions of groundwater, gas, oil, or geothermal energy that could cause subsidence in the Preferred Alternative. Therefore, there would be no adverse impacts under the Preferred Alternative related to land subsidence.

**Hydrocompaction and Peat Oxidation.** Final design and construction of the Preferred Alternative will provide for the removal and replacement of soils that are subject to hydrocompaction or that have substantial quantities of peat. Therefore, at the completion of construction, the potential for ground surface settlement due to hydrocompaction or peat oxidation under the Preferred Alternative would be remote.

**Volcanic Hazards.**

**Lava Flow.** There are no active or potentially active volcanoes in the region of the Preferred Alternative. Therefore, there would be no adverse impacts related to lava flow under the Preferred Alternative.

**Ash Fall.** Potentially active volcanoes are sufficiently distant from the Preferred Alternative that the Preferred Alternative would not be subject to adverse impacts related to ash fall.

### Impacts in Coastal Zone

No known faults are mapped as crossing or projecting toward the Preferred Alternative alignment in the Coastal Zone in available geologic literature. Several active faults exist within the region that could produce groundshaking along the FTC-S alignment. The nearest active fault is the Newport-Inglewood-Rose Canyon Fault located offshore approximately 4 mi away.

Quaternary age alluvial deposits have been mapped in the Coastal Zone along the Preferred Alternative alignment. These generally unconsolidated sedimentary deposits may experience some seismic settlement during strong groundshaking from a seismic event. The roadway and bridges will be designed to accommodate any seismic settlement that is estimated to occur.

No landslides have been mapped in close proximity to the Preferred Alternative alignment within the Coastal Zone.

## 2.15.4 MITIGATION

Mitigation measures were provided in the Mitigation Monitoring Program (MMP) for Final Environmental Impact Report No. 3 (EIR No. 3) for the Foothill Transportation Corridor – Oso Parkway to Interstate 5, to minimize the impacts to earth resources identified for the alignments analyzed in that EIR. All the mitigation measures in the MMP for EIR No. 3 were reviewed and have been incorporated, as applicable, in the mitigation measures for the SOCTIIP Alternatives. Mitigation measures for earth resources are listed below and in the Mitigation Monitoring and Reporting Program included as Appendix A of this document.

**G-1** Prior to final design for the selected Alternative, a design level geotechnical report will be prepared for the selected Alternative. This report will document potential soil-related constraints and hazards such as slope instability, settlement, liquefaction, or related secondary seismic impacts that may be present. Acceptance of the report will be subject to approval by the Transportation Corridor Agencies (TCA) and other agencies that may have jurisdiction. A minimum factor of safety of 1.5 shall be used to determine the final slope configuration. The report shall also include:

- Evaluation of potentially expansive soils and recommendations regarding construction procedures and/or design criteria to minimize the effect of these soils on the development of the corridor.
- The design-level geotechnical studies will identify potentially liquefiable areas and provide recommendations for mitigation. Any areas that require mitigation would be within the disturbed areas, and no additional impacts would result.

**G-2** In conjunction with final design, it will be demonstrated that side slopes shall be designed and graded so that the potential for surface erosion of the engineered fill is not increased from natural conditions.

**G-3** In conjunction with construction activity, native vegetation with good soil-binding characteristics and low water requirements will be planted on engineered slopes to reduce erosion and slope instability.

**G-4** A quality assurance/quality control plan will be maintained during construction. This will include observing, monitoring, and testing by a geotechnical engineer and/or geologist during construction to confirm that geotechnical/geologic recommendations are fulfilled, or if different site conditions are encountered, appropriate changes are made to accommodate such issues.

**G-5** Once a final project alignment has been selected, a detailed review will be made to locate all groundwater wells within the project footprint. Any groundwater wells that occur within the project footprint will be abandoned properly during project construction. As may be required, (i.e., for active wells), the water supply provided by the well will be replaced. Replacement water may be provided by a variety of means such as installing a new well or a connection to municipal supply.

## 2.15.5 CONCLUSION

The analyses conducted for the Draft EIS/SEIR found that potential effects to Earth Resources could be reduced to below a level of significance for the Preferred Alternative. Geotechnical investigations specific to the Preferred Alternative, including boring sampling and testing, are currently underway. Recommendations that are developed as a result of these investigations will be incorporated into the final design of the project.

# 2.16 MILITARY USES AND CAMP PENDLETON

## 2.16.1 INTRODUCTION

The southern 4 miles (mi) of the proposed Foothill Transportation Corridor-South (FTC-S) are located on Marine Corps Base (MCB) Camp Pendleton (the Base). Of the 4 mi, approximately 2 mi of improvements are within the Coastal Zone. The northbound and southbound connector ramps at the I-5/SR-241 confluence are within the Coastal Zone. The connector ramps are elevated; the northbound ramp is elevated for approximately 4 miles, and the southbound ramp is elevated for approximately 4.25 miles. There will be improvements to an almost 2-mile segment of I-5, including the Basilone Road interchange, in the Coastal Zone. All of the project area in the Coastal Zone is also located on MCB Camp Pendleton and has the potential to impact military training operations at the Base.

The potential impacts of the proposed project to the Military Mission of MCB Camp Pendleton are evaluated in detail in the Military Impacts Technical Report (P&D Consultants, 2003) and are summarized in Section 4.21 of the Final SEIR.

## 2.16.2 SETTING

### Study Area Setting

MCB Camp Pendleton is the Marine Corps' only amphibious training center for the west coast of the United States. With over 125,000 acres (ac) of land, 18 mi of beaches, training areas, ranges, and restricted airspace, the Department of the Navy (DON) considers MCB Camp Pendleton an irreplaceable military training installation.

The portion of MCB Camp Pendleton in the vicinity of the proposed FTC-S includes heavily used training areas, artillery firing areas, a para-drop zone, a Helicopter Outlying Landing Field (HOLF), a helicopter heavy lift pad, numerous live-fire ranges, Green Beach (which is used to support amphibious landing exercises), and the northwesternmost maneuver corridor capable of supporting battalion-sized training exercises. A portion of MCB Camp Pendleton's most vital assets (its special use airspace [SUA], which includes Restricted Areas R-2503A, R-2503B; and the San Onofre High and Low Military Operations Areas [MOAs]) overlay a portion of the FTC-S study area. The type of training conducted by military personnel at MCB Camp Pendleton has been identified by DON as critical to the development of individual and unit combat skills and the essential teamwork capabilities that are required for a Marine Air/Ground Task Force (MAGTF) to be successful on the battlefield.[1]

The MCB Camp Pendleton land and airspace areas were established by Congressional and other federal actions to provide for the segregation and containment of military training activities

[1] Marine Corps Strategy 21, www.pendleton.usmc.mil; click on Publications.

considered to be of a hazardous or near-hazardous nature. Designation of these special use land and airspace areas has two substantial benefits:

- Military training can occur in the realistic and relatively unimpeded manner required for an effective national defense.
- The safety of the public and military personnel are simultaneously protected.

An existing nonmilitary use of MCB Camp Pendleton is San Onofre State Beach (SOSB). There are four subunits within SOSB.

SOSB operates under a 1971 lease agreement with the Marine Corps (United States of America) and the State of California Deparment of Parks and Recreation. As stipulated in the lease, the Marine Corps expressly retains the right to use the entire State Park for military training, with 48 hours notice. Maintaining the availability of Camp Pendleton for training, including the leased area, is vital to the mission of the Base and to national security.

At the time that the Draft EIS/SEIR was prepared, there were also agricultural uses on MCB Camp Pendleton within the FTC-S study area. Since that time, the leases have expired and the agricultural uses have been terminated. The former agricultural areas are being used for military training.

The United States has granted an easement to the California Department of Transportation (Caltrans) for the I-5 freeway where it transects MCB Camp Pendleton. Approximately 2 mi of the I-5 is located in the FTC-S study area. There are also utility infrastructure on MCB Camp Pendleton in the FTC-S Study Area, notably San Diego Gas and Electric (SDGE) substations and power lines and Southern California Edison (SCE) power lines.

### Coastal Zone Setting

Approximately 138 ac of the FTC-S disturbance limit area is located in the Coastal Zone. The area within the Coastal Zone is completely within MCB Camp Pendleton. The military uses in the Coastal Zone include military training areas, military housing, and the Green Beach amphibious training area, as well as MCB Camp Pendleton San Onofre Recreational Beach. The nonmilitary uses in the Coastal Zone include the Caltrans easement for I-5, a small portion of SOSB Subunit 1, SOSB Subunit 2, SOSB Subunit 3, and utility infrastructure as described in Section 2.19. Potential impacts to recreation uses are summarized in Section 2.23.

### Updated Information

As noted above, in the period since the Draft EIR/SEIR was prepared, the agricultural lease in the FTC-S study area has expired and the uses terminated.

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements as required by the Marine Corps. The new gate area facility will include six sentry houses, a 510-square-foot gatehouse, a truck inspection area with canopy, a watch tower, control gates, and a parking area. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.16.3 IMPACTS

Impacts to military uses are defined by the potential for the project to interrupt or impede the Marine Corps Mission at MCB Camp Pendleton.

SOSB is held by State Parks by virtue of a 1971 agreement of lease with the United States. The State Parks' lease with the United States is specifically subject to the right of the United States to grant additional easements and rights-of-way over the leased property. See Section 2.23 for more information regarding impacts to recreation resources.

### MCB Camp Pendleton Mission

The Mission of MCB Camp Pendleton is to ". . . operate an amphibious training base that promotes the combat readiness of operating forces by providing facilities, services, and support responsive to the needs of Marines, Sailors and their families."[1] Camp Pendleton is the Marine Corps' premier amphibious training base and its only West Coast amphibious assault training center. Approximately 40,000 training events are scheduled at Camp Pendleton each year. These range from small unit training to Regimental and Marine Expeditionary Brigade (MEB) exercises. Nearly 60,000 personnel train at Camp Pendleton every year. Camp Pendleton provides training facilities for many active duty and reserve Marine, Navy, Army, Air Force, and National Guard units, as well as other national, Sate, and local agencies. The most vital assets on the Base are those that directly support the military training mission of MCB Camp Pendleton.

When Camp Pendleton was first established in 1942, the Base was sized to fit the training needs and weapon systems of that time. At the time of its acquisition, the Base was located in a rural setting with little urban or suburban development in the surrounding areas. The surrounding communities were relatively small. During the 1940s, 1950s, and 1960s, there were relatively few environmental regulations, and no encroachment threats seriously affected the training mission of Camp Pendleton Marines. Beginning in the 1970s, however, with passage of the federal Endangered Species Act (ESA), along with increasing urbanization and population growth in adjacent San Diego and Orange County communities, Camp Pendleton began to experience the initial effects of encroachment. While the Base's boundaries have essentially remained the same since 1942, the footprints of today's modern weapon systems have become larger. At the same time, the once rural, lightly populated communities around Camp Pendleton have become urbanized. Rapid growth in southern Orange County and northern San Diego has resulted in urban development abutting or approaching the

[1] MCB Camp Pendleton Strategic Plan, 2001.

borders of Camp Pendleton. Urban sprawl has now become a close neighbor of the Base and its many training areas, which were once considered remotely located.

Due primarily to this urban growth and regional development, many sensitive habitat areas have diminished in both acreage and value in many areas surrounding the Base. This has created two substantial encroachment issues at Camp Pendleton. The first relates to the refuge aspect of the Base. Species pushed from their habitats because of development in neighboring areas are migrating to native habitat areas on the Base, thereby creating unnatural population concentrations on the Base and making once active parts of it virtually unusable for some military training activities. Second, because of Camp Pendleton's mostly undeveloped habitat along the coast, coastal bluffs, and foothill areas of the Base, and because it has such large, viable expanses of undeveloped habitat areas, Camp Pendleton is an obvious choice to regulators when addressing habitat preservation issues. Notwithstanding the fact that the purpose of MCB Camp Pendleton is not related to ecological preservation, these forms of environmental encroachment remain a real and recurring threat to the current and future military training mission of the Base.[1]

Camp Pendleton is the Marine Corps' premier west coast training facility. Yet it faces acute training constraints as a result of encroachment. The continuing growth in environmental regulations has led to restrictions that impede firing, movement, maneuver, communication, and flight operations, thereby creating a complex dilemma that measurably impacts training costs and readiness. It is not the effect of a single regulation or restriction that is harmful, but the combined effect of many regulations/restrictions and the unintended and parallel restraints they have spawned. For example, an assessment of 739 military training tasks determined that encroachment has a measurably negative impact on field training at Camp Pendleton. The data indicated that all field training assessed at Camp Pendleton is affected to some degree by encroachment. Ground training tasks are impacted the most. Based on quantitative assessment, it was determined that any Battalion Landing Team training on Camp Pendleton in a notional, four-phase tactical training scenario is only able to complete its required nonfiring tasks to less than 68 percent of the Marine Corps standard. The findings of this assessment demonstrate that Camp Pendleton's ability to provide the full range of realistic combat training opportunities for Marines operating on and deploying from the Base is substantially hindered by encroachment.[2]

Spatial analysis of the training areas on Camp Pendleton determined that each of the 33 training areas on Camp Pendleton has some type of terrestrial restriction on training. These restrictions included factors such as the presence of endangered species, rare plants, cultural resources, vernal pools, critical habitat, and other designated environmentally sensitive areas. The total amount of restricted land area on Camp Pendleton is 16,111 ac, or 23.2 percent of training areas, not including areas that are restricted due to safety concerns.

In addition to the issue of restrictive environmental regulations, Camp Pendleton as a whole is further encumbered by several existing real estate easements or leases granted over the past 40 to 50 years to a variety of non-Department of Defense (DoD) entities. For example, long-term land leases or easements have been granted for such non-DoD activities as a State Park and public use beach (2,000 ac); and construction of a nuclear power plant (400 ac), a Boy Scout campground, six public

1 Larry Rannals, 2002, as included in the Military Impacts Technical Report.
2 Camp Pendleton Quantification Study 2003; not for public distribution.

elementary schools, and various other public utility right-of-way land uses. An interstate freeway (Interstate 5 [I-5]), double-tracked rail line (for both freight and passenger train operations), and a variety of transmission lines for electrical power, natural gas, water distribution, aviation fuel, telephone, telecommunication, and fiber optic cables crisscross numerous areas of the Base. All these entities represent various forms of manmade encroachments that impede on the Marine Corps' ability to use certain areas of the Base for military training operations.

Camp Pendleton consists of approximately 125,000 ac of land area. Currently, 35,000 Marines and sailors are home-based at Camp Pendleton. The largest of Camp Pendleton's tenant units is the 1st Marine Division, which contains three Regiments (two infantry and one artillery) and other supporting organizations totaling approximately 12,000 personnel. Marine Corps doctrine specifies that a realistic-sized area for the training of a Brigade-sized unit (approximately 5,000 personnel) requires a minimum of 162,000 ac to properly train/exercise a unit of this size in the use of appropriate tactical maneuvers.[1] Considering the many already-present constraints to training currently existing on Camp Pendleton, the 125,000 ac size of this Base is insufficient and well below the required Marine Corps standard for the training of a Brigade-sized unit. Thus, the three Regiments and other units of the 12,000-member 1st Marine Division do not have nearly the available training space that a unit of this size ought to rate under the Marine Corps standard and, therefore, are not training under optimal conditions or on realistically sized areas.

With an ever-evolving military mission, including combat training operations coupled with the Marine Corps' new homeland security responsibilities as well as the potential for many new, but currently unforeseen, missions in the future, the retention of all land at Camp Pendleton is identified by the DoD as critical to protecting the Marine Corps' long-term capability to train at this Base.

Thus, the Marine Corps considers the loss of any Base property, even if not currently used for training purposes, to be an adverse impact on its ability to train and meet future mission requirements.[2]

Camp Pendleton has an extensive history of involvement with the planned southern extension of the FTC-S. In 1988, the Marine Corps stated its position regarding the potential for construction of a corridor project on Camp Pendleton land.[3] The Marine Corps agreed, in consultation with the TCA, to the evaluation of one potential alignment of the southern extension of the FTC on the Base subject to several conditions, including the stipulation that any toll road alignment on Camp Pendleton must not impact or interfere with the operational flexibility of the Marine Corps Mission at that Base. In 1992, the TCA and Camp Pendleton mutually agreed on one alignment for the FTC on the Base.[4] That alignment represents the one and only alignment that meets the Marine Corps' 1988 stipulations for constructing a corridor project on Camp Pendleton. Since 1988, the Marine Corps has consistently maintained that no alignment other that the one previously agreed to would be permitted on Camp Pendleton. This alignment was considered acceptable because it is located near the Base boundary and has minimal adverse effect on the military training activities. The agreed-to alignment through MCB Camp Pendleton is reflected in the Preferred Alternative alignment.

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1 U.S. Army Training Circular 25-1 dated 1991.
2 Larry Rannals, 2002.
3 Commandant of the Marine Corps (Gray) letter to TCA, May 23, 1988.
4 "Statement of Intent Regarding Foothill Transportation Corridor Oso Parkway to I-5, Modified C Alignment," March 4, 1992.

Camp Pendleton was provided an opportunity to address the Collaborative with respect to the Marine Corps position on this proposed FTC-S. During this opportunity, Camp Pendleton reiterated the Marine Corps' long-standing 1988 position that only one proposed alignment of this transportation corridor would be authorized for evaluation on the Base. Yet, despite this Marine Corps position, the Phase I Collaborative agreed during the alternatives development process to include two additional Camp Pendleton alignment alternatives on the list for consideration during the environmental analysis phase of the project. In addition to the FEC-Alternative (consistent with the Preferred Alternative alignment through MCB Camp Pendleton), these added alternatives were the FEC-Agricultural Fields Variation Alternative, and the FEC-Cristianitos Variation Alternative. These two additional on-Base alternatives were included as project alternatives without consultation with or participation by Camp Pendleton. The Marine Corps has consistently indicated its strong opposition to these two additional Camp Pendleton alignments without Marine Corps concurrence.

Once Phase II of the Collaborative process was initiated in early 2001, Camp Pendleton was invited to participate in the Collaborative, and is currently a participating agency. Throughout the Phase II process, the Marine Corps has consistently maintained its long-held position that only the FEC Alternative meets the Marine Corps' 1988 stipulations for constructing a corridor project on Camp Pendleton and is consistent with the 1992 Statement of Intent. The Marine Corps (Camp Pendleton) is a cooperating federal agency on the EIS for the SOCTIIP.

### Short-term Impacts Related to Special Use Airspace

Typical construction activities include clearing and grubbing, earthmoving (rough, final, and remedial grading), installation of drainage facilities and pavement, bridge construction, cranes, pile driving, equipment, drillings, utility and light installation, and landscaping. SUA in the SOCTIIP study area for the Base occurs from the ground surface to as high as 2,438.4 m (8,000 ft) above mean sea level (amsl) in R-2503A and the San Onofre High and Low MOA. A short-term impact that must be considered for airspace is visibility. Other than short-term, localized fugitive dust, and remote risks associated with wildfire hazards during construction, there are no impacts on the Base SUA anticipated during construction of the Preferred Alternative. Because SUA is generally associated with airspace and is not as sensitive to ground disturbance activities, the Preferred Alternative will not impact the Base SUA because no impacts are expected to occur in the airside environment.

The exception is related to the use of cranes, which may remain extended to a height of 12.2 m (40 ft) or more during nighttime hours. The majority of construction equipment will be less than 5.2 m (17 ft) in height. The exception is cranes, which could exceed 12.2 m (40 ft) in height when they are extended and in use. Cranes left in the extended position at these heights could pose a risk to low-flying aircraft. This is a potential adverse impact during construction of the corridor and I-5 Alternatives on and in the vicinity of Camp Pendleton.

The relocation of utility poles and towers is not expected to adversely affect SUA, as the new utility locations are in the approximate area of existing infrastructure. Coordination with MCB Camp Pendleton during construction of the relocated utilities and the proposed transportation facility will address potential short-term impacts relative to cranes, utility poles, and towers.

### Short-term Impacts Related to Aviation Training Activities

For aviation training activities, the Preferred Alternative will result in an adverse, short-term impact associated with military aircraft and helicopters that engage in various training operations. The increased vehicle and construction activities on the Base, within the construction limits for the Preferred Alternative, could result in a restriction of external load operations, including SPIE rigging, for the period of construction. In addition, there are potential adverse impacts associated with the use of cranes that may remain extended to a height of 12.2 m (40 feet) or more during nighttime hours and with the relocation of utility poles and towers. Cranes left in the extended position at these heights could pose a risk to low flying aircraft. This is a potentially adverse impact during the construction of the Preferred Alternative, necessitating communication and coordination between TCA, its contractors, and MCB Camp Pendleton staff.

### Short-term Impacts Related to Ground and Amphibious Training

The construction of the Preferred Alternative would result in an adverse impact related to ground training activities for the entire construction period and through operations. During construction and operations, the Preferred Alternative would create a linear barrier between the northernmost part of the Base adjacent to the City of San Clemente and the remainder of the Base. Troop movement in this area would be impeded. The amount of land that would be segmented from the rest of the Base for implementation of the Preferred Alternative is estimated to be 392 ac.

Because construction for the Preferred Alternative would result in the removal of property from future Base use, and would impede or affect training movements, an adverse impact on the Military Mission of Camp Pendleton related to ground and amphibious training will result. However, because military training has historically been relatively minimal within this area of the Base, the Marine Corps has consistently indicated that the encroachment impact created under the Preferred Alternative and the resulting segmentation of approximately 392 ac of Base property would be consistent with conditions previously agreed to by the Marine Corps and the TCA in 1992 regarding any potential implementation of this project on the Base (i.e., only one alignment to be studied on the Base; that one alignment must be as close to the northern Base boundary as possible; and the alignment must not interfere with the Mission or operational flexibility of Camp Pendleton). The Preferred Alternative is also consistent with the National Defense Authorization Act for Fiscal Year 1999, which specifically states that an easement for this project would be granted based on a survey found satisfactory to the Secretary of the Navy and on the Secretary's consideration of the protection of the interests of the United States (Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, Conference Report to Accompany H.R. 3616, September 23, 1998).

### Short-term Impacts Related to Base Security

The construction areas for the Preferred Alternative cross Base property and, therefore, would potentially provide an opportunity for unauthorized access to the Base from the construction areas. Maintaining the integrity of the existing security at Camp Pendleton is necessary to protect the training missions and assets on the Base. Because of the creation of the opportunity for unauthorized access to the Base, construction of the Preferred Alternative will result in the potential for adverse impacts on Base security.

### Long-term Impacts Related to Special Use Airspace

The operation of the Preferred Alternative in that part of the Base where the SUA overlies Camp Pendleton would have no impact on either the configuration or use of SUA because no changes to the rules governing use of the airspace would be needed during operation of the corridor. Military fixed-wing aircraft and helicopters would continue to be able to use R-2503A and R-2503B as egress/ ingress routes to aviation and ground-training facilities at the Base. Restricted airspace R-2503A would remain designated from the ground surface to 609.6 m (2,000 ft) amsl and the San Onofre Low MOA and High MOA would remain at 609.6 m (2,000 ft) to 1,219.2 m (4,000 ft), and 1,219.2 m (4,000 ft) to 2,438.4 m (8,000 ft), respectively. With the exception of some Marine Corps concern about effects on night vision goggle training operations along the northern perimeter of the Base, described in the following section, the Preferred Alternative will not adversely impact SUA above the ground surface on the Base.

### Long-term Impacts Related to Aviation Training Activities

Helicopters typically fly at altitudes below 61 m (200 ft) above ground level (AGL) throughout the San Mateo Valley. Operation of the Preferred Alternative would increase vehicular traffic in an area that is currently relatively undeveloped. This increase in traffic could result in a restriction of external load operations, including SPIE rigging, on this part of the Base. This increase in traffic and associated lights and motion would impact the effectiveness of night vision goggle training in the area and could potentially become a hazard to low-flying helicopters in the immediate area. There are existing lighting distractions in the SOCTIIP study area, namely, the cantonment areas (Talega, Cristianitos, San Mateo, San Onofre) and vehicular traffic on existing on-Base roads and on I-5. The additional night lighting associated with vehicles on the corridor and facility lights under the Preferred Alternative would contribute to cumulative adverse light impacts in this part of the Base. This additional cumulative lighting added by operations under the Preferred Alternative on Camp Pendleton could adversely affect future night vision goggle training operations along the northern perimeter of the Base.

The Preferred Alternative will have an adverse impact on aviation training, specifically external load operations, on this part of the Base. A similar situation currently exists within the boundaries of MCB Camp Pendleton and under Restricted Airspace R-2503A. Military aircraft, including helicopters, engage in various air operations over and adjacent to existing I-5. Restrictions prohibiting external load operations, including SPIE rigging over I-5 within R-2503A, are attributed to concern for the safety of vehicular traffic on I-5. A similar aviation safety precaution must also be exercised with respect to any planned helicopter external load operations occurring above proposed on-Base SOCTIIP routes. Therefore, the Preferred Alternative may result in an adverse impact on future external load operations along the northern perimeter of the Base.

The RCUZ Program (1993) classifies recurring areas of aviation overflight on Camp Pendleton as RSZ E. RSZ E areas represent areas of the Base having frequent aviation overflight and include those areas most frequently used by aircraft entering or departing the ranges or operating on low-altitude navigation training routes. Public rights-of-way are considered to be conditionally compatible with aviation overflight. The Preferred Alternative would lie directly beneath a designated aviation

overflight area (RSZ E) on the Base. As a public right-of-way, the corridors under the Preferred Alternative would be conditionally compatible with aviation overflights.

Aircraft arrival and departure patterns in and out of the HOLF may result in low-altitude overflight of the Preferred Alternative. One function of the HOLF is to support low-ambient-light night vision goggle training for helicopter aircrews. For safety and effectiveness, night vision goggle training must be conducted in darkened, uninhabited areas that offer few lighted distractions. The presence of the corridor under the Preferred Alternative, with moving lighted vehicles in proximity to the HOLF, would conflict with the objectives of night vision goggle training. In addition, the interchanges at Cristianitos Road and Avenida Pico would be illuminated by pole lights in accordance with Caltrans standards. Therefore, the impacts of the Preferred Alternative on operations associated with the HOLF on this part of the Base would be adverse.

### Long-term Impacts Related to Ground and Amphibious Training

The long-term impact of the Preferred Alternative on ground-training activities would be adverse. The operation of the Preferred Alternative would result in a linear barricade between the northernmost part of the Base adjacent to the City of San Clemente and the remainder of the Base. Troop movement and training activities in this area would be permanently impeded by the presence of the corridor. Although the Preferred Alternative would traverse property currently leased to the State of California Department of Parks and Recreation and areas not historically or recently used for military training activities, the Marine Corps would forfeit any future opportunity to maneuver troops in the area occupied by the Preferred Alternative and in the land area between the alignment of the Preferred Alternative and the boundary of the City of San Clemente. Under the lease agreement with the Department of Parks and Recreation, Camp Pendleton is allowed to use San Onofre State Beach for training with 48 hours' prior notice. This area could be used as an active training area. Therefore, this area does have some available training utility in its present, non-fragmented state. The area that would be segmented from the Base is approximately 392 ac. However, this segmented area of the Base would not prove suitable for future military training purposes once it is severed from other training areas with implementation of the Preferred Alternative. This segmented area would not provide a useful-sized area or a realistic training scenario from which to conduct military training activities. While this segmented area might potentially be used for other functions such as resources protection/management or recreation activities, it would not be suitable for use as a military training area. Therefore, the permanent acquisition of an easement for implementation of the Preferred Alternative and the resulting segmentation of this area of potential training land on the Base would result in an adverse impact on the Military Mission of Camp Pendleton.

However, as noted earlier, the Preferred Alternative are consistent with the 1988 Commandant Letter and the 1992 Statement of Intent for constructing a corridor project on Camp Pendleton.

Operation of the Preferred Alternative would increase vehicular traffic in an area that is relatively undeveloped. This increase in traffic and its noise, lights, and motion would impact the effectiveness of night training operations in the area. There are existing lighting distractions in the SOCTIIP study area in each of the cantonment areas associated with vehicular traffic along existing on-Base roads and I-5. As a result, as described earlier, the Preferred Alternative would contribute to continued adverse light impacts in this part of the Base.

Green Beach, in the vicinity of the Preferred Alternative at the I-5 interchange, is an access/egress point for amphibious training activities. Vehicular access from Camp Pendleton to Green Beach will be maintained via the existing Beach Club Road. Access for the planned LCAC craft training activities at Green Beach would be accommodated under the Preferred Alternative. In addition, the Preferred Alternative is designed to provide enhanced access for MCB Camp Pendleton in support of its military training mission. Therefore, the operation of the Preferred Alternative would not result in adverse impacts related to the planned future LCAC training activities.

From a land use compatibility and safety perspective, training areas are of moderate safety concern. As discussed earlier under Aviation Activities, the RCUZ Program classifies primary aviation overflight corridors as RSZ E. The Preferred Alternative would lie directly beneath a designated aviation overflight area (RSZ E) on the Base. As a public right-of-way, the corridors under the Preferred Alternative would be conditionally compatible with aviation overflights.

### Long-term Impacts Related to Base Security

Because the Preferred Alternative crosses Base property, the operation of the FTC-S corridors would potentially provide an opportunity for unauthorized access to the Base from the corridor right-of-way. Maintaining the integrity of the existing security at Camp Pendleton is necessary to protect the training missions and assets on the Base. Because of the creation of the opportunity for unauthorized access to the Base, the operation of the Preferred Alternative will result in the potential for adverse impacts on Base security.

The Preferred Alternative includes reconfiguration of the MCB Camp Pendleton access gate at Basilone Road and associated realignment of Toby's Road. Toby's Road will pass under the realigned Basilone Road via an arch culvert. Toby's Road will not only provide access to the military training area in the former agricultural fields, but it will be extended to provide a new access along the southern abutment of the San Mateo Creek. Caltrans and MCB Camp Pendleton will share this new access, which will connect to the old Pacific Coast Highway. This access road will also provide access for MCB Camp Pendleton personnel between one side of I-5 to the other in this area.

A Caltrans maintenance access road will be provided from the I-5 shoulder to an extended detention basin located south of San Onofre Creek. MCB Camp Pendleton access will be maintained on the existing military access road while a new fence and gate will ensure that MCB Camp Pendleton has access to the remaining, existing percolation ponds on the Base.

The long-term impact of the reconfigured gate entrance will be to enhance Base security. The Preferred Alternative has a beneficial impact on Base security by including improvements that implement new Homeland Security requirements.

## 2.16.4 MITIGATION

The following mitigation measures apply to the Preferred Alternative within MCB Camp Pendleton, including the portion of the project that is within the Coastal Zone. The measures are also included in the Mitigation Monitoring and Reporting Program in Appendix A of this document.

**M-1** **Nighttime Lighting and Shielding.** During construction of the SOCTIIP build Alternatives on or in the immediate vicinity of Camp Pendleton, to minimize conflicts with night training by Base personnel, the following will be implemented:

- Construction lighting requirements during evening and night activities will be adjusted with proper shielding to focus illumination downward in designated work areas. To accomplish this, lighting fixtures will be fitted and hooded to minimize the spillage of light in an upward direction and on adjacent properties. Lighting will be designed to use the latest style of lighting (known as "mused lighting") to reduce the impact on night vision goggle training activities.
- Fixed lighting will not exceed the minimum needed to meet Caltrans standards. Lighting will be shrouded to reduce backscatter and vertical light pollution and will be of a type to minimize effects on adaptation to darkness and changes in light levels.
- A design review memoranda will be produced by the Contractor indicating that lighting design and materials used to minimize light and glare during construction are consistent with the requirements of this mitigation measure.
- Cranes that would remain extended to a height of 12.2 m (40 ft) above ground level (AGL) or higher during nighttime hours must include the use of a Federal Aviation Administration (FAA) approved aircraft obstruction light mounted at the highest point of the equipment's extension AGL. The aircraft obstruction light must be operational from 30 minutes before sunset until 30 minutes after sunrise each day the equipment is in place and extended above 12.2 m (40 ft) AGL overnight.

**M-2** **Access and Coordination.** Construction activities and equipment movement could adversely impact the movement of troops and use of ranges during construction. These impacts will be mitigated by coordination among the TCA, the Contractor, and Camp Pendleton personnel. Specifically, the Contractor will identify access routes, staging areas, and all expected movement corridors during construction and will produce a design review memoranda/ exhibit. These will be reviewed with the TCA and Camp Pendleton personnel to ensure that construction activity impacts on Base training are minimized.

**M-3** **Base Security During Construction.** For any corridor alignment that traverses or is in the immediate vicinity of Camp Pendleton, prior to final design, security measures shall be incorporated into the project construction specifications to ensure that construction workers and others cannot access the Base from the construction areas. These security measures shall be designed in consultation with Camp Pendleton and shall be in the form of physical barriers, including but not limited to walls and fencing. These security measures shall be implemented prior to any project-related construction and shall be adequately maintained throughout the construction period.

**M-4** **Nighttime Lighting and Shielding.** During operation of a SOCTIIP build Alternative on or immediately adjacent to Camp Pendleton, to minimize conflicts with night training by Base personnel, permanent night lighting will be adjusted with proper shielding to focus illumination downward. Lighting fixtures will be fitted and hooded to minimize the spillage of light in an upward direction and on adjacent properties, including the Base. Lighting will be designed to use the latest style of lighting (known as "mused lighting") to further minimize

potential glare effects on the Base. This design will be implemented at all places on and adjacent to the Base requiring lighting along the road, including interchanges and the mainline. To reduce the impact on night vision goggle training activities, fixed lighting on and immediately adjacent to the Base will not exceed the minimum needed to meet Caltrans standards. Lighting on and immediately adjacent to the Base will be shrouded to reduce backscatter and vertical light pollution and should be of a type to minimize effects on adaptation to darkness and changes in light levels.

A design review memorandum will be produced by the Contractor indicating that lighting design and materials used to minimize light and glare during operation on and immediately adjacent to the Base are consistent with the requirements of this mitigation measure.

**M-5** **Land Use Fragmentation/Ground Training.** To reduce impacts associated with the fragmentation of land available on Camp Pendleton and to avoid creating a parcel on the Base fully fragmented and inaccessible from the rest of the Base, two underpasses will be constructed to provide clearance for military personnel and equipment movement. The underpasses will be sized and designed to accommodate the equipment and personnel needs as may be defined by the Marine Corps and the DON.

**M-6** **Base Security.** For any corridor alignment that traverses or is immediately adjacent to Camp Pendleton, prior to final design, security measures shall be incorporated into the project design to ensure that users of the corridor cannot access the Base. These measures shall be designed in consultation with Camp Pendleton and shall be in the form of physical barriers, including but not limited to walls and fencing. These security measures shall be implemented and fully operable prior to public access to the corridor.

## 2.16.5 CONCLUSION

The Preferred Alternative alignment in the Coastal Zone is consistent with the alignment identified by MCB Camp Pendleton as the only acceptable alternative. Therefore, while the proposed project adversely affects the MCB due to the loss of land available for training purposes, the impact is not considered to be significant.

# 2.17 MINERAL RESOURCES

## 2.17.1 INTRODUCTION

The potential impacts of the various project Alternatives on mineral resources are evaluated in detail in the Geotechnical, Geology and Soils Technical Report (GeoPentech, Inc., 2003) and are summarized in Section 4.22 of the Final SEIR. The mineral resources of concern include metals, industrial minerals (e.g., aggregate, sand and gravel), oil and gas, and geothermal resources that would be of value to the region and residents of the State of California.

## 2.17.2 SETTING

### Study Area Setting

**Rock Aggregates.** The alluvial sand and gravel deposits in San Juan Creek have been mined for construction aggregate materials in the vicinity where the alignments of the SOCTIIP build Alternatives cross San Juan Creek.

**Petroleum.** Petroleum exploration in the general area of the project build Alternatives continued as late as the 1950s, as described by the California Division of Mines and Geology (CDMG, 1974). Two abandoned oil fields are within or near the project study area: (1) the San Clemente field, immediately east of the A7C-FEC-M/Preferred Alternative north of Avenida Pico, and (2) the Cristianitos Creek field, west of the San Diego/Orange County boundary and south of the present eastern terminus of Avenida La Pata. No production was recorded from these fields, although CDMG (1974) indicated that good possibilities for productive wells may exist in these and adjacent areas from structural traps associated with the Cristianitos and Mission Viejo Faults.

**Silica Sand.** Owens-Illinois (now Oglebay Norton Industrial Sand) has produced silica sand from the lower beds of the Santiago Formation in Trampas Canyon, south of Ortega Highway, and north of the Talega Development.

**Clay.** There are past clay mining excavations, prospecting pits, and short tunnel excavations in the Claymont Clay bed of the Silverado Formation, and north of the Talega Development.

**Expanded Aggregate.** Lightweight aggregate was produced in the 1960s from the Capistrano Formation, on the west side of the Prima Deshecha Landfill, approximately 3.2 kilometers (2 miles) west of the FTC-S Preferred Alternative.

### Coastal Zone Setting

There are no known mineral resources in the Coastal Zone that will be affected by implementation of the proposed project (Preferred Alternative). The nearest identified mineral resource—the abandoned Cristianitos Creek oil field—is located approximately 2 miles from the Coastal Zone boundary.

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton (San Onofre Gate) in order to comply with new Homeland Security requirements. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.17.3 IMPACTS

### Project Impacts

Loss of access, deposits covered by changed land use, zoning restrictions, and the project's potential impact on the environment related to the project Alternatives were evaluated relative to the potential for the environment to adversely impact the proposed project.

The Final SEIR did not identify any impacts to mineral resources associated with loss of access or zoning restrictions for any of the build Alternatives. The Final SEIR found that the Preferred Alternative would cross near the existing Olgebay Norton quarry operations in Trampas Canyon. Based on discussions with Olgebay Norton staff, it is unlikely that the project would adversely impact its operations, which are permitted through 2013. Quarry operations could continue beyond 2013 if the existing lease from the property owners (RMV) is extended or a new lease is granted. Additional sand resources have not been investigated and proven. As a result, project construction is not considered an impact to the available mineral resource.

### Impacts in Coastal Zone

There are no known mineral resources within the project impact area of the Coastal Zone. The nearest identified mineral resource—the abandoned Cristianitos Creek oil field—is located approximately 2 miles from the Coastal Zone boundary. Project implementation is not considered to be an impact to mineral resources in the Coastal Zone.

## 2.17.4 MITIGATION

Mitigation measures were provided in the Mitigation Monitoring Program (MMP) for Final Environmental Impact Report No. 3 (EIR No. 3) for the Foothill Transportation Corridor – Oso Parkway to Interstate 5 to minimize the impacts to mineral resources identified for the alignments analyzed in that EIR. All the mitigation measures in the MMP for EIR No. 3 were reviewed and have been incorporated, as applicable, in the mitigation measures for the SOCTIIP alternatives. Measure 43 from EIR No. 3 was incorporated into Mitigation Measure SE-2 for SOCTIIP (listed below and in the Mitigation Monitoring and Reporting Program included as Appendix A of this document).

**SE-2** **Property Acquisition and Relocation Assistance.** Prior to acquisition of right-of-way, the TCA will comply with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 in the acquisition of all property within the right-of-way necessary for the proposed project. All displaced households and businesses will be contacted to ensure that each eligible displacee receives full relocation benefits, including advisory assistance, and that all activities will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources will be available to all eligible displaced persons or businesses without discrimination. TCA will also comply with the Public Park Preservation Act, as applicable.

## 2.17.5 CONCLUSION

Potential impacts to mineral resources are less than significant. Implementation of Mitigation Measure SE-2 ensures that any potential impacts to mineral extraction operations are reduced to a less than significant impact.

There are no known mineral resources in the Coastal Zone, and no impacts related to mineral resources in the Coastal Zone have been identified in relation to the Preferred Alternative.

# 2.18 PALEONTOLOGICAL RESOURCES

## 2.18.1 INTRODUCTION

LSA conducted a paleontological resource assessment for the portion of the Preferred Alternative that is within the Coastal Commission Coastal Zone Boundary (Coastal Zone) within the Marine Corps Base (MCB) Camp Pendleton (Camp Pendleton). The South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) involves construction of transportation improvements in the south Orange County and north San Diego County area. The Camp Pendleton segment of the project specifically is concerned with the southern extension of the existing State Route 241 (SR-241). At the time of the field survey, all the proposed route alternatives within San Diego County, the Far East Corridor-W (FEC-W), the Far East Corridor-Modified (FEC-M), and the Alignment 7 Corridor-Far East Crossover (A7 FEC) Alternatives followed a common alignment. All these alignments are located on the hills on the west side of the San Mateo/Cristianitos Creek channel and roughly parallel the Orange County and San Diego County line. The Preferred Alternative follows approximately the same route as the three previous alternatives, with minor modifications. The Area of Direct Impact (ADI) (or disturbance limits [DL]) for this segment is almost entirely within San Diego County. A very small portion of the ADI extends into Orange County northeast of San Clemente. The southern terminus of the San Diego segment is Interstate 5 (I-5), and the northern terminus is located approximately 4.5 miles to the north, where the Orange County/San Diego County line begins to run west to east.

The project proposes two lanes in each direction. Based on the underlying topography, the width of the area impacted by the footprint of the road will vary between approximately 600 ft to just over 1,000 ft. In addition, improvements will be made to the I-5 interchange that includes widening the freeway to construct connector roads. The I-5 improvements will occur in an area between San Mateo Creek on the west and from 1.1 to 1.4 miles southeast of Basilone Road on the east.

The Coastal Zone ADI consists of approximately 134 acres and is located within portions of Sections 10, 11, 13, 14, 15, 23, and 24 in Township 9 South, Range 7 West. The project area is depicted on the United States Geological Survey (USGS) *San Clemente, California* 7.5-minute topographic quadrangle map (Figure 2.18-1).

The paleontological resources assessment was completed pursuant to California Environmental Quality Act (CEQA) Appendix G (as amended December 1, 2006), the California Public Resources Code (PRC) 5097.5, and in accordance with guidelines developed by the Society of Vertebrate Paleontologists (SVP, 1995) and the County of San Diego (Department of Planning and Land Use, 2006).

Potential impacts to paleontological resources are evaluated in detail in the SOCTIIP Paleontological Resources Technical Report (SWCA Environmental Consultants, 2003), and are summarized in Section 4.23 of the Final SEIR.

LSA

FIGURE 2.18-1

Coastal Zone Boundary

County Boundary

San Onofre State Park leasehold subunits*

Preferred Alternative (11/26/06) - 138.75 ac within the Coastal Zone

Previous Alternative (11/9/05)

SOURCE: EagleAerial (4/2006); CDMG (11/29/06); CCC (2005) * Boundaries are considered as estimates

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*Foothill Transportation Corridor - South*

Preferred Alternative within the Coastal Zone

## 2.18.2 SETTING

### Regulatory Setting

Paleontological resources, or fossils, are the remains (such as bones, teeth, shells, leaves, or wood) and/or traces (such as tracks or burrows) of prehistoric animal and plant life. Generally, for something to be considered a fossil it must be at least 10,000 years old. Fossils provide direct evidence of ancient organisms and can document the patterns of organic evolution and extinction. In California, impacts to paleontological resources are addressed through the environmental review process pursuant to CEQA.

Paleontological remains are recognized as nonrenewable resources significant to our culture. A 1978 memorandum from Griswold E. Petty, the then Acting Associate Director of the Bureau of Land Management, stated:

> "There is no universally accepted definition for a significant scientific paleontological resource. A definite determination can only be made by a qualified, trained paleontologist. Using the following guidelines, a paleontological resource is of significant scientific and educational value if it:
>
> - provides important information of the evolutionary trends among organisms, relating living inhabitants of the earth to extinct organisms;
> - provides important information regarding development of biological communities or interaction between botanical and zoological biotas;
> - demonstrates unusual or spectacular circumstances in the history of life; and
> - Is in short supply and in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and is not found in other geographic locations.
> - *All vertebrate fossils have been categorized as being of significant scientific value"* (emphasis added).

Significant paleontological resources are fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically or stratigraphically important and those that add to an existing body of knowledge in specific areas stratigraphically, taxonomically, or regionally. They include fossil remains of large to very small aquatic and terrestrial vertebrates, remains of plants and animals previously not represented in certain portions of the stratigraphy, and assemblages of fossils that might aid stratigraphic correlations, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, paleoclimatology, and the relationships of aquatic and terrestrial species.

Paleontological resources can be thought of as including not just the fossil remains themselves but also the individual localities where those fossils are collected, and in a broader sense, the geologic formations or sedimentary units containing the fossils and localities. The relationship between geologic formations/units and the fossils that they can contain can be important for planning purposes because knowledge of the geology of a particular area makes it possible to predict where fossils may (or may not) be encountered. This relationship is known as paleontological sensitivity, which can range from none to high. A list of sensitivities for all formations and units within the San Diego area

is contained in Deméré and Walsh (1993) and is also explained in more detail below. Thus, in the early planning stages of a project, an assessment can quickly and uniformly be developed, and if necessary, mitigation measures developed to reduce impacts to paleontological resources within the project.

### State Regulations

Under CEQA, Appendix G, lead agencies are required to consider impacts to the direct or indirect destruction of unique resources that are of value to the region or State. This section of CEQA is a checklist with several choices given, including: Potentially Significant Impact; Less Than Significant with Mitigation Incorporation; Less Than Significant Impact; and No Impact. Specifically, in Appendix G, Section V(c), lead agencies are required to consider impacts to paleontological resources.

California PRC Section 5097.5, states:

> "(a) No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.
>
> (b) As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof."

### Policies and Guidelines

The Conservation Element (Part X) of the County of San Diego General Plan (San Diego County, 1993) was developed to identify and describe the natural resources of San Diego County and prepare policies and action programs to conserve these resources. Chapter 5 of Part X deals with minerals, and under the heading Unique Geologic Features states:

> "One of San Diego County's major assets is the three distinctive geographic provinces. These provinces from west to east are the Coastal Plain, Interior Upland of Ranges and Valleys (Peninsular Range Province), and the Salton (Imperial) Basin. Each province has a particular association of climate, topography, flora and fauna, and geologic setting. Within each province there are geologic features which are not only different from those found in the other provinces but are unique to their own province. In many cases these features are unique to California and the rest of the nation. What makes a geologic feature unique varies considerably. A unique feature may be the best example of its kind locally or regionally, it may illustrate a geologic principle, it may provide a key piece of geologic information, it may by the 'Type locality' of a fossil or formation, or it may have high aesthetic appeal. Unique geologic features may be exposed or created from natural weathering and erosion processes or from man-made excavations.

Saving all unique geologic features is impossible because they are often very small or very large, are widely scattered or are on private property."

The County General Plan includes the following findings regarding geologic features:

**Finding 26.** The Natural Resources Inventory (NRI) of San Diego County identified 67 unique geologic features (County of San Diego, no date). This preliminary list (see Appendix G) includes stratigraphic formations, igneous rocks, fossil locations, and structural features.

**Finding 27.** The County does not have an active program for the identification and preservation of unique geologic features.

**Policies and Action Programs Policy 8.** The County will, to the extent practical, protect and preserve unique geological features from destruction, damage, or loss.

**Action Program 8.1:** Maintain a mapping program to identify unique geological features. These features will include geologic formations, fossil localities, structural features, and landforms. Upon completion of the mapping, the Planning Department will initiate a program to protect significant and unique geologic features.

### County-Specific Purpose

The *Draft Guidelines for Determining Significance for Paleontological Resources* ([Guidelines] Department of Land Use and Planning, 2006) was developed by the San Diego Department of Land Use and Planning with input from several area paleontologists, including: Thomas A. Deméré, PhD, Curator of Paleontology and Director of the Department of Paleo Services, San Diego Natural History Museum; George L. Kennedy, PhD, Senior Paleontologist, Brian F. Smith and Associates; and John A. Minch, PhD, Principal, John Minch and Associates. This Draft document was sent out for public review between January 11, 2006, and February 9, 2007.

The information presented in the Guidelines was developed to be used by County staff for the review of discretionary projects and environmental documents pursuant to CEQA. The Guidelines present a range of quantitative, qualitative, and performance levels for particular environmental effects. Normally (in the absence of substantial evidence to the contrary), noncompliance with a particular standard stated in these Guidelines will mean the project will result in a significant effect, whereas compliance will normally mean the effect will be determined to be "less than significant."

The intent of these Guidelines is to provide a consistent, objective, and predictable evaluation of significant effects. These Guidelines are not binding on any decision maker and do not substitute for the use of independent judgment to determine significance or the evaluation of evidence in the record.

## Society of Vertebrate Paleontologists

The SVP is a national organization of professional vertebrate paleontologists. One of the objectives of the SVP is to advance the science of vertebrate paleontology and facilitate the cooperation of all persons concerned and involved in the study and collection of vertebrate fossils. The SVP believes that vertebrate fossils are significant nonrenewable resources that are afforded protection by federal, State, and local environmental laws and guidelines. In 1995 the SVP developed a standard set of guidelines that outline acceptable professional practices to be implemented for paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, specimen preparation, analysis, and curation (SVP, 1995).

The assessment and survey section details how the paleontological sensitivities are established, from high to low to undetermined, and is spelled out in more detail below. The remainder deals with developing a standard and uniform set of guidelines that can be implemented to mitigate adverse impacts to paleontological resources. This is often called a Paleontological Resources Impact Mitigation Program (PRIMP). Typically, a PRIMP consists of monitoring for paleontological resources during excavation operations and the collection and recovery of any significant resources that are observed. Recovered resources are then prepared, identified, and curated at an appropriate institution, where they are available for immediate and future paleontological study and can be displayed for public viewing.

## Paleontological Sensitivity

Planners and paleontologists work together to help preserve the County's fossil heritage during the environmental review process by using a system to determine the potential for the occurrence of fossils. At the early stages of development, a paleontological assessment can be conducted to determine the level of paleontological sensitivity for a project.

According to the SVP, sensitivity ratings are either high, low, or undetermined (SVP, 1995). Sedimentary rock units with high potential for containing significant nonrenewable paleontological resources are rock units within which vertebrate or significant invertebrate fossils have been determined to be present or are likely to be present. Rock units with a low potential for containing significant nonrenewable paleontological resources are units within which vertebrate or significant invertebrate fossils have been determined not to be present or not likely to be present. Areas underlain by sedimentary rocks for which literature and unpublished studies are not available have undetermined potential for containing significant paleontological resources.

Sensitivities for geologic formations/units within the County are more detailed than the SVP sensitivities and are specifically dependent fossils that have (or have not) been recovered from each formation/unit within the County. The sensitivities for each of the geologic formations/units in San Diego are included in a report prepared for the San Diego Planning Commission on the Paleontological Resources of San Diego County (Deméré and Walsh, 1993). The rating system includes high, moderate, low, marginal, and zero, and each is detailed below.

- **High:** Geologic formations known to contain paleontological localities with rare, well-preserved, and/or critical fossil materials for stratigraphic or paleoenvironmental interpretation and fossils providing important information about the paleobiology and phylogeny (evolutionary history) of animal and plant groups. Generally speaking, highly sensitive formations are known to produce vertebrate fossil remains or are considered to have the potential to produce such remains.
- **Moderate:** Geologic formations known to contain paleontological localities with moderately preserved common elsewhere, or stratigraphically long-ranging fossil material. The moderate sensitivity category is also applied to geologic formations that are judged to have a strong but unproven potential for producing important fossil remains (e.g., Pre-Holocene sedimentary rock units representing low to moderate energy, marine to nonmarine depositional settings).
- **Low:** Geologic formations that, based on their relatively recent formation or high-energy depositional history, are judged unlikely to produce important fossil remains. Low-sensitivity formations may produce a low abundance of invertebrate fossil remains.
- **Marginal:** Geologic formations that are composed of pyroclastic volcanic rocks or metasedimentary rocks, but which nevertheless have a limited potential to yield fossil remains from certain sedimentary lithologies at localized outcrops.
- **Zero:** Geologic formations that are entirely plutonic in origin and therefore have no potential for producing fossil remains.

### Locality Search

A paleontological locality search was conducted at the San Diego Natural History Museum (SDNHM). This included a review of area geology and any fossil resources recovered within 0.5-mile of the project's ADI. In addition, the sensitivity of the sediments exposed within the project area to produce fossil remains was determined based on fossil finds from similar sediments in the southern California area. LSA also examined the NRI of the County as attached in the County General Plan, Part X–Appendix G (County of San Diego, 1993).

The purpose of the search was to establish the status and extent of previously recorded paleontological and geological resources within and adjacent to the project area and to determine which geologic sediments were likely to be exposed during ground-disturbing activities. With this knowledge, LSA could make an informed assessment of the potential effects of the proposed project on paleontological and geological resources, anticipate the kinds of resources that might be encountered during earth-moving activities, and determine the paleontological sensitivities for each geologic formation or unit exposed in the project area.

### Field Survey

A reconnaissance-level pedestrian field survey of the project area was conducted by LSA between March 17 and 23, 2005 (Fulton, Mclean, Smith, and Strudwick, 2006) The survey was conducted by walking parallel transects spaced approximately 10 meters (m) apart over all areas where ground surface was visible until the entire project area had been surveyed. Back dirt from animal burrows was also examined for evidence of paleontological remains.

Although the primary purpose of this survey was to identify cultural resources, surveyors were instructed to also survey for paleontological remains that might also be impacted by the project. In this way, LSA could document and collect paleontological material prior to the beginning of ground-disturbing activities and locate areas within the project that might contain abundant remains. In addition, the geology as mapped by Tan (1999) could be verified.

If any resources were located in situ, the surveyors were prepared to assess the finds for significance and, if necessary, document them. If the find was deemed to be significant, the surveyor was instructed to note its location with a Garmin global positioning system (GPS) unit. The use of GPS units allows localities to be quickly and accurately plotted on a standard 7.5′ topographical map, as well as be easily relocated. The surveyor was also instructed to fill out a fossil locality sheet that contains important information such as field number of the locality, tentative identification of the find, description of the sediments, formation name, location of the find within the project, GPS information, and elevation.

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

Paleontological resources surveys were conducted for the entire area within the modified disturbance limits.

## 2.18.3 IMPACTS

### Locality Search

**Geology.** The project is located on the western flank of the Peninsular Ranges geomorphic province. This region is characterized by a series of northwesterly trending mountain ranges separated by northwesterly trending valleys and subparallel faults branching from the San Andreas Fault. These ranges are essentially a series of fault-bounded blocks that dip gently to the west and have a steep eastern escarpment. The Peninsular Ranges extend from the tip of Baja California to the Transverse Range north of the Los Angeles Basin. The width of the Province varies from 48 to 362 km (30 to 225 miles), with a maximum landbound width of 105 km (65 miles) (Sharp 1976). The Los Angeles Basin and the island group (Santa Catalina, Santa Barbara, and the distinctly terraced San Clemente and San Nicolas Islands), together with the surrounding continental shelf (cut by deep submarine fault troughs), are included in this province (California Geologic Survey 2002). The rocks of the Peninsular Ranges are typically composed of Jurassic-age metasedimentary and metavolcanic as well as Cretaceous-age igneous rocks of the Southern California batholith. These older rock units are, in

turn, capped by limited exposures of Cretaceous to recent marine and terrestrial sedimentary deposits composed of every sedimentary rock type from clay, silt, sand, gravel, and cobbles. The primary sediment source for the geologic formations in this province is the uplifted Southern California batholith.

Specifically, the project area is located at the confluence of several mountain ranges in the Peninsular Ranges geomorphic province. The Santa Ana Mountains are located to the north and northeast, and the Santa Margarita and San Onofre Mountains are located to the east at the southern end of the project. Changes in sea level combined with tectonic uplift caused by movement along various faults have produced several elevated marine terraces located on the mountains that flank the coast. Byrd (1998) cites studies that indicate that uplift has averaged 10–40 cm/1,000 years and that uplift along the San Diego coast has been measured between 16 and 20 cm/1,000 years. Recent work by Grant et al. (1999) calculated an uplift rate of 21–27 cm/1,000 years within the San Joaquin Hills, located 29 km (18 miles) up the coast from where San Mateo Creek enters the ocean. The majority of the project area is located along some of these younger coastal marine terraces, but it also crossed both San Onofre and San Mateo Creeks, which drain large watershed basins in the local mountains.

One geologic formation and several nonformational geologic units are exposed within the proposed SOCTIIP alignment in the Coastal Zone. The bedrock formation is the Miocene- to Pliocene-aged San Mateo Formation. The nonformational units include, from oldest to youngest, 413,000 to 450,000 year old, 120,000 to 413,000 year old, 120,000 year old, and 80,000 year old marine terrace deposits, recent nonmarine terrace deposits, and recent alluvium (Tan, 1999). Although not mapped, Holocene colluvium and recent artificial fill are known to be present within the project area. Each of these units is described in more detail below.

**San Mateo Formation (Tsm).** The San Mateo Formation was first described by Woodford (1925) in the vicinity of the project area. It is a nearshore marine sequence composed chiefly of light brown to grey sandstones and cobble conglomerates, and also interbedded siltstones and claystones. It is late Pliocene to late Miocene in age (approximately 2–7 Ma). It is sometimes referred to as the Turbidite Facies of the Capistrano Formation. It is generally loosely consolidated, poorly cemented, and subject to landslides. It is mapped by Tan (1999) as occurring on the northern, southern, and central portions of the project. It is also located below sediments mapped as older marine terrace deposits, and thus may be encountered within deeper excavations where older marine terrace deposits are mapped.

**Older Marine Terrace Deposits ($Qomt_7$, $Qomt_6$, $Qomt_{2-6}$, and $Qomt_{1-2}$).** Coastal San Diego County is characterized by a "stair-step" sequence of elevated Pleistocene-age marine terraces (uplifted sea floors) and their associated marine and nonmarine sedimentary covers (Kern 1977; Kern and Rockwell 1992). These deposits are found on the coastal-facing mountains at elevations that can be several hundred feet above sea level. The sediments in these terraces consist of light brown to orange brown, and yellow brown to gray mixtures of sands, gravels, and pebbles with some minor silt. The sand grains tend to be subangular to subrounded, while the gravels and pebbles are generally subrounded to rounded, with occasional angular clasts derived from the underlying formation. Bedding is usually poor; however, lenticular beds and cross-bedding do occur. The deposits tend to be friable to weakly indurated. Sand grains are predominantly quartz

and feldspar, while the gravels are quite variable: plutonics, volcanics, metamorphics, and fragments of the underlying, or nearby, bedrock formations.

Within the project area four marine terraces are mapped. The Bird Rock Terrace ($Qomt_7$) is located near the mouth of San Onofre Creek, has been dated to approximately 80,000 years, and occurs at an elevation of 20–40 feet above mean sea level (amsl). The Nestor Terrace ($Qomt_6$) has been dated at 120,000 years and occurs at the northern and southern ends of the project, and near the middle of the project area at Basilone Road at elevations from 75 to 85 feet amsl. Another ($Qomt_{2-6}$) has been dated to between 120,000 to 413,000 years old and occurs at the northern and southern ends of the project and near the middle of the project area at Basilone Road at elevations from 85 to 125 feet amsl. The fourth corresponds to the Parry Grove and Golf Course Terraces ($Qomt_{1-2}$) and has been dated between 423,000 to 450,000 years old; it is located at the far northern end of the project area at elevations between 125 to 190 feet amsl.

**Holocene Stream Terrace Deposits.** The Holocene stream terrace deposits, also called young alluvial deposits (Qya), represent the remnants of abandoned floodplains, stream beds, or valley/canyon floors produced during an earlier stage of deposition. These deposits can consist of interbedded silt, clayey sand, and conglomeratic coarse-grained sands. The sand grains are generally subangular to subrounded, while the gravels and cobbles are rounded to well-rounded. Although these stream terrace deposits can be older than the Holocene, within the project area they are mapped as being younger than 10,000 years old. As mapped by Tan (1999), these deposits are located to the south of the active stream channels of both San Mateo and San Onofre Creeks.

**Holocene Alluvium.** Holocene alluvium, also called Quaternary Wash deposits (Qw), is a geologically recent deposit of gravel, sand, silt, or mud that was deposited by flowing water in a stream or river. It is found along old and active stream and river drainages and is usually loosely consolidated. It is usually light grey to light yellow in color. The sand grains are generally subangular to subrounded, while the gravels and cobbles are rounded to well-rounded. As mapped by Tan (1999), Qw represents the active stream channel and occurs in a restricted, narrow area where both San Mateo and San Onofre Creeks are located.

**Holocene Colluvium.** Holocene colluvium is a geologically recent deposit of gravel, sand, silt, or mud that is usually found on the sides or at the base of slopes or cliffs. These deposits are generally thin, loosely consolidated, and were primarily deposited by gravity. Therefore, the sediments in colluvium generally did not travel far from their source and are chiefly composed of detritus of the nearby or underlying bedrock formations. As mentioned before, Tan (1999) does not include this unit on his map, but it is known to occur as a thin veneer on many of the slopes in the project area.

**Artificial Fill.** Artificial fill is soil/dirt that is placed by humans and can be either unconsolidated or loosely compacted, or engineered and densely compacted. Composition varies and is dependent on the source. It is often mixed with modern debris such as bricks, concrete, asphalt, glass, or wood. Depending on the area, thickness can be 1 foot or less to several hundred feet.

Although not mapped by Tan (1999), artificial fill occurs throughout the project area, most prominently where the I-5 crosses the San Mateo drainage.

**Paleontology.** The results of the locality search indicate that no paleontological resource have been found within the project area or within the 0.5-mile search radius. However, a review of the geologic and paleontologic literature suggests that sediments within the project area will likely contain paleontological resources. According to Deméré and Walsh (1993), sediments mapped as the San Mateo Formation have a high sensitivity for containing paleontological remains; the older marine terrace deposits have a moderate to high sensitivity for containing paleontological resources; and the young stream terrace deposits, the recent alluvium, and the colluvium have a low sensitivity for containing paleontological resources (see below). Based on the literature search, the SDNHM believes that a PRIMP should be implemented for all ground-disturbing activities near sediments with sensitive ratings.

Scientifically significant specimens of fossil ray, shark, bony fish (Fierstine and Welton 1988), sea bird (Howard 1982), dolphin, sperm whale, baleen whale (Barnes 1976; Barnes et al. 1981), sea cow (Domning and Deméré 1984), fur seal, walrus, and sea otter (Berta and Morgan 1985) have been recovered from the San Mateo Formation. Exposures of the San Mateo Formation on MCB Camp Pendleton have produced diverse assemblages of marine invertebrates (e.g., clams, scallops, snails, and sea urchins; Deméré and Walsh, 1993). Terrestrial mammal remains (e.g., horse, camel, llama, and peccary; Deméré and Walsh, 1993) have also been recovered. For this reason the San Mateo Formation has been assigned a high paleontological resource sensitivity (Deméré and Walsh, 1993).

Older marine terrace deposits throughout this region have the potential to yield scientifically significant specimens of marine invertebrates such as mollusks, crustaceans, and echinoids (Stephens, 1929; Grant and Gale, 1931; Emerson and Chase, 1959; Valentine, 1960, 1961; Kern, 1977), as well as sparse remains of marine vertebrates such as sharks, rays, and bony fish (Jefferson, 1991). On occasion, remains of terrestrial mammals such as camel, horse, and mammoth (Hertlein and Grant 1944) are recovered from older marine terrace deposits. Older marine terrace deposits are generally assigned a moderate to high paleontological resource potential (Deméré and Walsh, 1993).

Both the Holocene alluvium and colluvium are generally too young (less than 10,000 years) to contain in situ fossil remains. If conditions are just right, however, remains may be fossilized in less than 10,000 years. Occasionally, fossils from upstream formations or the underlying bedrock from which they originated are encountered. However, these remains are generally not considered significant since they are not in their original context.

Although artificial fill can contain fossils, they are not considered significant, as they are no longer in their original context within the geologic record.

**Natural Resources Inventory.** An examination of the NRI indicates that the San Mateo Formation is one of the 67 listed Unique Geologic Features that have been recorded within the County. The location for this is given as "Along San Mateo Creek," which is within the project area. although not stated in the nri, the probable reason this formation is being listed at this

location is because this is where Woodford (1925) first described the formation and its sediments, thus making it the formation's "Type Location."

**Paleontological Sensitivities.** The paleontological sensitivities for each of the units that are expected to be encountered during ground-disturbing activities within the project area are depicted on Figure 2.18-2 and listed in Table 2.18-A. A brief reasoning for each sensitivity designation is also discussed below.

**Table 2.18-A: Paleontological Sensitivities of Units within the Project Area**

| Formation/Unit | Sensitivity* |
|---|---|
| San Mateo Formation | High |
| Marine Terrace Deposits ($Qomt_7$, $Qomt_{2-6}$, and $Qomt_{2-6}$) | Moderate to High |
| Young Stream Terrace Deposits (Qya) | Low |
| Holocene alluvium (Qw) and colluvium | Low |
| Artificial fill | — |

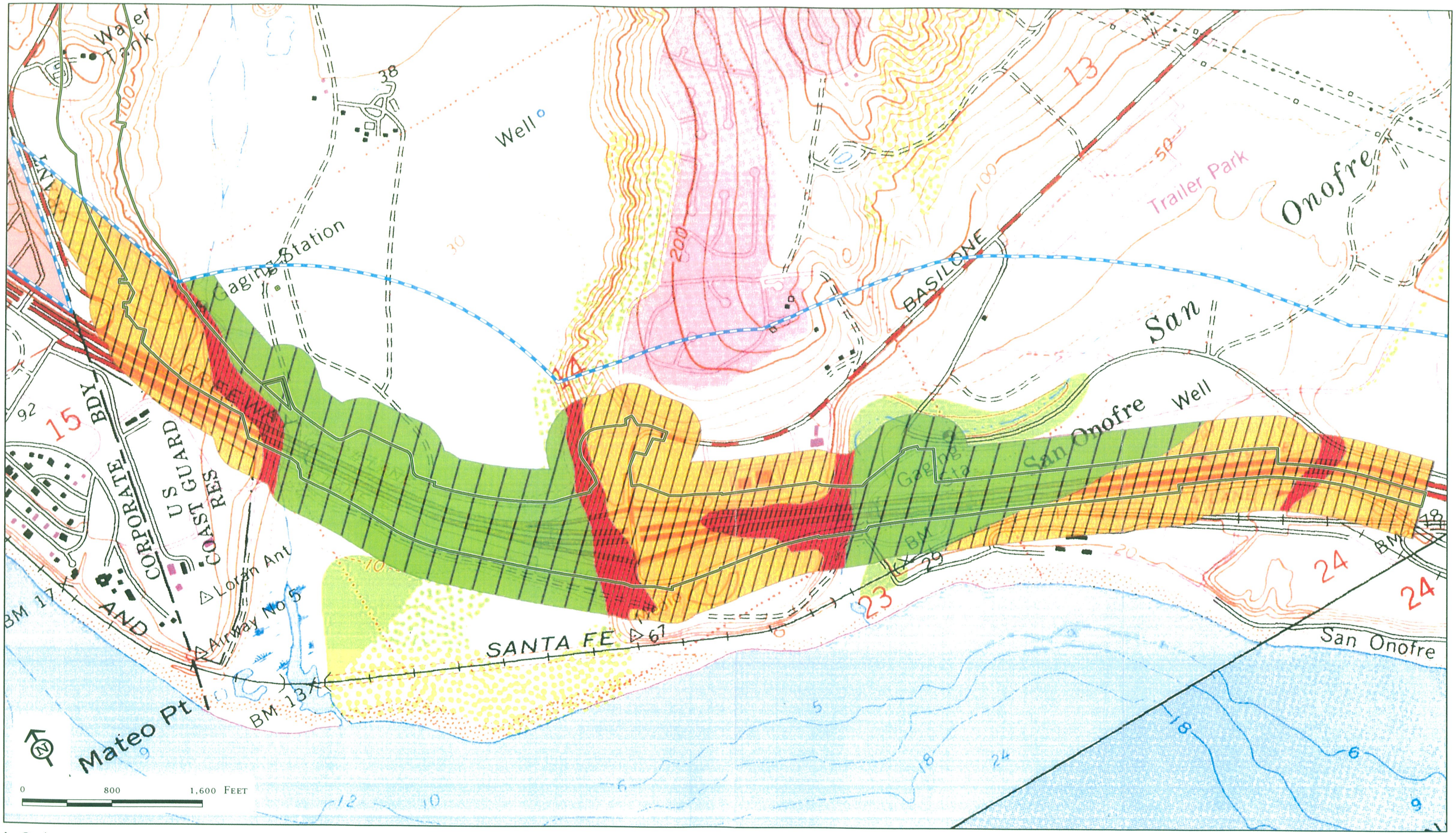
*Deméré and Walsh, 1993.

The San Mateo Formation (Tsm) has a well-documented history for producing significant and diverse invertebrate and vertebrate paleontological remains: Fierstine and Welton (1988); Howard (1982); Barnes (1976); Barnes et al. (1981); Domning and Deméré (1984); Berta and Morgan (1985); and Deméré and Walsh (1993). In addition, this Formation is listed in the NRI of San Diego as a unique geologic feature, with the type location listed as the San Mateo Drainage (County of San Diego, 1993). As such, Deméré and Walsh (1993) consider the San Mateo Formation to have a high paleontological sensitivity.

The four mapped marine terrace deposits ($Qomt_7$, $Qomt_6$, $Qomt_{2-6}$, and $Qomt_{1-2}$) that occur within the project are aged between 80,000 to 450,000 years old. They have produced a diverse collection of marine invertebrates (Stephens, 1929; Grant and Gale, 1931; Emerson and Chase, 1959; Valentine, 1960, 1961; Kern, 1977), and occasional vertebrate remains (Jefferson, 1991 and Hertlein and Grant, 1944). Because the units can produce significant fossils, but only occasional vertebrate remains, and only occasionally rare invertebrate remains, they have been assigned a moderate to high sensitivity, rather then the full high sensitivity rating.

The Holocene alluvium (Qw) is restricted to two narrow areas within the active stream channels of both San Mateo and San Onofre Creeks (Tan, 1999), and slope wash deposits, although not mapped by Tan (1999), occur on some of the ungraded slopes Fossils are generally unknown from these deposits in San Diego County. Mainly based on their young age, these recent deposits in San Diego County are assigned a low paleontological resource sensitivity by Deméré and Walsh (1993).

Artificial fill is not mapped on the geology map prepared by Tan (1999). However, it is known to exist, especially in the area where the existing I-5 crosses San Mateo Creek. Artificial fill was not officially rated by Deméré and Walsh (1993). However, because it has been placed at its current location by humans, any fossils that may be in the fill matrix are out of context and would not be




LSA

FIGURE 2.18-2

Coastal Zone Boundary

Preferred Alternative (11/26/06)

Paleontological Sensitivity*

High Sensitivity

Medium to High Sensitivity

Low Sensitivity

SOURCE: USGS (1999, Version 1.0); USGS 1:24,000 Quads - San Onofre Bluff (1975), San Clemente (1975); CDMG (11/29/06); CCC (2005)

* Includes a 300' buffer from edge of proposed disturbance limit (Preferred Alternative)

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*Foothill Transportation Corridor - South*

Paleontological Sensitivities within the Coastal Zone portion of the SOCTIIP

scientifically important. Thus, artificial fill is not considered paleontologically sensitive, and mitigation monitoring is not required in these sediments.

### Field Survey

No paleontological resources were identified during the field survey. The survey of the project indicated that much of the ground surface has been disturbed by grading and other development associated with the I-5, military activities, and the San Onofre Nuclear Generating Station. The soil and sediment consisted of a mix of gravels, sands, silts, and clays. The geology as mapped by Tan (1999) appears to be accurate, although he did not include the colluvium that mantles the surface in some areas and did not include the artificial fill that underlies much of the existing I-5, especially where the I-5 crosses the San Mateo drainage.

## 2.18.4 MITIGATION

Mitigation measures for impacts related to paleontological resources included in the certified Final SEIR are included in the Mitigation Monitoring and Reporting Program in Appendix A and are listed below:

**P-1** **Pre-Construction Salvage.** Prior to the start of any earthmoving activity, an Orange County Certified (OCC) Paleontologist will be retained to conduct pregrading salvage of any significant exposed fossils identified by the OCC Paleontologist prior to any heavy equipment activity in a particular area. Paleontological monitoring of brush removal shall be performed by a qualified paleontologist, under the supervision of an OCC Paleontologist, to locate and salvage additional significant fossil remains not previously visible. The OCC Paleontologist shall prepare a paleontological technical report that includes methodology, results, and an inventory list of significant fossils recovered.

**P-2** **Monitoring Procedures.** Prior to the start of any earthmoving activity, an OCC Paleontologist shall be retained to establish procedures, following these mitigation guidelines set forth in this Paleontological Resources Technical Report, for paleontological resource monitoring by qualified paleontological monitors during grading, and procedures for temporarily halting or redirecting work to permit the sampling, identification and evaluation of the fossils as appropriate. The OCC Paleontologist shall also establish emergency procedures applicable to the discovery of unanticipated significant paleontological resources (e.g., large specimens or significant concentrations of specimens as determined by the OCC Paleontologist). The OCC Paleontologist shall be present at the pregrading conference to explain the established procedures to the construction contractors.

**P-3** **Construction Monitoring.** During all construction activities which involve soil disturbance, the following activities will be conducted:

a. An Orange County Certified Paleontologist will be retained to supervise monitoring of construction excavations and to produce a mitigation plan for the proposed project. Paleontological monitoring will include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. The monitor will have authority

to temporarily divert grading away from exposed fossils in order to recover the fossil specimens.

b. If microfossils are present, the monitor will collect matrix for processing. In order to expedite removal of fossiliferous matrix, the monitor may request heavy machinery assistance to move large quantities of matrix out of the path of construction to designated stockpile areas. Testing of stockpiles will consist of screen washing small samples (approximately 90 kilograms, or 200 pounds) to determine if significant fossils are present. Productive tests will result in screen washing of additional matrix from the stockpiles to a maximum of 2,700 kg (6,000 lbs) per locality to ensure recovery of a scientifically significant sample.

c. Younger Quaternary Alluvium, San Onofre Breccia and Quaternary Landslide Deposits have a low or indeterminate paleontological sensitivity level, and will be spot-checked in a periodic basis to insure that older underlying sediments are not being penetrated and fossils are not being exposed. All earth-moving in the Williams Formation, Silverado Formation, Santiago Formation, Sespe Formation, Vaqueros Formation, Sespe/Vaqueros Undifferentiated, Topanga Formation, Monterey Formation, Capistrano Formation, Niguel Formation, Older Quaternary Alluvium and Quaternary Marine and Non-Marine Terrace Deposits will be monitored full-time. The moderate to high paleontological sensitivity of these formations requires a maximum effort to recover fossils.

d. The Orange County Certified Paleontologist will prepare monthly progress reports to be filed with the client and the lead agencies.

e. Recovered fossils will be prepared to the point of curation, identified by qualified experts, listed in a database to allow analysis, and deposited in a designated repository such as a County of Orange facility, which shall have the first right-of-refusal of the collection, or the Natural History Museum of Los Angeles County or San Diego Natural History Museum.

f. At each fossil locality, field data forms will record the locality, stratigraphic columns will be measured and appropriate scientific samples submitted for analysis.

g. The Orange County Certified Paleontologist will prepare a final mitigation report to be filed with the client, the lead agencies, and the repository.

Although no paleontological resources were identified during the field survey, according to Deméré and Walsh (1993), sediments mapped within the project area have sensitivity ratings from high to low for containing paleontological resources. In addition, the San Mateo Formation is listed on the County's NRI as a unique geological feature, and thus is significant to the County. In order to mitigate potential adverse impacts to nonrenewable paleontological and geological resources in sediments with sensitivity ratings of medium and high, both the SDNHM and LSA recommend that a qualified paleontologist be retained and that a PRIMP be implemented and followed for the project. The PRIMP should be consistent with the guidelines of the SVP (SVP, 1995) and will incorporate the following:

- Attendance at the pregrade meeting by a qualified paleontologist or his/her representative is required. At this meeting the paleontologist will explain the likelihood for encountering paleontological resources, what resources may be discovered, and the methods that will be employed if anything is discovered.
- During construction excavation, a qualified paleontological monitor shall be present on site whenever excavation occurs in sediments mapped with either medium or high sensitivity ratings. Levels of monitoring, from full-time to spot-check, will be determined by the paleontologist who develops the PRIMP. Monitoring may initially begin on a full-time basis and then be reduced to part-time if no resources are observed. During construction, excavation within the sediments that have a low sensitivity rating should occur on a spot-check basis (time to be determined by the paleontologist who develops the PRIMP) to ensure that no resources are present. The monitor shall inspect fresh cuts and/or spoils piles to recover paleontological resources. The monitor shall be empowered to temporarily divert construction equipment away from the immediate area of the discovery. The monitor shall be equipped to rapidly stabilize and remove fossils to avoid prolonged delays to construction schedules. If large mammal fossils or large concentrations of fossils are encountered, the developer shall consider using heavy equipment on site to assist in the removal and collection of large materials.
- Localized concentrations of small (or micro-) vertebrates may be found in all native sediments. Therefore, it is recommended that these native sediments occasionally be spot-screened through one-eighth to one-twentieth-inch mesh screens to determine whether microfossils are present. If microfossils are encountered, additional sediment samples (up to 3 cubic yards or 6,000 pounds) shall be collected and processed through one-twentieth-inch mesh screens to recover additional fossils.
- Any recovered specimens shall be prepared to the point of identification and permanent preservation. This includes the picking of any washed mass samples to recover small invertebrate and vertebrate fossils, the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and the storage cost for the developer, and the addition of approved chemical hardeners/stabilizers to fragile specimens.
- Specimens shall be identified to the lowest taxonomic level possible and curated into an institutional repository with retrievable storage. The repository institutions usually charge a one-time fee based on volume, so removing surplus sediment is important. The repository institution may be a local museum or university that has a curator who can retrieve the specimens on request.
- A report shall be prepared that details the methods and results of the monitoring program, even if the results are negative. If applicable, this shall include an appended itemized inventory of identified specimens. This report shall be presented to the developer for submission to the City for review. When the review process has been completed, the revised document shall signify completion of the PRIMP. A copy of the final report and the accession inventory shall be forwarded to the repository institution and any other interested parties such as the SDNHM and the City.

By following the above guidelines, impacts to nonrenewable paleontological resources will be reduced to levels that are less than significant. If fossils are discovered in sediments that have a low sensitivity rating, the project paleontologist shall evaluate the find for significance and may determine

that the sensitivity rating for similar sediments be raised to moderate or high, thus requiring additional monitoring above a spot-check level.

## 2.18.5 CONCLUSION

LSA conducted a paleontological resource assessment of the portion of the Preferred Alternative that is within the Coastal Zone on MCB Camp Pendleton, San Diego County, California. The Coastal Zone in this area of Camp Pendleton extends approximately 0.5 to 0.8 mile inland from the ocean.

The assessment consisted of a locality search performed at the San Diego Natural History Museum (SDNHM) and a pedestrian field survey. The research and field survey were conducted to determine whether construction of the Preferred Alternative within the Coastal Zone would impact paleontological resources, and if so, provide recommendations to reduce impacts to levels that are less than significant. The paleontological resources assessment was completed pursuant to the CEQA, PRC 5097.5, and in accordance with guidelines developed by the SVP, 1995 and the County of San Diego (Department of Planning and Land Use, 2006).

The locality search indicated that no paleontological resources have been previously documented within the project area or within the 0.5-mile locality search radius. The sediments mapped within the project area include the Miocene San Mateo Formation, Pleistocene marine terrace deposits, Holocene stream terrace deposits, and recent stream terrace deposits (Tan et al., 1999). According to the SDNHM, many of these sediments can contain significant paleontological resources and have paleontological sensitivity ratings from low to high.

In March 2005, LSA completed a Phase I systematic reconnaissance survey of the Camp Pendleton portion of the Preferred Alternative (Fulton, McLean, Smith, and Strudwick 2006). The purpose of the study was to identify all cultural resources 45 years or older within the project study area (APE), which included the ADI and a 300 ft buffer area around the ADI. In addition, surveyors looked for paleontological resources. This survey was constrained by both dense vegetation that covers portions of the survey area and development. For much of the project, ground visibility was limited to disturbed areas such as dirt roads and trails. No paleontological resources were observed during the survey.

As there are sensitive paleontological resources located within the project area, monitoring is recommended for sediments with a moderate to high sensitivity. If paleontological resources are identified during earthmoving activities when a paleontological monitor is not on site, ground-disturbing activities should be temporarily diverted around the find and a qualified paleontologist should be contacted to assess, and if necessary collect, the resource. Any resources that are discovered should be prepared to the point of identification, identified to the lowest taxonomic level possible, and curated into a museum with a retrievable storage system where they can be accessed by the scientific community. In addition, a final report will be prepared detailing the monitoring effort; if necessary, it will include an appended itemized inventory of identified specimens.

Please note that this report serves only as documentation of the paleontological findings for the project area and in no way represents a geological assessment. Therefore, this report should not be used as such.

# 2.19 PUBLIC SERVICES AND UTILITIES

## 2.19.1 INTRODUCTION

The following section provides an analysis of public services and utilities for the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) Preferred Alternative. Public services analyzed for the SOCTIIP build Alternatives were fire protection and emergency medical services, law enforcement, solid waste disposal services, and schools. Public facilities analyzed for the SOCTIIP build Alternatives included libraries, city halls, post offices, youth centers, community centers, and child care facilities designated for public use. In addition, impacts to flood control facilities and emergency evacuation were studied for the SOCTIIP build Alternatives. Utilities analyzed for the SOCTIIP build Alternatives were electricity, natural gas, fuel supply and transport, water, wastewater management, communications, and radio antennae.

The potential impacts to public services and utilities are evaluated in detail in the Public Services and Utilities Technical Report (P&D Consultants, 2003) and are summarized in Section 4.24 of the Final SEIR.

## 2.19.2 SETTING

### Study Area Setting

The SOCTIIP build Alternatives cover a substantial part of south Orange County and some of north San Diego County. The study area for public services and utilities includes the following local jurisdictions and communities in which physical alignments and improvements are proposed under the SOCTIIP build Alternatives: Cities of San Clemente, San Juan Capistrano, Lake Forest, Mission Viejo, Laguna Hills, Laguna Woods, Dana Point, Laguna Niguel, and Irvine, and parts of unincorporated Orange County and Camp Pendleton in San Diego County. The physical impacts of the SOCTIIP build Alternatives related to public services and utilities would be largely limited to the area of disturbance. As a result, the majority of the existing conditions discussion focuses on existing and planned services and utilities within the disturbance limits or close enough to the disturbance limits to be potentially impacted by the build Alternatives (within 76 meters ([m] [250 feet {ft}]) of the disturbance limits of the SOCTIIP build Alternatives). The specific locations of public services and utilities facilities in the vicinity of the build Alternatives were identified based on information provided by the services and utilities providers. Using Geographic Information Systems (GIS) computer technology, these utilities and services facilities and their property limits, as appropriate, were overlaid on aerial photographs, and the disturbance limits of the various build Alternatives were added. The closest distance from the edge of the disturbance limits of the build Alternatives to the edge of the public services and utilities facilities or property limits was measured within the GIS program. However, because services and utilities are generally provided in fairly large areas (a city or service area for example), this Section includes discussion of the larger service areas as appropriate, to provide an appropriate context for the service providers or utilities, their facilities and their services provided in the vicinity of the SOCTIIP build Alternatives.

## Coastal Zone Setting

The SOCTIIP study area, including the Coastal Zone, does not contain any fire protection and emergency medical services, law enforcement services, solid waste disposal services, schools, libraries, city halls, post offices, youth centers, community centers, child care facilities, flood control facilities, emergency evacuation facilities, fuel supply, or transport.

The SOCTIIP study area, including the Coastal Zone, contains telephone utilities, electric utilities, water utilities, communication utilities, natural gas pipelines, and wastewater sewer lines as described below and shown on Figures 2.19-1 and 2.19-2.

**Telephone and Communication.** Communications providers with facilities in the Coastal Zone and SOCTIIP study area are SBC, AT&T, MCI Communications, and San Diego Gas & Electric (SDG&E). SBC and AT&T own and operate communication conduit crossings, underground telephone cables, telephone distribution systems, underground telephone cable, and underground telephone conduit. MCI and SDG&E own and operate fiber optic communication cable within the Coastal Zone SOCTIIP study area. Locations of each of the above-listed telephone and communication utilities are located adjacent to the I-5 and Basilone Road and shown in Figures 2.19-1 and 2.19-2.

**Electric.** The electricity provider with facilities in the Coastal Zone and SOCTIIP study area is SDG&E. SDG&E owns and operates one 12 kilovolt (kV) feed to the San Onofre Beach Club, three 12 kV overhead lines, and one 69 kV and one 12 kV fiber optic line located adjacent to and transecting Interstate 5 (I-5) within the costal zone SOCTIIP study area. The locations of these lines are also shown in Figures 2.19-1 and 2.19-2.

**Water.** Water facilities within the Coastal Zone and SOCTIIP study area are owned and operated by San Onofre State Park (SOSP), Tri-Cities Municipal Water District (TCMWD), and the Marine Corps Air Station (MCAS). SOSP maintains a 6-inch service water line, TCMWD operates one 14-inch and one 12-inch domestic waterline, and MCAS operates an 8-inch domestic waterline. Each water facility is located adjacent to and transecting the existing I-5 within the Coastal Zone and SOCTIIP study area. The locations of these facilities are shown in Figures 2.19-1 and 2.19-2.

**Natural Gas.** Natural gas providers with facilities in the Coastal Zone and SOCTIIP study area are Southern California Gas (SCG) Company and SDG&E. Natural gas utilities in the Coastal Zone and SOCTIIP study area include a 6-inch gas feed serving Camp Pendleton-San Onofre Creek maintained by SDG&E, and three 12-inch high pressure gas pipelines maintained by SCG located adjacent to and transecting I-5. Locations of these natural gas facilities are shown in Figures 2.19-1 and 2.19-2.

**Wastewater.** Sewer facilities within the Coastal Zone and SOCTIIP study area are exclusively owned and operated by MCAS. MCAS owns and operates a 6-inch sanitary sewer force main located adjacent to I-5 that transects I-5 at Basilone Road, as shown in Figures 2.19-1 and 2.19-2.

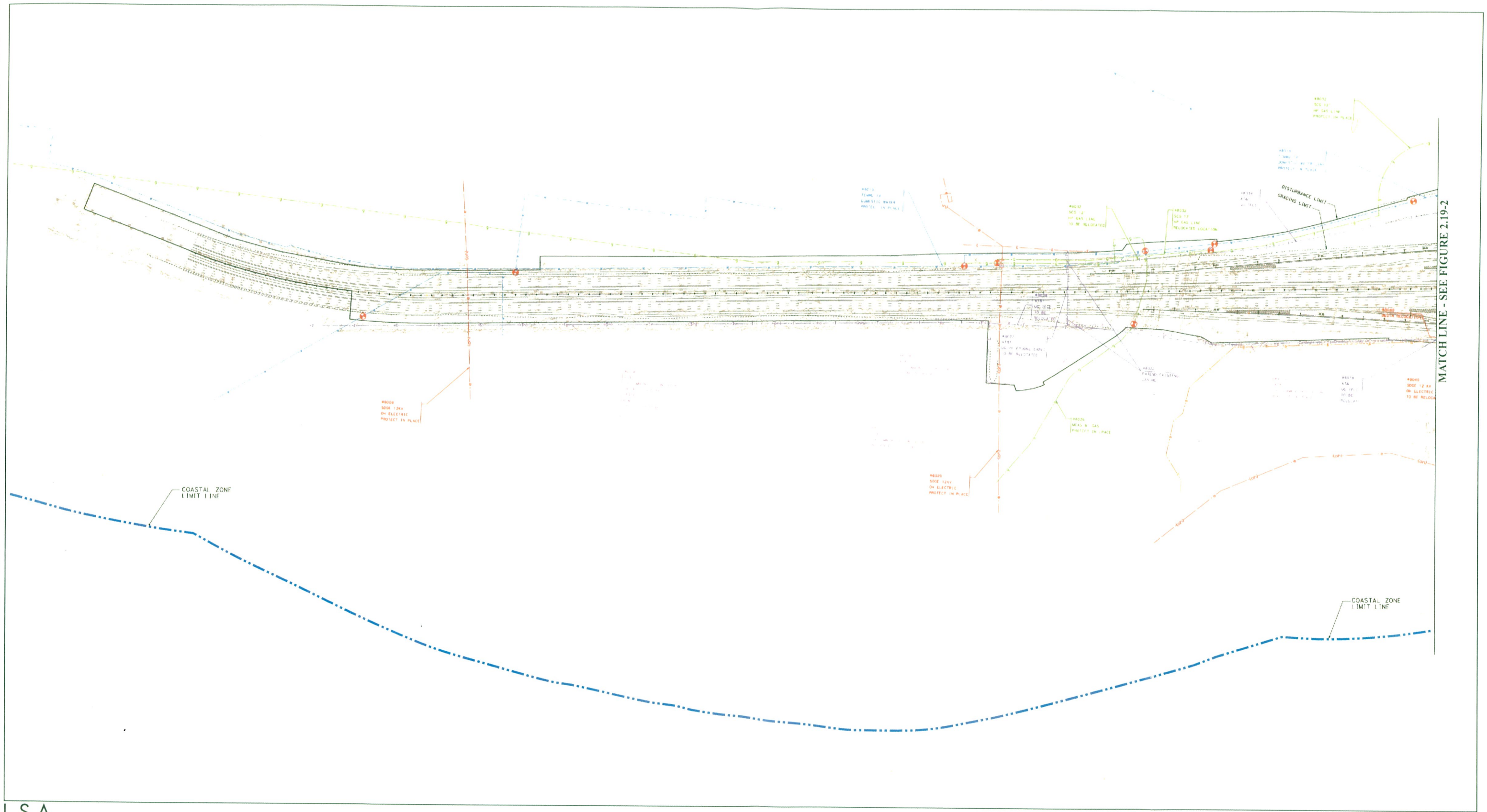


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FIGURE 2.19-1

*Foothill Transportation Corridor - South*

Utilities Within the Coastal Zone

SOURCE: Saddleback Constructors

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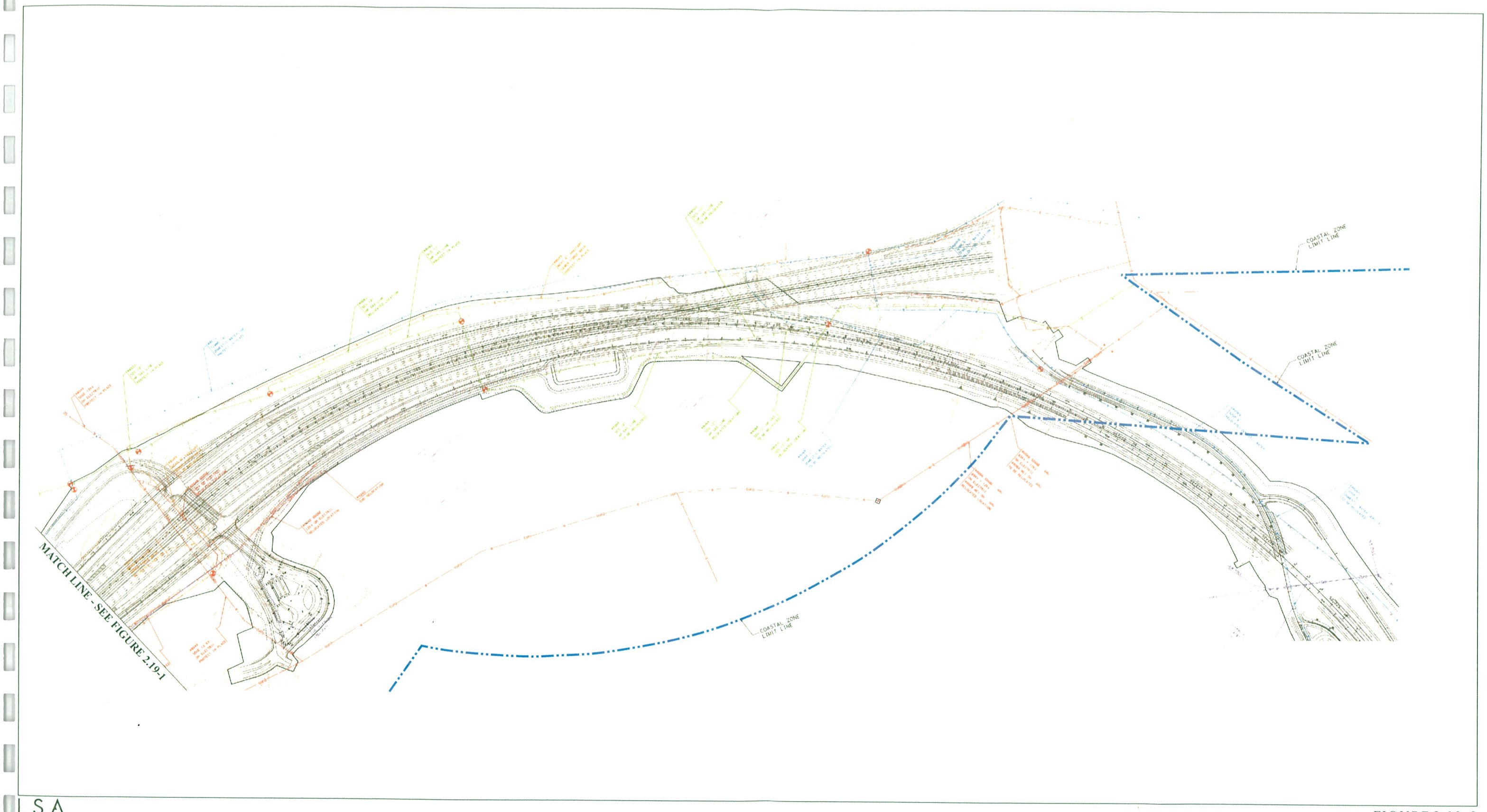


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FIGURE 2.19-2

SOURCE: Saddleback Constructors

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*Foothill Transportation Corridor – South*

Utilities Within the Coastal Zone

### Updated Information

The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements being required by the Marine Corps. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the Base.

## 2.19.3 IMPACTS

### Project Impacts

### Public Services.

**Fire Protection and Emergency Medical Services.** The types of beneficial and adverse impacts related to fire protection and emergency medical services under the Preferred Alternative are the same as described in Section 4.25.3.3 of the Final SEIR for the FEC-W-Initial. Beneficial impacts include the enhanced ability to move fire protection resources from one area to another using the corridor and the fire break properties the road would provide in the event of a wildfire. Adverse impacts include an increased risk of wildfires in currently undeveloped areas and the potential of blocked access to the existing fire road grid in undeveloped areas, which could also interfere with emergency medical response during construction and operation of the Preferred Alternative. The Preferred Alternative crosses approximately 21.9 kilometers (km) (13.6 miles [mi]) of undeveloped land that is susceptible to wildfires.

There would be no physical impacts to existing fire stations related to the Preferred Alternative, as there are no fire stations within the disturbance limits.

**Law Enforcement.** The California Highway Patrol (CHP) would be responsible for providing primary law enforcement services on the Preferred Alternative. Although the CHP has indicated that additional officers would be required to service this Alternative (Correspondence Lt. Steve Deck, June 8, 2001), this is not expected to be an adverse impact of this Alternative because the CHP would address staffing needs in its annual budget and staff allocation process.

MCB Camp Pendleton is under federal jurisdiction. The Transportation Corridor Agencies (TCA) will request that the Department of the Navy (DON) grant an easement for right-of-way through MCB Camp Pendleton. If such an easement is granted to the TCA, concurrent law enforcement jurisdiction would be transferred to the State of California for the segment of the Alternative that is approved for construction within MCB Camp Pendleton. Concurrent law enforcement jurisdiction on the corridor segment that crosses Camp Pendleton would allow the CHP to provide law enforcement service on this segment. Non-federal law enforcement jurisdiction on

the corridor segment through MCB Camp Pendleton is necessary to ensure the provision of adequate law enforcement service on this segment. It is anticipated that the MCB Camp Pendleton Provost Marshall patrol staff would provide back-up law enforcement service on the segment though Camp Pendleton through mutual aid agreements with the CHP. It is not anticipated that Provost Marshall patrol staff would be added to respond to additional mutual aid calls that may be generated with the Preferred Alternative. Therefore, this Alternative would not result in adverse impacts related to MCB Camp Pendleton law enforcement services.

The Sheriff's Department would not be responsible for law enforcement service and patrol on the Preferred Alternative. This Alternative is a transportation project and does not include the construction of residences or businesses that could increase the number of persons in a community that might use the Sheriff's Department services. Therefore, the Preferred Alternative would not result in impacts on the ability of the Sheriff's Department to provide services to contracting communities.

There would be no physical impacts to any existing law enforcement facilities related to the Preferred Alternative, as there are no law enforcement facilities in the disturbance limits.

**Solid Waste Disposal Services.** The Preferred Alternative would not result in the generation of excess soil and rock material. Therefore, this Alternative would not result in an adverse impact on landfill capacity associated with disposal of excess soil and rock during construction.

The operation of the Preferred Alternative would not result in adverse impacts to solid waste disposal or generation in Orange or San Diego Counties. Refuse collected along the Preferred Alternative during routine maintenance would be disposed of in existing landfills, including Prima Deshecha Sanitary Landfill. The first choice for disposal of landscape trimming from routine maintenance would be to deposit it, as prudent and feasible, in existing green waste composting facilities. The second choice for disposal would be into a landfill. The amount of refuse and landscape trimmings collected along this Alternative would represent a very minor part of the planned capacity of the Prima Deshecha Sanitary Landfill, the nearest landfill to the Alternative, based on the Prima Deshecha General Development Plan (GDP) 2001. Therefore, no adverse impacts to solid waste facilities would result from operation of the Preferred Alternative.

**Schools.** There are no school facilities or school property within the disturbance limits of the Preferred Alternative. Therefore, there would be no adverse direct impacts related to schools as a result of the Preferred Alternative.

The Preferred Alternative is a transportation project and does not include the construction of residences or other facilities that would result in an increase in the number of students. Therefore, this Alternative would not result in impacts on the ability of area school districts to provide services.

**Public Services Facilities.** There are no existing or planned public services facilities in the disturbance limits of the Preferred Alternative. Therefore, this Alternative would not result in impacts on existing or planned public services facilities.

**Flood Control Facilities.** There are no flood control facilities within the disturbance limits of the Preferred Alternative. Therefore, this Alternative would not result in adverse impacts related to flood control facilities.

**Utility Lines and Facilities.**

Utilities in and adjacent to the disturbance limits of the Preferred Alternative are Electricity, Natural Gas, Fuel Transport, Domestic Water, Irrigation Water, Reclaimed Water and Wastewater, Storm Drains and Telephone, Communication and Cable Television Lines. During construction there is the potential for utility service to be temporarily interrupted or for the utilities to be damaged. These impacts, should they occur during construction of the Preferred Alternative, would be adverse.

The Preferred Alternative would require the temporary use and permanent acquisition of 0.5 hectare (ha) (1.3 acres [ac]) of land at the Cristianitos substation as shown in Table 4.24-5 of the Final SEIR. The Cristianitos substation facility will not be directly impacted. However, it is possible that SDG&E could expand or modify the Cristianitos substation in the future based on their facility plans in this part of their network. The Preferred Alternative would directly impact part of the area east of the substation and could preclude future development in this area.

The Preferred Alternative would require the temporary use of 0.7 ha (1.8 ac) and permanent acquisition of 0.2 ha (0.4 ac) of land at the Talega substation. The Talega substation facility itself will not be directly impacted but the access road will be realigned as part of the project. This impact to the Talega substation would not be significantly adverse.

The SDG&E Talega Substation easement is within the disturbance limits of the Preferred Alternative. This alignment would require the temporary use of 3.8 ha (9.4 ac) and permanent acquisition of 0.7 ha (1.6 ac) of the Talega Substation easement. The Talega Substation itself will not be directly impacted but the access road may be slightly realigned as part of the project. The Talega Substation will remain operational during and after project construction, and no service interruptions are planned or anticipated to occur.

The SDG&E Cristianitos Substation land parcel is also within the disturbance limits for the Preferred Alternative. This alternative would require the temporary use of 1.7 ha (4.2 ac) and the permanent acquisition of 0.85 ha (2.1 ac) of the fee parcel for the Cristianitos Substation. The Cristianitos Substation facility itself will not be directly impacted, however, a portion of the land owned by SDG&E that is west of the substation will need to be acquired and included in the project right-of-way. The Cristianitos Substation will remain operational during and after project construction, and no service interruptions are anticipated.

**High Voltage Electrical Transmission Lines and Towers/Large Poles.** Towers/large poles associated with 138 kV, 220 kV, and 230 kV transmission lines are within the disturbance limits of

the Preferred Alternative. The utility relocation component of the proposed project involves the replacement and/or realignment of existing infrastructure, particularly electric transmission and distribution lines. For the Preferred Alternative, a maximum of 11 towers, 27 poles, and 2 pair poles would need to be relocated or added. The maximum area of impacts for these relocations/additions would be 19.3 ha (47.9 ac), including 480.8 square meters (5175 square feet) of permanent impacts for the actual footprint of the structures. For the Preferred Alternative, 3 towers, 38 wood poles and 2 wood H-frames would need to be relocated. All utilities relocations would occur within the designated disturbance area of this Alternative. The portion of the project impacts that are in part attributable to the relocation of utility infrastructure include areas with biological and cultural resources, however, these impacts are accounted for within the impacts for the Preferred Alternative and will be mitigated by the TCA as required for the implementation of the proposed project. Temporary impacts would occur as a result of construction activities associated with relocation of these utility facilities and include laydown areas and pull locations. The area of potential impacts also includes approximately 3.8 ha (9.4 ac) of permanent impacts for utility access roads for the Preferred Alternative and approximately 2.8 ha (6.8 ac) for the Preferred Alternative. Should service from these lines be temporarily interrupted or the utilities damaged during construction, service outage would be experienced over a far wider area than with impacts to smaller lines, and numerous people would be affected. Therefore, the potential impacts associated with these high voltage lines would be adverse.

Adjustments to the Utility Relocation Plan for the Preferred Alternative include relatively minor changes as well as more comprehensive adjustments to maintain utilities in-line. Changes in the vicinity of the I-5 interchange are relatively minor, and will allow for the utilities to be relocated in conformance with Caltrans design standards. Additional information on improved utility relocation design is provided in Section 2.2 of the Final SEIR.

Overall, the refinements to the Utility Plan for the Preferred Alternative will result in taller but fewer towers/poles in the project disturbance limits.

**Percolation Ponds and Wells.** One of the twelve percolation ponds on MCB Camp Pendleton, located south of San Onofre Creek, is within the disturbance limits of the Preferred Alternative for an extended detention basin (EDBs). The Preferred Alternative would result in the temporary use of 0.7 ha (1.7 ac) and permanent acquisition of approximately 0.4 ha (1.0 ac) of the pond. This would be an adverse impact of this Alternative related to this percolation pond. The Preferred Alternative will result in temporary and permanent use of approximately 1.21 ha (3 ac) of the pond. This is considered an adverse impact of the Preferred Alternative.

There are no irrigation or potable water wells in the disturbance limits of the Preferred Alternative. Therefore, there would be no potential adverse impacts to wells related to this Alternative.

**Emergency Evacuation.** The beneficial effects of the Preferred Alternative related to emergency evacuation would be essentially the same as described in Section 4.24.3.3 of the Final SEIR for the FEC-W-Initial Alternative. Specifically, this Alternative would have the positive effect of increasing the speed at which evacuations could be completed and would provide an alternate route should I-5 become impassable.

## Impacts in Coastal Zone

Utilities impacted by the proposed alternative and located in the Coastal Zone are telephone, communication, electricity, water, natural gas, and wastewater.

**Telephone and Communication.** Impacted telephone and communication systems located within the Coastal Zone are listed in Table 2.19-A, and shown in Figures 2.19-1 and 2.19-2. Four telephone utilities and two communication utilities would be impacted by the Preferred Alternative. Impacts could result in a relocation or protection of the utility as shown in Table 2.19-A below. However, impacts and interruption to service regarding telephone and communication utilities would be minimal. Therefore, no mitigation measures are identified or necessary.

### Table 2.19-A: Impacted Telephone and Communication Utilities in the Coastal Zone

| Description | Owner | Impact | Location Reference Number |
|---|---|---|---|
| Telephone distribution system at Basilone Road | SBC | Relocation | 8056 |
| Telephone cable (underground) | SBC | Relocation | 8070 (not shown in Figures 2.19-1/2.19-2) |
| Telephone underground cable at Basilone Road to San Onofre Creek | SBC | Relocation | 8038 |
| Telephone underground conduit | SBC | Protected | 8022 |
| Communication conduit crossing | SBC and AT&T | Partial relocation; partially protected | 8036A and 8036B |
| Fiber Optic communication cable | MCI-SDGE | Relocation | 8068 |

Source: Tetra Tech, January 2007.

**Electricity.** Impacted electrical utilities located within the Coastal Zone are listed in Table 2.19-B and shown in Figures 2.19-1 and 2.19-2. Five electrical utilities would be impacted by the Preferred Alternative. Impacts could result in a relocation or protection of the utility as shown in Table 2.19-B. However, impacts and interruption to electrical service utilities would be minimal. Therefore, no mitigation measures are identified or necessary.

**Water.** Impacted water utilities located within the Coastal Zone are listed in Table 2.19-C and shown in Figures 2.19-1 and 2.19-2. Three water utilities owned by SOSP, TCMWD, and the MCAS would be impacted by the Preferred Alternative. Impacts would result in both protection of the utilities and relocation of the utilities, as shown in Table 2.19-C below and Figures 2.19-1 and 2.19-2. However, impacts or interruption to water service would be minimal. Therefore, no mitigation measures are identified or necessary.

### Table 2.19-B: Impacted Electrical Utilities in the Coastal Zone

| Description | Owner | Impact | Location Reference Number |
|---|---|---|---|
| 12,000 volt feet to San Onofre Beach Club | SDG&E | Protected in place | 8020 |
| 12,000 volt overhead | SDG&E | Protected in place | 8008 |
| 12,000 volt overhead above Basilone Road Bridge | SDG&E | Partial relocation/partially protected in place | 8048 |
| 12,000 volt overhead distribution feed along BAS-1 and BAS-2 | SDG&E | Relocated | 8040 |
| 69,000 volt and 12,000 volt (including relocation of Fiber Optic 8068 listed above under communications) | SDG&E | Relocated | 8066 |

Source: Tetra Tech, January 2007.

### Table 2.19-C: Impacted Water Utilities in the Coastal Zone

| Description | Owner | Impact | Location Reference Number |
|---|---|---|---|
| 6-inch service waterline at San Mateo | SOSP | Relocation | 8069 |
| 14-inch domestic waterline | TCMWD | Protected | 8019 |
| 8-inch domestic waterline | MCAS | Protected | 8009 |

Source: Tetra Tech, January 2007.

**Natural Gas.** Impacted natural gas utilities located within the Coastal Zone are listed in Table 2.19-D and shown in Figures 2.19-1 and 2.19-2. Four natural gas utilities would be impacted by the Preferred Alternative. Impacts could result in a relocation or protection of the utility as shown in Table 2.19-D. However, impacts and interruption to natural gas service would be minimal. Therefore, no mitigation measures are identified or necessary.

### Table 2.19-D: Impacted Natural Gas Utilities in the Coastal Zone

| Description | Owner | Impact | Location Reference Number |
|---|---|---|---|
| 6-inch natural gas feed to Camp Pendleton and San Onofre Creek | SDG&E | Protected | 8026 |
| 12-inch high-pressure gas line | SCG | Relocated | 8064 |
| 12-inch high-pressure gas pipeline | SCG | Partially protected/ partial relocation | 8032 |
| 12-inch high-pressure gas pipeline | SCG | Relocated | 8062 |

Source: Tetra Tech, January 2007.

**Wastewater.** Impacted wastewater utilities located within the Coastal Zone are listed in Table 2.19-E and shown in Figures 2.19-1 and 2.19-2. One wastewater utility maintained by MCAS would be impacted by the Preferred Alternative. Impacts would result in a partial protection of the utility and a

partial relocation of the utility located at Basilone Road, as shown in Table 2.19-E and Figures 2.19-1 and 2.19-2. However, impacts or interruption to wastewater service would be minimal. Therefore, no mitigation measures are identified or necessary.

**Table 2.19-E: Impacted Wastewater Utilities in the Coastal Zone**

| Description | Owner | Impact | Location Reference Number |
|---|---|---|---|
| 6-inch sanitary sewer force main (San Mateo Point) | MCAS | Partially protected in place/ Partial relocation | 8049 |

Source: Tetra Tech, January 2007.

## 2.19.4 MITIGATION

The following mitigation measures were developed to avoid or minimize as much as possible the impacts of the SOCTIIP build Alternatives related to public services and utilities. Mitigation measures originally identified in the MMP for EIR No. 3 have been incorporated, as appropriate, in these mitigation measures. Mitigation measures not originally identified in EIR No. 3 have been added to address additional impacts identified for the SOCTIIP Alternatives.

The TCA will comply with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 in the acquisition of all property within the right-of-way necessary for the proposed project. The provisions of this Act, as well as mitigation measures related to temporary use and permanent acquisition of property, are addressed in detail in Section 4.4 of the Final SEIR.

The measures are also included in the Mitigation Monitoring and Reporting Program in Appendix A of this document.

### Mitigation Measures for Public Services

**Mitigation to Avoid or Reduce the Temporary Use and/or Permanent Acquisition of Public Services and Utilities Property.** The Preferred Alternative would result in the temporary use and/or permanent acquisition of property currently used by public services and utilities. Mitigation measure PS-1, below, is intended to ensure that these impacts are minimized or avoided through design refinement during the final design of the selected alternative. In the event that the temporary use or permanent acquisition of this property cannot be avoided, mitigation measures described later in this Section would apply to the Preferred Alternative to address those temporary and/or permanent impacts consistent with the requirements of the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970. In addition to the mitigation measures listed below, Project Design Feature (PDF) 11-2 ensures that SDG&E utility relocations are conducted in a manner that is consistent with SDG&E's subregional NCCP.

**PDF 11-2** **SDG&E NCCP Operational Protocols.** Utility relocation will be conducted in a manner that is consistent with the operational protocols established in SDG&E's Subregional NCCP, including measures that address general behavior for all field

personnel, preactivity studies and survey work, maintenance, repair and construction of facilities, and construction and maintenance of access roads.

PS-1 **Avoidance of the Temporary Use and/or Permanent Acquisition of Public Services and Utilities Property.** During final design, the TCA or the implementing agency/agencies will refine the design to the extent feasible based on engineering judgment and design standards to avoid or minimize the temporary use during construction and the permanent acquisition of land currently occupied by public services and utilities. In the event that the temporary use or permanent acquisition of this property cannot be avoided through design refinements, other mitigation measures identified for the compensation of temporary and permanent use of public services and utilities property will apply to the build Alternatives.

**Mitigation for Fire Protection, Law Enforcement, and Emergency Medical Services.**

PS-2 **Fire Protection.** During construction, in areas subject to wildland fires as determined by the Orange County Fire Authority (OCFA), or the MCB Camp Pendleton Fire Department for areas on MCB Camp Pendleton, the contractor will be required to install signs around construction sites warning of high fire risk and of area closings during the high fire season as declared by OCFA or the MCB Camp Pendleton Fire Department.

PS-3 **Fire Protection.** During operation of a build Alternative, Caltrans (for the corridor, Ortega Highway, and I-5) and/or the local jurisdiction (for local arterials), as appropriate, will install signs along the new or improved road segments in areas subject to wildland fires as determined by the OCFA, or the MCB Camp Pendleton Fire Department for areas on MCB Camp Pendleton, warning of high fire risk and of area closings during the high fire season declared by OCFA and the MCB Camp Pendleton Fire Department.

PS-4 **Fire Protection.** Emergency call boxes will be installed along the road in undeveloped areas of high and extreme fire hazard, consistent with existing OCFA, Orange County Transportation Authority, Caltrans, TCA, and/or local jurisdiction, as appropriate, policies on emergency call boxes.

PS-5 **Fire Protection.** During construction of a build Alternative, the contractor will be required to maintain access to the existing fire road grid for the OCFA, and the MCB Camp Pendleton Fire Department for areas on MCB Camp Pendleton.

PS-6 **Fire Protection.** During final design for a build Alternative, the long-term preservation/provision of access to the existing fire road grid for the OCFA, and the MCB Camp Pendleton Fire Department for areas on MCB Camp Pendleton, will be incorporated in the facility design, in consultation with the OCFA and the MCB Camp Pendleton Fire Department.

PS-7 **Fire Protection.** During construction of a build Alternative, the contractor will implement fuel modification techniques as required by the OCFA, and the MCB Camp Pendleton Fire Department in areas on MCB Camp Pendleton, in areas of fire hazard as determined by the OCFA and the MCB Camp Pendleton Fire Department.

**PS-8** **Fire, Emergency Medical and Law Enforcement.** During final design, the TCA, Caltrans, and/or the City of San Clemente, as appropriate, will coordinate the addition of OPTICON or other traffic pre-emption devices as used in the City of San Clemente with the City's traffic engineer. These devices will be provided at impacted intersections, as identified in the Traffic Technical Report, to reduce impacts to fire, medical emergency, and law enforcement response times.

**PS-9** **Fire, Emergency Medical and Law Enforcement.** During construction the TCA or the implementing agency/agencies will require the contractor to coordinate all temporary ramp closures and detour plans with fire, emergency medical, and law enforcement providers to minimize temporary delays in response times.

**PS-10** **Law Enforcement.** Prior to operation of any build Alternative which crosses MCB Camp Pendleton, the State of California shall solicit a transfer of concurrent legal (law enforcement) jurisdiction from the federal government to the State for any part of an alternative that crosses MCB Camp Pendleton as provided in Section 2851 of the Fiscal Year 1999 National Defense Authorization Act (H.R. 3616).

### Mitigation for Solid Waste.

**PS-11** **Solid Waste.** Prior to the final design of a build Alternative that crosses Prima Deshecha Sanitary Landfill, the TCA (Corridor Alternatives) or implementing agency/agencies (AIO Alternative) shall consult with site engineers from the Landfill to identify and incorporate design elements that minimize impacts related to capacity and Landfill life span. Construction across or excavation in any areas previously used for landfilling will be carried out consistent with all pertinent local, state and federal regulations regarding construction and disturbance in areas previously used for landfilling.

In addition to mitigation measure PS-11, refer to Mitigation Measures HM-11 in Section 4.17 (Hazardous Materials and Hazardous Waste Sites) and SE-1 in Section 4.4 of the Final SEIR (Socioeconomics and Environmental Justice), both of which also address avoidance or minimization of impacts related to Prima Deshecha Sanitary Landfill.

**PS-12** **Solid Waste.** During final design of a build Alternative which crosses Prima Deshecha Sanitary Landfill, the TCA (Corridor Alternatives) or implementing agency/agencies (AIO Alternative) will incorporate access routes on the Landfill site to accommodate travel within this site for waste disposal and other vehicles. Specifically, the access routes will allow vehicles to access Zone 4 from the existing La Pata Avenue access road and to access all areas in Zone 4. At no time, including during construction, will access to or within Prima Deshecha Sanitary Landfill be restricted such that landfilling operations are adversely affected. The current designs for the corridor Alternatives include this access. The current designs for the AIO Alternative would require modification by the implementing agency/agencies to include this access.

**PS-13** **Solid Waste.** Prior to construction of a build Alternative which will generate excess fill, the contractor will be required to offer fill for use in other development projects or to area

landfills as daily cover. Landfilling of excess soil and rock material will be considered the option of last resort.

**PS-13A Solid Waste.** Excess fill material from construction will not be disposed of at MCB Camp Pendleton landfills, unless such disposal is approved in advance though mutual agreement with the Environmental Security Department's Solid Waste Branch. If Base agreement for such disposal is granted, the contractor shall be responsible for hauling the materials to the Base landfill(s) and for complying with all Base regulations regarding the transport and disposal of that material on the Base.

### Mitigation for Schools.

Short-term construction impacts and long-term operational impacts on schools potentially include air, noise and traffic related impacts. Those impacts are analyzed in the Final SEIR sections for air, noise and traffic and appropriate mitigation measures have been provided in those sections to address these potential adverse impacts of the SOCTIIP Alternatives on schools. Mitigation Measures PS-14 and PS-15 address direct permanent and temporary impacts to schools. There are no schools in the Coastal Zone.

### Mitigation for Public Facilities.

Short-term construction impacts and long-term operational impacts on public facilities potentially include air, noise and traffic related impacts. Those impacts are analyzed in the Final SEIR Sections for air, noise and traffic and appropriate mitigation measures are provided in those sections to address these potential adverse impacts of the SOCTIIP Alternatives on public facilities.

**PS-16 Public Facilities.** Consistent with requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, the TCA or other implementing agency/agencies will negotiate with owners of public facilities that will be removed, partially removed or will experience loss of parking facilities, to determine appropriate action and/or compensation to mitigate for the temporary use and/or permanent acquisition.

### Mitigation Measures for Public Utilities.

**U-1 Utilities.** As early as possible during final design, the TCA or other implementing agency/agencies, as appropriate, will consult with each utility provider/owner to avoid or reduce potential impacts on existing and planned utilities through design refinements. Should impacts be unavoidable, all affected facilities shall be relocated or protected in place prior to, during or after construction, as appropriate, and in accordance with the methods and designs approved by the affected utility provider/owner. For utilities located on MCB Camp Pendleton, as early as possible the TCA or other implementing agency/agencies will consult with and receive approval from the Marine Corps on any utility relocations or realignments prior to discussing the proposed activities with utility providers.

**U-2 Temporary Use and Permanent Acquisition.** Consistent with requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, the TCA or other

implementing agency/agencies will negotiate with utility providers whose facilities will be temporary used and/or permanently acquired to determine appropriate action and/or compensation to mitigate for the temporary use and/or permanent acquisition of their property.

U-3 **MCB Camp Pendleton Percolation Ponds.** Consistent with requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 appropriate action and compensation to reduce the effect of the encroachment on MCB Camp Pendleton will be negotiated with the Department of the Navy.

## 2.19.5 CONCLUSION

Impacts within the Coastal Zone and SOCTIIP study area related to public services and utilities would be mitigated to below a level of significance based on the mitigation measures listed above.

# 2.20 RECREATION RESOURCES

## 2.20.1 INTRODUCTION

The potential impacts of the Preferred Alternative related to recreation, pedestrian, and bicycle facilities are discussed in this section. The Recreation Resources Technical Report (P&D Consultants, 2003) was reviewed to determine the potential impacts related to recreation resources for the Preferred Alternative. This summary is also based on information in Sections 4.5 and 4.25 of the Final Subsequent Environmental Impact Report (SEIR).

## 2.20.2 SETTING

### Study Area Setting

Recreation resources are resources that provide refreshment, diversion, entertainment, and/or amusement. Existing and planned recreation resources in the project study area could include State parks, regional parks, community parks, neighborhood parks, mini parks, school recreational facilities, private parks and recreational facilities, and special use facilities. These recreation resources were defined for this analysis as follows:

- A State park was defined as a park that is owned/leased and operated by the State of California Department of Parks and Recreation. State parks can include beaches, open space, picnic areas, boating, trails, organized sports activities, and/or parking.
- A regional park was defined as a park that is operated by the County of Orange Department of Harbors, Beaches and Parks. Regional parks can include open space, picnic areas, boating, trails, organized sports activities, and/or parking.
- A community park was defined as a park that is usually 4.1 hectares (ha) (10 acres [ac]) or larger in size that serves the recreational needs of several neighborhoods. Community parks may include multipurpose sports fields, basketball courts, baseball fields, tennis courts, volleyball courts, swimming pools, community centers, and/or parking.
- A neighborhood park was defined as a park that is usually greater than 0.41 ha (1 ac) and may be as large as 4.1 ha (10 ac) and that serves the recreational needs of a single neighborhood. Neighborhood parks may include playground equipment, a baseball field, a basketball half-court, a picnic area, and/or parking.
- A mini park was defined as a park that is less than 0.41 ha (1 ac) and that usually has quiet game areas and children's play areas. Some mini parks may be natural areas with no improvements to protect natural resources and/or scenic vistas.
- School recreational facilities were defined as the playing fields, track fields, and pools located within school complexes that are for use by students during school hours and that are open to the public at other times.

- Private parks and recreational facilities were defined as resources owned and operated by homeowners' associations or other parties for the exclusive use of association members or other restricted memberships. Private facilities may include any of the amenities that other parks include and may be of any size.
- Special use facilities were defined as facilities designed to meet the requirements of specific recreational, social, and cultural activities. Golf courses, sports parks, equestrian centers, and open space with associated trails are considered special use facilities.

Table 2.20-1 identifies recreation resources in the vicinity of the Preferred Alternatives both within and outside of the Coastal Zone. Figure 2.20-1 shows the existing and proposed recreation resources in the general vicinity of the Preferred Alternative in the Coastal Zone. Existing recreation resources in the Coastal Zone include three regional parks, one State park that includes an existing regional public bicycle trail, one military community facility (Marine Corps Base [MCB] Camp Pendleton San Onofre Recreation Beach), two special use facilities (one privately owned and one publicly owned), one community park, and one school sports field. A neighborhood park is proposed in the City of San Clemente project vicinity.

Pedestrian and bicycle facilities in the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) study area refer to trails, bikeways and sidewalks that are typically marked and are implemented and maintained by public agencies and private groups. Pedestrian and bicycle facilities in the SOCTIIP study area include riding and hiking trails and bikeways. Regional riding and hiking trails are unpaved and off-road, and are used by pedestrians, equestrians, and/or bicyclists. Bikeways are off-road, paved or unpaved public or private paths that allow pedestrian and bicycle use. Class II bikeways along paved roads are identified with a striped line separating the bikeway from the road travel lanes. Class III bikeways are also found along paved roads, but they are not striped; they are only identified by signage. Sidewalks in the study area are also considered to be pedestrian trails.

Table 2.20-2 shows pedestrian facilities within 0.4 kilometer (km) (0.25 mile [mi]) of the centerlines of the Preferred Alternative that are part of a recreation resource. There is one existing Class II bikeway along Oso Parkway in the study area of the Preferred Alternative. In addition, there is one proposed Class II bikeway along Ortega Highway in the study area of the Preferred Alternative.

Table 2.20-3 describes the pedestrian trails within 0.4 km (0.25 mi) of the centerlines of the Preferred Alternative. Pedestrian trails on The Donna O'Neill Land Conservancy (The Conservancy) can be accessed on an appointment-only basis for docent-led hikes.

Several trails provide beach access from the campground and from public parking areas. The main trails lead to Upper and Lower Trestles Beach. The first trail crosses I-5 via the Cristianitos Road overcrossing and leads to Upper Trestles Beach. The second trail crosses under the San Mateo Creek Bridge and joins the Cristianitos Road trail leading to Upper Trestles Beach.

## Table 2.20-1: Recreation Resources in the Vicinity of the Preferred Alternative

| Name and Address | Owner/Operator | Description |
|---|---|---|
| **Existing Recreation Resources** | | |
| San Clemente Municipal Golf Course<br>150 East Avenida Magdalena | City of San Clemente | A special use facility of approximately 51 ha (126 ac) in south San Clemente, northeast of Interstate 5 (I-5), immediately north of Avenida San Luis Rey. Includes 18 holes, a clubhouse, parking, and a practice range. Open to the public. |
| Vista Bahia Stadium Park<br>402 Calle Bahia | City of San Clemente | A special use facility of approximately 2.4 ha (6.0 ac) in south San Clemente, north of I-5, immediately adjacent to Calle Bahia and San Clemente Municipal Golf Course. Includes a Little League playing field, batting/pitching cage, concessions, trap and skeet range, restrooms, and parking. |
| Pacific Golf Club<br>200 Avenida La Pata | Mr. Okuda/Frank Adlesh | A privately owned special use facility of approximately 100 ha (246 ac) southeast of the Avenida Pico/Avenida La Pata intersection. Includes 27 holes, clubhouse facilities, and parking. Not open to the public. |
| Talega Community Park<br>Southeast of the intersection of Calle Pacifica and Camino La Pedriza | City of San Clemente | A community park of approximately 0.16 ha (0.39 ac) proposed north of Avenida Pico, northeast of the intersection of Avenida Pico and Avenida Vista Hermosa. Includes playground equipment and a picnic area. |
| General Thomas F. Riley Wilderness Park<br>30952 Oso Parkway<br>Coto de Caza | County of Orange | A regional park of approximately 202 ha (498 ac) and 8 km (5 mi) of trails west of Ortega Highway, immediately west of Oso Parkway, and east of the intersection of Antonio Parkway and Oso Parkway. Includes unpaved hiking and bicycling trails, a ranger station/visitor information area, and parking. |
| The Donna O'Neill Land Conservancy<br>Access is from Cristianitos Road off Ortega Highway at the "Green Gate" | The Donna O'Neill Land Conservancy (private) | A private special use facility of approximately 520 ha (1,284 ac) north of Avenida Pico, south of Ortega Highway, immediately west of Cristianitos Road. Includes a visitor information center, classrooms, parking, and pedestrian hiking trails. Open to public use only by appointment and guided tour. |
| Tesoro High School Sports Fields<br>29758 Oso Parkway<br>Rancho Santa Margarita | Capistrano Unified School District | Approximately 13 ha (32 ac) of sports fields east of Antonio Parkway, immediately south of Oso Parkway. Used for public Little League and other organized sports. Includes a football/soccer field, a baseball field, a track, a pool, tennis courts, and basketball courts. |
| Caspers Regional Park<br>33401 Ortega Highway | County of Orange | A regional park of approximately 3,237 ha (8,000 ac) off Ortega Highway east of Antonio Parkway. Includes overnight camping facilities, an equestrian center, and a 35 mi trail network. |

| Name and Address | Owner/Operator | Description |
|---|---|---|
| San Onofre State Beach (SOSB) Subunit 3<br>West side of I-5 along Old Pacific Coast Highway and north of the San Onofre Nuclear Generating Station (SONGS). | United States Navy/California State Parks | A State park of approximately 31 ha (76 ac) southeast of the Basilone Road/I-5 interchange, immediately northwest of SONGS. Includes beach access, parking, showers, lifeguard towers, restroom, and a park gate. |
| SOSB Subunit 2<br>South of Cristianitos Road along beach side of I-5 to MCB Camp Pendleton's San Onofre Recreation Beach area. | United States Navy/California State Parks | A State park of approximately 86 ha (213 ac) immediately south of the Cristianitos Road/I-5 interchange. Includes a pedestrian and bicycle trail, and restrooms. It also includes a 33.2 ha (82 ac) wetland preserve area. |
| SOSB Subunit 1<br>East of I-5 extending north to the Orange County border. The remainder of the Subunit parallels Cristianitos Road and includes the San Mateo Campground area and trails. | United States Navy/California State Parks | A State park of approximately 564 ha (1,393 ac) immediately northeast of the Cristianitos Road/I-5 interchange. Includes overnight camping, day camping, pedestrian and bicycle trails, showers/restroom, lifeguard towers, and parking. |
| MCB Camp Pendleton San Onofre Recreation Beach Between SOSB Subunit 2 and SOSB Subunit 3. | United States Navy/Camp Pendleton Marine Corps Community Services Department | A regional park of approximately 23 ha (57 ac) south of the Basilone Road/I-5 interchange, immediately southwest of I-5. Includes overnight camping, a clubhouse, lodging facilities, recreational vehicle (RV) camping, a concessions stand, lifeguard towers, picnic areas, and parking. Open only to active duty military personnel and military retirees, and their families and friends. Not open to the public. |
| **Proposed Recreation Resources** | | |
| Proposed South San Clemente Neighborhood Park (east/west)<br><br>In the SOSB Subunit 1 and near the southernmost end of San Clemente Municipal Golf Course, or in the northeast section of San Clemente State Beach adjacent to the existing State Parks office. The location of this proposed park has not been decided to date. | The proposed resource is not in public ownership at this time. | A proposed neighborhood 2.0 ha (5.0 ac) park. Two locations under consideration:<br>(1) immediately west of Avenida del Presidente, south of Avenida Calafia in south San Clemente or east of I-5; or (2) north of the I-5/Cristianitos interchange in the SOSB Subunit 1. Proposed facilities include parking, beach access, restrooms, basketball courts, a skate court, tennis courts, volleyball courts, playground equipment, a pedestrian and bicycle trail, and a picnic area. |
| San Juan Creek Regional Park | Private Ownership | This park is no longer proposed. |

Source: P&D Consultants (2003).
Note: Refer to Figure 2.20-1 for the locations of these recreation resources.

FIGURE 2.20-1

*Foothill Transportation Corridor - South*

Recreation Resources in the Study Area for the A7C-FEC-M Alternative

LSA

SOURCE: CDMG and P&D Consultants (2003)

I:\TCA531\Coastal Zone Analysis\Fig 2.20-1.cdr (3/9/07)

## Table 2.20-2: Pedestrian Facilities in the Preferred Alternative Study Area

| Name and Address | Owner/Operator | Description |
|---|---|---|
| **Existing Facilities** | | |
| General Thomas F. Riley Wilderness Park<br>30952 Oso Parkway<br>Coto de Caza | County of Orange | A regional park of approximately 202 ha (498 ac) and 8 km (5 mi) of trails west of Ortega Highway, immediately west of Oso Parkway, and east of the intersection of Antonio Parkway and Oso Parkway. Includes improved riding and hiking trails, a ranger station/visitor information area, and parking. |
| The Donna O'Neill Land Conservancy<br>Access is from Cristianitos Road off Ortega Highway at the "Green Gate." | The Donna O'Neill Land Conservancy (private) | A private special use facility of approximately 520 ha (1,284 ac) north of Avenida Pico, south of Ortega Highway, immediately west of Cristianitos Road. Includes a visitor information center, classrooms, parking, and pedestrian hiking trails. Open to public use only by appointment and guided tour. |
| SOSB Subunit 1<br>East of I-5 extending north to the Orange County border. The remainder of the subunit parallels Cristianitos Road and includes the San Mateo Campground area and trails. | United States Navy/California State Parks | A State park of approximately 564 ha (1,393 ac) immediately northeast of the Cristianitos Road/I-5 interchange. Includes overnight camping, day camping, pedestrian and bicycle trails, showers/restroom, lifeguard towers, and parking. |

Source: P&D Consultants (2003).
Note: Refer to Figure 2.20-1 for the locations of these facilities.

## Table 2.20-3: Trails in the Preferred Alternative Study Area[1]

| Name and Location | Owner/Operator | Description |
|---|---|---|
| **Existing Trails** | | |
| Rancho San Clemente Ridgeline Trail | City of San Clemente | A paved pedestrian and bicycle trail approximately 6.2 km (3.8 mi) long that has its trail head north of the parking lot and skate court at Richard T. Steed Memorial Park. The trail follows the ridge from Salvador to Avenida Pico, San Clemente. |
| The Donna O'Neill Land Conservancy Trails | The Donna O'Neill Land Conservancy | Portions of several trails are within the disturbance limits of the Preferred Alternative, including North Ridge, Shady Canyon, Middle Ridge, High Ridge Trails, Meadow cut off, and two roads including Gato Canyon Road and Back Road. The trails map of The Conservancy was provided after publication of the Draft EIS/SEIR (see Attachment 9 of the Response to Comments document). The map provided by The Conservancy is not to scale; therefore, it is not possible to make a precise calculation of the linear impacts to trails. The Conservancy trails are under private ownership and are available to the public on an appointment basis for docent-led hikes. |
| **Proposed Trails** | | |
| Proposed Cristianitos Trail | The proposed resource is not in public ownership. | A regional riding and hiking trail approximately 8.0 km (5.0 mi) long that is proposed to extend from the northwest corner of San Onofre State Beach around the eastern edge of The Donna O'Neill Land Conservancy to its terminus at San Juan Creek Trail. |

Source: P&D Consultants (2003).
Note: Trails within existing recreation resources are listed as amenities within the descriptions of the individual recreation resources within which they occur. Therefore, those trails are not listed in Table 2.20-3.

[1] These trails are located outside the Coastal Zone.

## Coastal Zone Setting

Table 2.20-4 describes the existing and proposed recreation resources in the Coastal Zone in the vicinity of the Preferred Alternative, including the full name, address/location, and owner/operator. The three recreation resources listed in Table 2.20-4 are entirely within the Coastal Zone.

### Table 2.20-4: Recreation Resources in the Study Area of the Preferred Alternative

| Name and Address | Owner/Operator | Description |
|---|---|---|
| **Existing Recreation Resources** | | |
| SOSB Subunit 3<br>West side of I-5 along Old Pacific Coast Highway and north of SONGS. | United States Navy/California State Parks | A State park of approximately 31 ha (76 ac) southeast of the Basilone Road/I-5 interchange, immediately northwest of SONGS. Includes beach access, parking, showers, lifeguard towers, restroom, and a park gate. |
| SOSB Subunit 2<br>South of Cristianitos Road along beach side of I-5 to Camp Pendleton's San Onofre Recreation Beach area. | United States Navy/California State Parks | A State park of approximately 86 ha (213 ac) immediately south of the Cristianitos Road/I-5 interchange. Includes a pedestrian and bicycle trail and restrooms. It also includes a 33.2 ha (82 ac) wetland preserve area. |
| MCB Camp Pendleton San Onofre Recreation Beach Between SOSB Subunit 2 and SOSB Subunit 3 | United States Navy/Camp Pendleton Marine Corps Community Services Department | A regional park for use by military personnel of approximately 23 ha (57 ac) south of the Basilone Road/I-5 interchange, immediately southwest of I-5. Includes overnight camping, a clubhouse, lodging facilities, RV camping, a concessions stand, lifeguard towers, picnic areas, and parking. Open only to active duty military personnel and military retirees, and their families and friends. Not open to the public. |

Source: P&D Consultants (2003).
Note: Refer to Figure 2.20-1 for the locations of these recreation resources.

Several trails provide beach access from the campground and from public parking areas. The main trails lead to Upper and Lower Trestles Beach. The first trail crosses I-5 via the Cristianitos Road overcrossing and leads to Upper Trestles Beach. The second trail crosses under the San Mateo Creek Bridge, and joins the Cristianitos Road trail leading to Upper Trestles Beach. These trails are within the SOSB Subunits.

## Updated Information

There are no changes to the status of existing recreation resources in the study area since the certification of the Final SEIR. The project footprint has been reconfigured at the Basilone Road entrance to MCB Camp Pendleton in order to comply with new Homeland Security requirements. The new gate area facility will include six sentry houses, a 510-square-foot gatehouse, a truck inspection area with canopy, a watch tower, control gates, and a parking area. The impacts in the Coastal Zone as summarized in this report reflect the modified footprint at Basilone Road.

Similarly, the project has been modified to provide improved military access to MCB Camp Pendleton Green Beach, an amphibious military training beach. The impacts in the Coastal Zone as summarized in this report reflect the project refinements to the military access to Green Beach.

The project refinements are enhancements that support improved security and the military training mission of the MCB Camp Pendleton.

## 2.20.3 IMPACTS

### Project Impacts

**Temporary Impacts.** As shown in Figure 2.20-1, construction of the Preferred Alternative will result in the temporary occupancy of land from The Conservancy, SOSB Subunit 1, and SOSB Subunit 2. Areas identified as temporary occupancy are in addition to the areas identified for permanent acquisition. Temporary occupancy defines areas that will be within the disturbance limits and that will be used only during construction of the Preferred Alternative. After the completion of construction, the temporary occupancy areas will be restored to their pre-project conditions. The use of land from these recreation resources will result in adverse affects on amenities at the existing resources (The Conservancy and SOSB) through the removal of open space. Based on the temporary occupancy of land at these resources, the Preferred Alternative will result in an adverse impact on these resources.

Indirect impacts on recreation resources are shown in Table 2.20-5. As shown in Table 2.20-5, temporary adverse construction noise impacts of the Preferred Alternative will occur at Tesoro High School, Talega Community Park, Pacific Golf Club, Vista Bahia Stadium Park, San Clemente Municipal Golf Course, SOSB Subunit 1, SOSB Subunit 2, MCB Camp Pendleton San Onofre Recreation Beach, and SOSB Subunit 3.

The Preferred Alternative will not adversely affect access to and from recreation resources in the vicinity of the alignment as shown in Table 2.20-5 with the exception of SOSB Subunit 1. There may be temporary access impacts to this resource during construction of the Preferred Alternative.

During construction of the Preferred Alternative, some short-term dust and construction emissions may result in temporary adverse impacts on adjacent uses, including The Donna O'Neill Land Conservancy, SOSB Subunit 1, and SOSB Subunit 2. Those impacts will be substantially mitigated based on mitigation measures provided in Section 2.4.4. However, these resources could experience substantial adverse short-term air quality impacts, even with mitigation, during construction.

The Preferred Alternative will cross the alignments of the proposed San Juan Creek Trail extension and proposed Cristianitos Trail, which will result in temporary use of the property, if these proposed facilities are operational during construction. The Preferred Alternative will cross one proposed and one existing Class II bikeway, which will result in temporary closure of these bikeways during construction. Sidewalks adjacent to roads crossed by this Alternative would also be temporarily impacted. Considering the proximity of these facilities to the centerline of this Alternative, there could be short-term air quality impacts during construction. The temporary impacts and closures would occur only during construction of the Preferred Alternative at the locations where this Alternative crosses the alignments of these facilities. During these temporary closures, detours for

**Table 2.20-5: Potential Indirect Impacts to Recreation Resources with Implementation of the Preferred Alternative**

| Resource | Indirect Impacts of the Preferred Alternative |
|---|---|
| Tesoro High School | At its closest point, this resource is 117 meters (m) (385 feet [ft]) from the centerline and 30 m (97 ft) from the disturbance limits of the Preferred Alternative. |
| | Noise: This resource would be subject to construction noise and operational noise impacts from this Alternative that would be adverse. This resource would not be subject to adverse pile driving noise impacts. |
| | Air Quality: Based on the distance of this resource from the centerline of this Alternative, the construction of this Alternative is not anticipated to result in short-term adverse air quality impacts on this resource. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative includes a sound wall adjacent to the east side of this resource that would screen current views of a ridge to the east. However, this impact would not be substantially adverse because the active use of this resource would not be affected by a sound wall. |
| General Thomas F. Riley Wilderness Park | At its closest point, this resource is 370 m (1,212 ft) from the centerline and 128 m (421 ft) from the disturbance limits of the Preferred Alternative. |
| | Noise: Based on the distance of this resource from the centerline and intervening topography, this Alternative would not result in adverse operational noise impacts on this recreation resource. Noise from the construction of this Alternative would impact this resource, but not adversely because it would affect an area that does not have frequent human use. This resource would not be subject to adverse pile driving noise impacts. |
| | Air Quality: Based on the distance of this resource from the centerline of this Alternative and intervening topography, the construction of this Alternative is not anticipated to result in short-term adverse air quality impacts on this resource. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative would result in changes in views from this resource. However, those changes would not be adverse because the views would not be substantially changed from existing conditions. |
| The Donna O'Neill Land Conservancy | This Alternative is within the boundary of this resource. |
| | Noise: Construction, pile driving, and operational noise impacts of this Alternative on this resource would not be adverse because the use is open space and therefore only has periodic frequent human use. |
| | Air Quality: Considering the proximity of this resource to the centerline of this Alternative, this resource could potentially experience short-term air quality impacts during construction of this Alternative. |
| | Transportation: Access to this resource is provided by private controlled access from Cristianitos Road that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative would result in changes to views from this resource. Those changes are considered substantially adverse because this Alternative would bring new elements into the viewshed that would reduce the quality of existing views. |

| Resource | Indirect Impacts of the Preferred Alternative |
|---|---|
| Talega Community Park | At its closest point, this resource is 336 m (1,101 ft) from the centerline, 173 m (568 ft) from the disturbance limits, and 238 m (782 ft) from the structures of the Preferred Alternative. |
| | Noise: Based on its distance from the centerline of this Alternative, this resource is outside the 66 Community Noise Equivalent Level (CNEL) contour and would not experience adverse operational noise impacts. The construction and pile driving noise impacts of this Alternative would be adverse. |
| | Air Quality: Based on the distance of this resource from the centerline of this Alternative, the construction of this Alternative is not anticipated to result in short-term adverse air quality impacts on this resource. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative would result in changes in views from this resource. However, those changes would not be adverse because the views would not be substantially changed from existing conditions. |
| Pacific Golf Club | At its closest point, this resource is 387 m (1,271 ft) from the centerline and 7 m (24 ft) from the disturbance limits of the Preferred Alternative. |
| | Noise: Based on its distance from the centerline and structures of this Alternative, this resource is outside the 66 CNEL contour and would not experience adverse operational noise impacts. This resource would be subject to construction and pile driving noise impacts from this Alternative, which would be adverse. |
| | Air Quality: Based on the distance of this resource from the centerline of this Alternative, the construction of this Alternative is not anticipated to result in short-term adverse air quality impacts on this resource. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative would result in changes in views from this resource. However, those changes would not be adverse because the views would not be substantially changed from existing conditions. |
| Vista Bahia Stadium Park | At its closest point, this resource is 388 m (1,273 ft) from the centerline, 199 m (652 ft) from the disturbance limits, and 368 m (1,207 ft) from the structures of the Preferred Alternative. |
| | Noise: Based on its distance from the centerline of this Alternative, this resource is outside the 66 CNEL contour and would not experience adverse operational or construction noise impacts. Construction of this Alternative would result in adverse pile driving noise impacts at this resource. |
| | Air Quality: Based on the distance of this resource from the centerline of this Alternative, the construction of this Alternative is not anticipated to result in short-term adverse air quality impacts on this resource. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative is not visible from this resource due to intervening topography or structures. Therefore, this Alternative would not adversely impact views from this recreation resource. |
| San Clemente Municipal Golf Course | At its closest point, this resource is 286 m (938 ft) from the centerline, 178 m (585 ft) from the disturbance limits, and 253 m (830 ft) from the structures of the Preferred Alternative. |

| Resource | Indirect Impacts of the Preferred Alternative |
|---|---|
| | Noise: Based on its distance from the centerline of this Alternative, this resource is outside the 66 CNEL contour and would not experience adverse operational noise impacts. Construction of this Alternative would result in adverse construction and pile driving noise impacts at this resource. |
| | Air Quality: Based on the distance of this resource from the centerline of this Alternative and intervening topography, the construction of this Alternative is not anticipated to result in short-term adverse air quality impacts on this resource. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative is not visible from this resource due to intervening topography or structures. Therefore, this Alternative would not adversely impact views from this recreation resource. |
| Proposed South San Clemente Neighborhood Park (east) | At its closest point, this resource is 305 m (1,002 ft) from the centerline and 171 m (560 ft) from the disturbance limits of the Preferred Alternative. |
| | Noise: This proposed resource would not be subject to adverse operational, construction, or pile driving noise impacts from this Alternative because it is a proposed resource and the noise standards do not apply. |
| | Air Quality: Based on the distance of this resource from the centerline of this Alternative and intervening topography, the construction of this Alternative is not anticipated to result in short-term adverse air quality impacts on this resource. |
| | Transportation: Access to this resource is provided by local streets which will not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative will not adversely impact access to this recreation resource. |
| | Visual: This Alternative is not visible from this resource due to intervening topography or structures. Therefore, this Alternative would not adversely impact views from this recreation resource. |
| SOSB Subunit 1 | This Alternative is within the boundary of this resource. |
| | Noise: This resource would be subject to construction, pile driving, and operational noise impacts from this Alternative, which would be adverse. |
| | Air Quality: Considering the proximity of this resource to the centerline of this Alternative, this resource could potentially experience short-term air quality impacts during construction of this Alternative. |
| | Transportation: This resource could potentially experience short-term adverse access impacts during construction. |
| | Visual: This Alternative will result in changes to views from this resource. Those changes are considered substantially adverse because this Alternative would bring new elements into the viewshed that would reduce the quality of existing views. |
| SOSB Subunit 2 | Noise: This resource would be subject to pile driving and construction noise impacts from this Alternative, which would be adverse. This resource would not be subject to operational impacts because of the design of the Alternative. |
| | Air Quality: Considering the proximity of this resource to the centerline of this Alternative, this resource could potentially experience short-term air quality impacts during construction of this Alternative. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative would result in changes in views from this resource. However, those changes would not be adverse because the views would not be substantially changed from existing conditions. |

| Resource | Indirect Impacts of the Preferred Alternative |
|---|---|
| MCB Camp Pendleton San Onofre Recreation Beach | At its closest point, this resource is 56 m (183 ft) from the centerline, 19 m (63 ft) from the disturbance limits, and 32 m (104 ft) from the structures of the Preferred Alternative. |
| | Noise: This resource would be subject to adverse construction, pile driving, and operational noise impacts from this Alternative. |
| | Air Quality: Based on the distance of this resource from the centerline of this Alternative and intervening topography, the construction of this Alternative is not anticipated to result in short-term adverse air quality impacts on this resource. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative would result in changes in views from this resource. However, those changes would not be adverse because the views would not be substantially changed from existing conditions. |
| SOSB Subunit 3 | At its closest point, this resource is 175 m (575 ft) from the centerline and 124 m (408 ft) from the disturbance limits of the Preferred Alternative. |
| | Noise: This Alternative would not have any operational impacts on this resource under the FEC-M Ultimate configuration. This resource would be subject to adverse construction noise impacts from this Alternative. This resource would not be subject to adverse pile driving noise impacts. |
| | Air Quality: Based on the distance of this resource from the centerline of this Alternative, the construction of this Alternative is not anticipated to result in short-term adverse air quality impacts on this resource. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative would result in changes in views from this resource. However, those changes would not be adverse because the views would not be substantially changed from existing conditions. |

Source: P&D Consultants (2003).

these facilities would be provided in consultation with the jurisdiction in which they are located, to the extent feasible to ensure public safety during construction. If proposed facilities are not in operation during construction of the selected Alternative, there will be no impacts; therefore, the Transportation Corridor Agencies (TCA) will not have any mitigation responsibility.

**Permanent Impacts.** As shown in Figure 2.20-1, the Preferred Alternative will result in the permanent acquisition of land from The Conservancy located outside the Coastal Zone. Implementation of the Preferred Alternative would require acquisition of approximately 62 ha (154 ac) of the 520 ha (1,284 ac) Conservancy resulting in an adverse impact to this open space resource.

SOSB Subunit 1 would be adversely impacted by acquisition of an easement of approximately 117 ha (290 ac) of the 564 ha (1,393 ac) subunit for right-of-way and construction of the corridor, pending further investigation and clarification of lease boundaries. Additionally, approximately 17 ha (41 ac) of land would be temporarily affected due to construction staging activities. The Department of the Navy (DON) reserved the right to grant easements for transportation corridor right-of-way in the lease to the State Parks Department. The TCA will acquire an easement from the Navy. None of the 101 campsites will be acquired, and a noise wall will be implemented.

Use of a small area in SOSB Subunit 2 is necessary for implementation of the project. Affected areas are adjacent to existing I-5, are not active use areas within SOSB, and all of SOSB is on MCB Camp Pendleton and owned by the DON. As noted above, the DON reserved the right to grant easements for transportation corridor right-of-way in the lease to the State Parks Department. The TCA will acquire an easement from the Navy, if necessary.

As shown in Figure 2.20-1 and Table 2.20-5, the Preferred Alternative will transect SOSB Subunit 1, SOSB Subunit 2, and The Conservancy. The Preferred Alternative will transect SOSB Subunit 1, resulting in a trail crossing from the City of San Clemente onto SOSB Subunit 1 being located on the west side of the corridor and the San Mateo Campground remaining on the east side of the corridor. The corridor disturbance and right-of-way limits will result in the removal of the RV tank pumping station and several fire roads in the north part of SOSB Subunit 1, outside the Coastal Zone. The design of the Preferred Alternative includes structures (wildlife crossings and utility maintenance access roads) in SOSB Subunit 1 that would allow park users to cross between the east and west sides of the park under the corridor.

The Preferred Alternative will divide The Conservancy, with parts of The Conservancy on the east and west sides of the corridor. The corridor disturbance and right-of-way limits will result in the removal of open space and trails in the north part of The Conservancy. The design of this Alternative includes structures over Cristianitos Road and another private road that will allow The Conservancy users to cross between the east and west sides of the corridor. Portions of several trails are within the disturbance limits of the Preferred Alternative, but outside the Coastal Zone, including North Ridge, Shady Canyon, Middle Ridge, High Ridge Trails, Meadow cut-off, and two roads, including Gato Canyon Road and Back Road. The trails map of The Conservancy was provided after publication of the Draft Environmental Impact Statement (EIS)/SEIR (see Attachment 9 of the Final SEIR Response to Comments document). The map provided by The Conservancy is not to scale; therefore, it is not possible to make a precise calculation of the linear impacts to trails. The Conservancy trails are under private ownership and are available to the public on an appointment basis for docent-led hikes.

As shown on Table 2.20-5, adverse noise impacts due to operation of the Preferred Alternative will occur at Tesoro High School and SOSB Subunit 1.

The Preferred Alternative will not permanently adversely affect access to and from recreation resources in the vicinity of the alignment as shown on Table 2.20-5 with the exception of brief periods of temporary disruption during construction. Permanent access is provided in the design and right-of-way for the Preferred Alternative. The Preferred Alternative will not permanently remove any access to recreation resources.

Operation of the Preferred Alternative would not result in substantial adverse long-term local air quality impacts to recreation resources based on the findings of the Air Quality Technical Report.

As shown in Table 2.20-5, the Preferred Alternative will result in adverse changes in views from The Conservancy and SOSB Subunit 1. The Preferred Alternative would also result in adverse changes in views to the resources listed above (SOSB Subunit 1, SOSB Subunit 2, and The Conservancy). Project refinements, however, have resulted in a reduction in the number of utility poles/towers near the entrance to the San Mateo Campground on SOSB Subunit 1. While some of the new infrastructure that will be constructed as part of the project may be of greater height than what currently exists, project changes will reduce the overall visual clutter in this area by reducing the total number of poles and towers.

The Preferred Alternative will result in changes in views from Tesoro High School sports fields, General Thomas F. Riley Wilderness Park, Caspers Regional Park, Talega Community Park, Pacific Golf Club, SOSB Subunit 2, and MCB Camp Pendleton Green Beach and San Onofre Recreation Beach. The change in the views from these resources is not adverse because either the views from these resources would not be substantially changed or these resources are not considered to be sensitive to changes in the viewshed.

Views from the proposed trails and the Ladera Ranch Open Space Trail would be substantially affected by this Alternative and would be considered an adverse impact. The Preferred Alternative would have visual impacts to the proposed Prima Deshecha Trail and the existing Rancho San Clemente Ridgeline Trail, but these impacts are not considered to be adverse because the views would not be substantially changed from existing conditions. These resources are located outside the Coastal Zone.

The Preferred Alternative will cross the alignments of the proposed San Juan Creek Trail Extension and proposed Cristianitos Trail, which will result in permanent acquisition along portions of these trails if these proposed facilities are operational during construction of the Preferred Alternative. This would be an adverse impact on these proposed trails. In addition, the views from these trails would be substantially affected by the Preferred Alternative and this would be considered an adverse impact. These resources are located outside the Coastal Zone.

The Preferred Alternative would not result in long-term adverse impacts to Class II and III on-road bicycle facilities and sidewalks because these facilities would be reopened after temporary construction closures.

The proposed project refinements at Basilone Road are north of I-5 and do not have any short-term effects to coastal recreation resources. Similarly, the proposed refinements at MCB Camp Pendleton Green Beach are located in an area of active military use and will not result in additional short-term impacts to coastal recreation resources.

### Impacts in Coastal Zone

Recreation uses in the Coastal Zone are limited to SOSB lease areas and MCB Camp Pendleton San Onofre Recreation Beach.

**Temporary Impacts.** As shown on Table 2.20-6, temporary adverse construction noise impacts of the Preferred Alternative within the Coastal Zone will occur at SOSB Subunit 2, MCB Camp Pendleton San Onofre Recreation Beach, and SOSB Subunit 3.

During construction of the Preferred Alternatives, some short-term dust and construction emissions may result in temporary adverse impacts on the SOSB Subunit 2. Those impacts will be substantially mitigated based on mitigation measures provided in Section 2.4.4. However, this resource could still experience substantial adverse short-term air quality impacts, even with mitigation, during construction.

An existing trail connecting SOSB Subunits currently provides access to the beach from upland areas on the other side of I-5, including the San Mateo Campground. This trail, which along many segments is currently a dirt trail, splits into two routes at a point north of I-5. One trail route crosses below the I-5 at the San Mateo Creek Bridge. The other trail route crosses over the I-5 along the existing Cristianitos Overcrossing.

During construction of FTC-S, portions of the trail north of the trail split will be rerouted within the disturbance limits of the project. In this area, portions of the trail that are now dirt will be reconstructed with a sidewalk.

The trail route that crosses I-5 via the Cristianitos Overcrossing will remain open throughout construction so that at no time will pedestrian beach access from the north side of I-5 be discontinued. The trail route that crosses below I-5 at the San Mateo Creek Bridge will be closed on a temporary basis to accommodate the construction and removal of falsework. Shorter periods of closure may also be required during specific construction activities in order to provide pedestrian safety, such as during concrete pours. At completion of FTC-S, both routes will remain open for pedestrian access to the beach.

**Permanent Impacts.** Minimal use of recreation land in the Coastal Zone is anticipated to be required as a result of the proposed project. The proposed project transects a small portion of SOSB Subunit 1 and Subunit 2 in the Coastal Zone. Both lease areas are owned by DON, which reserved the right to grant easements for transportation corridor right-of-way. Any use of this area by the project would be adjacent to existing I-5 in the Coastal Zone. Therefore, the Preferred Alternative would not fragment or permanently adversely affect access to and from any recreation resources within the Coastal Zone.

## Table 2.20-6: Potential Indirect Impacts on Recreation Resources with Implementation of the Preferred Alternative

| Resource | Indirect Impacts of the Preferred Alternative |
|---|---|
| SOSB Subunit 2 | Noise: This resource would be subject to pile driving and construction noise impacts from this Alternative, which would be adverse. This resource would not be subject to operational impacts because of the design of the Alternative. |
| | Air Quality: Considering the proximity of this resource to the centerline of this Alternative, this resource could potentially experience short-term air quality impacts during construction of this Alternative. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative will result in changes in views from this resource. However, those changes would not be adverse because the views would not be substantially changed from existing conditions. |
| MCB Camp Pendleton San Onofre Recreation Beach | At its closest point, this resource is 56 m (183 ft) from the centerline, 19 m (63 ft) from the disturbance limits, and 32 m (104 ft) from the structures of the Preferred Alternative. |
| | Noise: This resource would be subject to adverse construction and pile driving noise impacts from this Alternative. |
| | Air Quality: Based on the distance of this resource from the centerline of this Alternative and intervening topography, the construction of this Alternative is not anticipated to result in short-term adverse air quality impacts on this resource. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative will result in changes in views from this resource. However, those changes would not be adverse because the views would not be substantially changed from existing conditions. |
| SOSB Subunit 3 | At its closest point, this resource is 175 m (575 ft) from the centerline and 124 m (408 ft) from the disturbance limits of the Preferred Alternative. |
| | Noise: This Alternative would not have any operational impacts on this resource. This resource would be subject to adverse construction noise impacts from this Alternative. This resource would not be subject to adverse pile driving noise impacts. |
| | Air Quality: Based on the distance of this resource from the centerline of this Alternative, the construction of this Alternative is not anticipated to result in short-term adverse air quality impacts on this resource. |
| | Transportation: Access to this resource is provided by local streets that would not be adversely impacted during construction and operation of this Alternative. Therefore, this Alternative would not adversely impact access to this recreation resource. |
| | Visual: This Alternative will result in changes in views from this resource. However, those changes would not be adverse because the views would not be substantially changed from existing conditions. |

Source: P&D Consultants (2003).

Operation of the Preferred Alternative would not result in substantial adverse long-term local air quality or visual impacts to recreation resources. The Preferred Alternative will result in changes in views from the SOSB Subunit 2 and MCB Camp Pendleton Green Beach. The change in the views from these resources is not adverse because the views from these resources either would not be substantially changed or these resources are not considered to be sensitive to changes in the viewshed.

The proposed project refinements at Basilone Road are north of I-5 and do not have any long-term effects to coastal recreation resources. Similarly, the proposed refinements at MCB Camp Pendleton Green Beach are located in an area of active military use and will not result in additional long-term impacts to coastal recreation resources.

## 2.20.4 MITIGATION

The following mitigation measures were developed to avoid or minimize the impacts of the Preferred Alternative related to recreation resources. They are also included in the Mitigation Monitoring and Reporting Program (Appendix A).

**Measure R-1:** **Avoidance of the Temporary Occupancy and/or Permanent Acquisition of Recreation Resources Property.** During final design, the TCA or the implementing agency/agencies will refine the design to the extent feasible based on engineering judgment and design standards to avoid or minimize the temporary occupancy during construction and the permanent acquisition of land currently occupied by or proposed for use by recreation resources. In the event that the temporary occupancy or permanent acquisition of this land cannot be avoided through design refinements, other mitigation measures identified for the compensation of temporary and permanent use of recreation resources land will apply to the build Alternatives consistent with Uniform Relocation Assistance.

**Measure R-2:** **Consultation with Owners/Operators of Recreation Resources.** In conjunction with measures R-3 and R-4 (compliance with the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970, refer to Section 4.6), the TCA or implementing agency/agencies will consult with the affected land owner/operator of recreation resources temporarily used or permanently acquired by a build Alternative. The purposes of this consultation will be to:

- Identify and implement opportunities to protect recreation resources in place.
- Identify and implement opportunities to replace lost recreation facilities within the existing recreation land.
- Combine compensation and protection/modification of affected recreation resources to comply with the Uniform Relocation Assistance Act and minimize adverse impacts on recreation resources.

**Measure R-3:** **Direct Permanent Impacts (Property Acquisition) at Recreation Resources.** Consistent with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, the TCA or implementing agency/agencies will negotiate with the owner/operator whose recreation facilities

will be permanently acquired to determine appropriate action and/or compensation to mitigate for the permanent acquisition.

**Measure R-4: Direct Temporary Impacts (Occupancy of Property During Construction) on Recreation Resources.** Consistent with requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, the TCA or implementing agency/agencies will negotiate with the owner/operator whose recreation facilities will be temporarily occupied during construction to determine appropriate action and or compensation to mitigate for the temporary occupancy.

## 2.20.5 CONCLUSION

Temporary adverse construction noise impacts of the Preferred Alternative within the Coastal Zone will occur at SOSB Subunit 2, MCB Camp Pendleton San Onofre Recreation Beach, and SOSB Subunit 3. Short-term dust and construction emissions may result in temporary adverse air quality impacts on the SOSB Subunit 2.

Trails providing access to the Coastal Zone will be temporarily closed at specific locations for short periods of time during construction activities. Any necessary trail re-routing will be accomplished within the disturbance limits of the project.

The mitigation measures presented in this section as well as in Sections 2.4 (Noise) and 2.5 (Air Quality) will help to minimize adverse impacts to the Coastal Zone resulting from construction and operation of the Preferred Alterative. As discussed in Section 2.5, the short-term construction emissions as a result of the Preferred Alternative with mitigation measures would be substantially reduced but cannot be mitigated to below a level of significance.

The proposed project will transect a small area within SOSB Subunit 1 and Subunit 2 in the Coastal Zone. The potentially affected areas are adjacent to I-5, are not active use areas, and are subject to the provisions of the lease with DON, which reserves the right to grant easements for transportation corridor right-of-way.

# APPENDIX A

# MITIGATION MONITORING AND REPORTING PROGRAM

# MITIGATION MONITORING AND REPORTING PROGRAM

Public Resources Code Section 21081.6 (enacted by the passage of Assembly Bill 3180) mandates that a public agency approving a project for which an EIR has been prepared under CEQA must also adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment. The reporting or monitoring program must be designed to ensure compliance with project conditions/mitigation during implementation of the project.

The mitigation monitoring and reporting program for the Proposed Project (Preferred Alternative) has been prepared in compliance with Public Resources Code Section 21081.6. It describes the requirements and procedures to be followed by the TCA and FHWA to ensure that all mitigation measures adopted as part of the Proposed Project will be carried out as described in this EIS/SEIR.

The following table lists each of the mitigation measures specified in this EIS/SEIR and identifies the party or parties responsible for implementation and monitoring of each measure.

Due to the location of the Preferred Alternative within development areas of the Rancho Mission Viejo ("RMV") Ranch Plan, mitigation may be planned by both TCA and RMV for the same areas of ground disturbance. If there is a possibility of an overlap of mitigation, TCA and RMV will coordinate their efforts such that mitigation won't be duplicated.

The TCA SEIR 4 mitigation measures include several measures that are exactly the same, or substantially the same, for different impacts identified in this Final EIS/SEIR. This occurs because biological resources were organized into a general section for wildlife and vegetation, and a separate section for threatened and endangered species. The mitigation measures were listed separately for those two topics, even where the measures are the same or substantially the same and address the same impact. As TCA staff implements the mitigation measures, they may consolidate these measures.

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| **Mitigation Measures Related to Traffic and Circulation** | | |
| **Measures for Short Term Construction Impacts** | | |
| Measure CT-1. A Construction Traffic Management Plan (CTMP) will be developed during final design by the TCA. The CTMP will include, but not be limited, to:<br>• Identification of designated haul routes in consultation with the affected local jurisdictions.<br>• Limiting construction truck and haul traffic to designated routes only.<br>• Public information and promotional activities including distribution of newsletters, brochures, 24-hour information hot line and press releases. The TCA will coordinate with businesses adjacent to the construction areas and prepare plans for improving carpooling, transit and other shared ride services.<br>• The use of fast track construction techniques to speed construction times.<br>• Construction scheduling (start/stop times, major materials deliveries, export hauling, etc.) should be scheduled to avoid AM and PM peak traffic periods on adjacent streets to the extent feasible, so that the majority of construction related traffic occurs outside of peak commuting times.<br>• Identification of alternative routes and routes across the construction areas for emergency and school vehicles developed in coordination with the affected agencies.<br>• Changeable message boards and alternative route signs should be used.<br>• Identification of additional traffic enforcement (increased patrols), as needed to ensure public safety in the vicinity of construction areas and detour routes. | TCA | During final design and ongoing during construction |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| • Coordination and implementation of improved/modified signal timing and synchronization at intersections near the construction area and along routes adversely affected by construction traffic.<br>• Installation of visual barriers or paddle screens around construction areas to help reduce "rubbernecking" by travelers.<br>• Coordinate with Caltrans and local agencies to ensure that signage for haul routes, detour routes and public information is consistent. | | |
| **Mitigation Measures Related to Land Use** | | |
| Measure LU-1: Impacts on Existing Land Uses. Design refinements to avoid or minimize impacts to existing land uses, related to the temporary use and/or permanent acquisition of property, will be incorporated in the final design of the selected Alternative, where prudent and feasible. | TCA | During final design |
| **Mitigation Measures and Commitments Related to Farmland** | | |
| Measure AG-1: Existing Operations on RMV. During final design, and in coordination with RMV and its agricultural leaseholders, the contractor will finalize the realignments of access roads on the ranch to provide cattle and equipment crossings to minimize impediments to cattle movement and routine agricultural operations and normal business activities. | Contractor, with oversight by TCA | During final design |
| Measure AG-2: Existing Operations on RMV. Prior to the start of any construction activities, any corrals and/or windmills within the disturbance limits of a SOCTIIP build Alternative will be relocated or replaced. In the event that the RMV or the leaseholder does not want the facility relocated, appropriate compensation for the facility will be provided. | TCA | Prior to start of construction |
| Commitment AGC-1: Existing Operations on RMV. Prior to the start of any construction activity, written notification will be provided to agricultural property owners or leaseholders immediately adjacent to the disturbance limits for the SOCTIIP build Alternative. The notification is to indicate the intent to begin construction, including an estimated date for the start of construction. This notification shall be provided at least three, but no more than 12, months prior to | Contractor, with direction/oversight by TCA | At least 3 months and no more than 12 months prior to the start of construction activity |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| the start of construction activity. | | |
| **Mitigation Measures Related to Socioeconomics** | | |
| Measure SE-1: Avoidance of the Temporary Use and/or Permanent Acquisition of Residential and Non-Residential Property. During final design, the TCA will refine the design to the extent feasible based on engineering judgment and design standards to avoid or minimize the permanent acquisition of land currently occupied by residential and non-residential users. In the event that the temporary use or permanent acquisition of this property cannot be avoided through design refinements, other mitigation measures identified for the compensation of temporary and permanent use of residential and non-residential property will apply to the build Alternatives. | TCA | During final design |
| Measure SE-2: Property Acquisition and Relocation Assistance. Prior to acquisition of right of way, the TCA will comply with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 in the acquisition of all property within the right-of-way necessary for the proposed project. All displaced households and businesses will be contacted to ensure that each eligible displacee receives their full relocation benefits, including advisory assistance, and that all activities will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources will be available to all eligible displaced persons or businesses without discrimination. TCA will also comply with the Public Park Preservation Act as applicable. | TCA | Prior to acquisition of right-of-way |
| Measure SE-3: Replacement Housing Program. Measure SE-3 is not applicable to the Preferred Alternative. | N/A | N/A |
| **Mitigation Measures Related to Pedestrian and Bicycle Facilities** | | |
| Measure R-1: Avoidance of the Temporary Occupancy and/or Permanent Acquisition of Recreation Resources Property. During final design, the TCA will refine the design to the extent feasible based on engineering judgment and design standards to avoid or minimize the temporary occupancy during construction and the permanent acquisition of land currently occupied by or proposed for use by recreation resources. In the event that the temporary | TCA | During final design |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| occupancy or permanent acquisition of this property cannot be avoided through design refinements, other mitigation measures identified for the compensation of temporary and permanent use of recreation resources property will apply to the build Alternatives consistent with Uniform Relocation Assistance. | | |
| Measure R-2: Consultation with Owners/Operators of Recreation Resources. In conjunction with measures R-3 and R-4 (compliance with the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970, refer to Section 4.6), the TCA will consult with the affected property owner/operator of recreation resources temporarily used or permanently acquired by a build Alternative. The purposes of this consultation will be to:<br>• Identify and implement opportunities to protect recreation resources in place.<br>• Identify and implement opportunities to replace lost recreation facilities within the existing recreation property.<br>• Combine compensation and protection/modification of affected recreation resources to comply with the Uniform Relocation Assistance Act and minimize adverse impacts on recreation resources. | TCA | Prior to acquisition of right-of-way |
| Measure R-3: Direct Permanent Impacts (Property Acquisition) at Recreation Resources. Consistent with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, the TCA will negotiate with the owner/operator whose recreation facilities will be permanently acquired to determine appropriate action and/or compensation to mitigate for the permanent acquisition. | TCA | Prior to acquisition of right-of-way |
| Measure R-4: Direct Temporary Impacts (Occupancy of Property During Construction) on Recreation Resources. Consistent with requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, the TCA will negotiate with the owner/operator whose recreation facilities will be temporarily occupied during construction to determine appropriate action | TCA | Prior to acquisition of right-of-way |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| and or compensation to mitigate for the temporary occupancy. | | |
| Measure R-5: Impacts on Trails. During final design, the TCA will provide for crossings of planned lateral Class I and existing and planned Class II bicycle trails, as well as hiking and equestrian trails at master planned locations across the road alignments. These trail crossings will be designed and constructed according to the standards of Caltrans and the applicable local agency with responsibility for the trail, as appropriate. Construction plans will include directions to contractors related to minimizing potential disruptions to existing bicycle, riding and hiking trails during construction, as feasible. | TCA | During final design |
| **Mitigation Measures Related to Noise** | | |
| **Mitigation Measures for Construction Noise Impacts** | | |
| Measure N-1: Local Control of Construction Hours. During construction, the construction contractor will be responsible for limiting hours of construction in a manner consistent with the Orange County Noise Ordinance. This Ordinance prohibits construction and grading activities during the hours of 8:00 PM and 7:00 AM on weekdays and Saturdays, or at any time on Sunday or a Federal holiday in circumstances where the ordinance noise standards may otherwise be exceeded. The impact analysis indicates that the restriction of construction hours would typically occur when pile driving is within 850 m (2,800 ft) of noise sensitive land uses, heavy grading occurs within 1,500 m (5,000 ft) of noise sensitive land uses, and when general construction occurs within 275 m (900 ft) of noise sensitive land uses. However, these distances are only a guide due to the large variation in construction activities. In all cases, compliance with the Orange County Noise Ordinance and/or any applicable City Noise Ordinance is the critical requirement. However, there may be a potential need to conduct nighttime pile driving during construction of corridor Alternatives that have a direct connection with I-5 and the Alternatives which widen I-5. Where proposed pile driving for I-5 requires a lane closure, it is anticipated that this work will need to be performed at night to minimize associated traffic congestion. Nighttime pile driving will only be allowed on review of the construction plans for the corridor Alternatives by the TCA for the other | Contractor | During construction |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| Alternatives by the implementing agency to confirm that appropriate noise attenuation measures are in place, including appropriate notification of the public. Any project construction activities planned between 7:00 PM and 7:00 AM on MCB Camp Pendleton will require approval from the TCA in consultation with the Commanding General of Camp Pendleton. For any portion of this project that may be constructed on MCB Camp Pendleton in San Diego County (outside the area of jurisdiction of the Orange County Noise Ordinance or outside the area of jurisdiction of San Clemente's Noise Ordinance), approval of the planned hours of construction, including any need to perform nighttime pile driving, will rest solely with the Commanding General of Camp Pendleton. | | |
| Measure N-2: Construction Equipment. During construction activities, the construction contractor will ensure that the construction vehicles and equipment shall be maintained properly in tune as required by local ordinances. Additionally, each internal combustion engine used on the job shall be equipped with a "residential" or "hospital" grade muffler. | Contractor | During construction |
| Measure N-3: Schools Adjacent to Construction Zone. Prior to construction activities in the vicinity of any school, the construction contractor shall be responsible for developing an agreement with Fallbrook Union Elementary School District, Camp Pendleton and private school operators, as appropriate, that would mitigate construction noise levels in classrooms and playfields at the affected schools to an agreed to construction noise performance standard. Each agreement shall be completed prior to the initiation of any grading on construction within 600 m (2,000 ft) of the school grounds. Examples of noise mitigation options include construction of temporary soundwalls, and limitation of some of the noisiest construction activities to periods when the schools are closed (e.g., the summer for the two public schools). | Contractor | Prior to construction |
| Measure N-4: Haul Routes. Prior to construction activities, the construction contractor shall establish haul routes that avoid passing through or adjacent to residential and school areas to the extent feasible. In general, truck routes should be directed away from residential areas and onto the I-5 to minimize the construction truck intrusion. If haul routes must pass through residential areas, | Contractor | Prior to construction |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| haul route traffic should be limited to daytime hours (7 AM to 8 PM). The haul routes will be developed in conjunction with the applicable local jurisdictions. | | |
| Measure N-5: Nighttime Demolition. Measure N-5 is not applicable to the Preferred Alternative | N/A | N/A |
| Measure N-6: Noise Complaint Officer. Prior to construction activities, the construction contractor shall identify a Noise Complaint Officer and establish a Noise Complaint hotline. The Noise Complaint Hotline shall be able to receive calls on a 24 hour basis. Any complaints regarding construction shall be forwarded to the Noise Complaint Officer. The Noise Complaint Officer shall record the general description of the complaint, the time the offending noise occurred and the location of the complaint. The Officer shall attempt to measure the noise that generated the complaint within the following 24 hours. If the noise levels exceed those allowed during nighttime construction activities under the local Noise Ordinance, or activities are occurring that are inconsistent with the noise mitigation measures, then the construction contractor shall be responsible for correcting those problems within the following 48 hours. The noise levels measured and any corrective actions shall be recorded with the original complaint form. | Contractor | Prior to construction |
| **Mitigation Measures for Long Term Noise Impacts** | | |
| Measure N-7: Final Noise Analysis. During final design, the TCA will prepare a final noise analysis based on the detailed and finalized design developed during final design. Feasibility considerations for each sound barrier must meet FHWA/Caltrans criteria including a minimum of 5 dB of noise reduction at the impacted receiver. Additional feasibility considerations are (1) topography, (2) access requirements for driveways, ramps, etc; (3) the presence of cross streets, (4) other noise sources in the area and (5) safety considerations. The TCA will finalize noise mitigation requirements for the selected Alternative and coordinate design with the local agency. As appropriate, the Final Noise Assessment Technical Report and the sound barrier/berm height recommended in the Final Noise Assessment Technical Report will serve as a guideline in determining the final barrier height requirements. Other pertinent information | TCA | During final design |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| from the Final Noise Assessment Technical Report will be incorporated into final design as appropriate. The Final Noise Assessment Technical Report will provide specific recommendations that will then be incorporated into the Construction documentation (i.e. final design) for building purposes. | | |
| Measure N-8: Long Term Noise Impacts. During construction, the TCA shall implement permanent sound barriers, including walls, berms or combinations of walls and berms. The sound barrier and/or supplemental berm must provide a minimum of 5 dB of noise reduction at the impacted receiver as refined during final design. The locations of these proposed sound barrier/berms are shown on Figures by Alternative in Appendix K. The construction contractor will be responsible for constructing the sound barrier/berm for the selected Alternative and as refined during final design. As appropriate, the Final Noise Assessment Technical Report will be reviewed and the sound barrier/berm height recommended in the Final Noise Assessment Technical Report will serve as a guideline in determining the final barrier height requirements. Other pertinent information from the Final Noise Assessment Technical Report will be incorporated into final design as appropriate. The Final Noise Assessment Technical Report provides specific recommendations that ate then translated into the construction documentation (i.e., final design) for build purposes. The design and specifications of the sound walls, shown on Figures 5.2-79 through 5.2-82 (Appendix K of the Draft EIS/SEIR), on MCB Camp Pendleton shall be approved by the Commanding General of Camp Pendleton. | TCA | During construction |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| **Commitments Related to Long-Term Noise Impacts** | | |
| Commitment NC-1: Determination of Reasonableness. During final design, the TCA shall determine the reasonableness of soundwall/berm placement and consider the life cycle of the sound barrier, the potential environmental impact of the mitigation, opinions of impacted residents, input from the public and local agencies, and social, economic and environmental factors consistent with the FHWA/Caltrans feasibility criteria. | TCA | During final design |
| Commitment NC-2: Soundwall/Floodplain. During final design, if the TCA locates a soundwall/berm in a floodplain, the TCA shall prepare an evaluation of the effects of the soundwall on the floodplain in accordance with appropriate guidelines and design manuals. The design and location will be determined to ensure there is no exceedance of the one foot elevation of the base floodplain. Early recognition and analysis of potential problem areas will be made to determine if wall openings or staggered wall openings are viable for those barriers. | TCA | During final design |
| **Mitigation Measures Related to Air Quality** | | |
| **Mitigation Measure for Short-Term Air Quality Impacts** | | |
| Measure AQ-1. During construction, contractor specifications shall incorporate directions to contractors to control fugitive dust. Fugitive dust shall be controlled by regular watering, paving construction roads, or other dust preventive measures, as defined in SCAQMD Rule 403.<br><br>After clearing, grading, earth moving or excavation the following activities will be performed by the construction contractor:<br>a. Seeding and watering will be performed until viable vegetation cover is in place in inactive areas.<br>b. Soil binders will be spread.<br>c. Areas will be wet down sufficiently to form a crust on the surface. Repeated soakings will be performed as necessary to maintain this crust.<br>d. Reduce speeds to 10 to 15 mph in construction zones on unpaved areas. | Contractor | During construction and after clearing, grading, earth moving or excavation |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| Measure AQ-2. During construction, measures contained in Tables 1 and 2 of SCAQMD Rule 403 will be implemented by the construction contractor. Control of particulate emissions from construction activities is best controlled through the requirements contained in SCAQMD's Rule 403, Tables 1 and 2. Tables 1 and 2 are reproduced here as Figures 4.7-5, 4.7-6 and 4.7-7. The measures contained in these tables are presented as an option to air quality monitoring in Rule 403. Figure 4.7-5 contains measures such as maintaining an adequate moisture content in the soil, watering grading areas, establishing ground cover in inactive areas and watering unpaved roads. Figures 4.7-6 and 4.7-7 identify additional measures that are applied during high wind conditions. The mitigation measure, therefore, is to require that the measures contained in Tables 1 and 2 of Rule 403 be utilized. This potentially results in a much higher reduction of particulate emissions than if the air monitoring option contained in Rule 403 was employed. The air monitoring option requires monitoring around the project site, and as long as pollutant levels do not exceed threshold limits, no pollutant emission reduction measures are employed. The measure would be triggered prior to the initiation of grading. | Contractor | During construction |
| Measure AQ-3. During construction, the contractor shall be responsible for sweeping all public streets adjacent to the project site once a day if visible soil materials are carried to adjacent streets (recommend water sweepers with reclaimed water). This condition would apply to those areas where construction traffic leaves the project site and travels onto public roadways. | Contractor | During construction |
| Measure AQ-4. During construction, the contractor shall be responsible for installing wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash trucks and any equipment leaving the site each trip. | Contractor | During construction |
| Measure AQ-5. During final design, contractor specifications shall require that contractors implement the following measures:<br>• Use low emission mobile construction equipment.<br>• Maintain construction equipment engines by keeping them tuned.<br>• Use low sulfur fuel for stationary construction equipment. This is required | Contractor | During final design and construction |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| by SCAQMD Rules 431.1 and 431.2.<br>• Utilize existing power sources (i.e., power poles) when feasible. This measure would minimize the use of higher polluting gas or diesel generators.<br>• Configure construction parking to minimize traffic interference.<br>• Minimize obstruction of through-traffic lanes. When feasible, construction should be planned so that lane closures on existing streets are kept to a minimum.<br>• Schedule construction operations affecting traffic for off-peak hours.<br>• Develop a traffic plan to minimize traffic flow interference from construction activities (the plan may include advance public notice of routing, use of public transportation and satellite parking areas with a shuttle service).<br>• Include in construction grading plans a statement that work crews shut off equipment when not in use.<br>• Support and encourage ridesharing and transit incentives for the construction crew. | | |
| Measure AQ-6. During construction, any material deposited onto paved roads due to a major storm event must be removed within 72 hours of the event by the contractor. Additional time is allowed for mudslides or similar events that block traffic over the material. In the event of road closures due to mudslides or other overwhelming accumulations of material, public access should be restricted until all the material is removed. | Contractor | During construction |
| **Mitigation Measures for Long Term Air Quality Impacts** | | |
| Measure AQ-7. During construction, the contractor shall be responsible for implementing a control measure which specifies three "preventive" and one "mitigative" control option(s) that would be mandatory of all unpaved road | Contractor | During construction |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| connections with paved public roads. The four mandatory control options include:<br>• Paving the last 100 feet from an unpaved roadway connection with a paved road;<br>• Chemical stabilization of the last 100 feet from an unpaved roadway connection with a paved road at sufficient frequency and concentration to maintain a stabilized surface at all times.<br>• Installation of dirt removal devices (e.g., tire cleaning device, grizzlies, etc.);<br>• Cleaning of public paved road surface at any time visible track-out occurs. | | |
| **Mitigation Measures Related to Floodplains, Waterways, and Hydrologic Systems** | | |
| Mitigation measures concerning impacts to floodplains, waterways and hydrologic systems are measures WQ-1 to WQ-4. Refer to Section 8.9 (Mitigation Measures Related to Water Quality) for a description of these measures. | See Measures WQ-1 to WQ-4 from Section 8.9 | See Measures WQ-1 to WQ-4 from Section 8.9 |
| **Mitigation Measures Related to Water Quality** | | |
| Measure WQ-1: Preservation of Adjacent Existing Vegetation. The TCA will preserve to the extent feasible existing vegetation at areas on the construction site where either no construction activity is planned or where it will occur at a later date. The vegetation will be preserved according to the California Storm Water BMPs Municipal Handbook (1993) as listed in the RMP. | TCA | During construction |
| Measure WQ-2: Construction Site BMPs. The TCA will implement construction site BMPs as appropriate, during construction of the SOCTIIP Alternatives. These BMPs are described in the California Best Management Practice Handbooks for Construction (1993, revision pending), Caltrans, SWMP and Storm Water Quality Handbooks. BMP categories include measures for temporary sediment control, temporary soil stabilization, scheduling, preservation of existing vegetation, conveyance controls, wind control, | TCA | During construction |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| temporary stream crossings and waste management as well as many other measures which may be implemented during construction of a highway project. These measures are consistent with requirements set forth under the California State Water Resources Control Board (SWRCB) Order No. 99-08-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002 (General Construction Permit), which governs storm water and non-storm water discharges during construction activities, as well as with those requirements set forth in the Caltrans Permit Order No. 99 - 06 - DWQ (CAS 000003). These BMPs are directed at reducing storm runoff pollutants and eliminating non-storm water discharges. | | |
| Measure WQ-3: Storm Water Pollution Prevention Plan (SWPPP). Prior to start of soil-disturbing activity at the project site, a Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) will be prepared in accordance with and to partially fulfill the General Construction Permit. The SWPPP will be prepared per the SWPPP and Water Pollution Control Program (WPCP) Preparation Manual, (Storm Water Quality Handbooks, November 2000.) The SWPPP will meet the applicable provisions of Sections 301 and 402 of the CWA by requiring controls of pollutant discharges that utilize best available technology (BAT) which is economically achievable and best conventional pollutant control technology (BCT) to reduce pollutants. The SWPPP will be implemented concurrently with commencement of the soil-disturbing activity. The SWPPP will need to be certified in accordance with the signatory requirements of the General Construction Permit. | Contractor | Prior to start of soil-disturbing activities |
| Measure WQ-4: Spill Contingency. Emergency planning for highway spills will be addressed by both operational and structural BMPs. The TCA will take primary responsibility for spill clean-up and contingencies during construction and operation of the project, though coordination with other agencies will be necessary.<br><br>Operational BMPs include immediate emergency notification through 911 during a spill event. After emergency notification, the following notifications | TCA | During construction and operation of the project |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

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| will occur:<br><br>• The local fire department and the Orange County Fire Authority will then be notified, and emergency actions (road closures, medical evacuation, cleanup of hazardous materials, etc.) will be taken; if the spill occurs on or affects MCB Camp Pendleton, these authorities will be notified.<br><br>• If the spill is above the Reportable Quantity (RQ), the State Office of Emergency Services (800.852.7550) will be contacted and a control number provided. The National Response Center (800.424.8802) will be contacted to comply with Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requirements. The California Hazardous Material Incident Reporting System (CHMIRS) (916.427.4287) will be notified (assuming the spill volume is more than four liters (two gallons)) and appropriate forms filled out.<br><br>Structural BMPs consist of mechanisms within water quality BMPs to prevent large spills from reaching watercourses. These BMPs could consist primarily of operation valves at outlet works (e.g., from basins) that could be closed in an emergency. In this event, cleanup of hazardous materials and pollutants will be required within the basins to remove contaminated materials. | | |
| Measure WQ-5: Operations, Maintenance and Monitoring Plan. When an alternative is selected for implementation an Operations, Maintenance and Monitoring Plan will be developed in consultation with the appropriate agencies, i.e. Caltrans. Maintenance objectives for project BMPs will be addressed and formalized in the Operation, Maintenance and Monitoring Plan. Caltrans will monitor the BMPs to ensure maintenance objectives are being met. Details of the monitoring will comply with Caltrans Storm Water Policy and requirements of the 401 Certification with Caltrans as the holder of the statewide permit for state highways. | TCA and Caltrans | After an alternative is selected for implementation and ongoing during operation of the project |

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| Measure WQ-6: Monitoring of BMPs. The TCA will monitor Caltrans' maintenance of the BMPs for five years to assure compliance with maintenance criteria and schedules. The TCA will provide annual reports to the Regional Water Quality Control Boards documenting the maintenance of the BMPs. | TCA | For five years after project opening |
| **Mitigation Measures Related to Wetlands and Waters of the United States** | | |
| Measure WW-1. Prior to construction, the TCA shall designate a Project Biologist responsible for overseeing biological monitoring, regulatory compliance, and restoration activities associated with construction of the selected alternative in accordance with the adopted mitigation measures and applicable law. | TCA | Prior to construction |
| Measure WW-2. During final design of the project, the Project Biologist shall review the design plans and make recommendations for avoidance and minimization of sensitive biological resources. The TCA Environmental and Engineering Staff shall determine the implementation of those recommendations | Project Biologist, in consultation with TCA | During final design |
| Measure WW-3. A Biological Resources Management Plan (BRMP) shall be prepared prior to construction. The BRMP shall provide specific design and implementation features of the biological resources mitigation measures outlined in the resource agency approval documents. Issues during construction and operation to be addressed in the BRMP shall include, but are not limited to, resource avoidance, minimization, and restoration guidelines, performance standards, maintenance criteria, and monitoring requirements. The Draft BRMP shall be submitted to the USFWS, National Marine Fisheries Service (NMFS), CDFG, USACOE, RWQCB, FHWA, the California Coastal Commission and Caltrans for review to the extent required by permit by such agencies.<br><br>The primary goals of the BRMP are to ensure that (1) the long-term perpetuation of the existing diversity of habitats through restoration in the project area and adjacent urban interface zones and to minimize offsite or indirect effects; (2) the project is not likely to jeopardize the continued existence of any federally listed or state-listed endangered or threatened species; and (3) impacts to endangered and threatened species are minimized and mitigated to the maximum extent | Project Biologist, in consultation with TCA | Prior to construction |

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| practicable. The BRMP shall contain at a minimum the following:<br>a. Identification of all Environmental Sensitive Areas (ESA). ESAs are defined as sensitive habitats including, but not limited to, areas subject to the jurisdiction of the CDFG, USACOE, and USFWS.<br>b. Design of protective fencing (i.e., t-bar or yellow rope) around ESAs and the construction staging areas.<br>c. Locations of trees to be protected as wildlife habitat (roosting sites).<br>d. For areas that will be restored, the quality of the adjacent habitat will be characterized. This characterization shall include species composition, density, coverage, and presence of non-natives. This characterization will provide a baseline to compare the success of the restoration. The site preparation plan for each restoration site will include:<br>• Sources of plant materials and methods of propagation.<br>• Site preparation (clearing, grading, weed eradication, soil amendment, topsoil storage), irrigation, planting (container plantings, seeding), and maintenance (weed control, irrigation system checks, replanting) of restoration areas. Specification of parameters for maintenance and monitoring of restoration areas, including weed control measures, frequency of field checks, and monitoring reports for temporary disturbance areas within the right-of-way.<br>• Remedial measures to be taken if performance standards are not met.<br>• Methods and requirements for monitoring of the restoration efforts.<br>• Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within restoration areas.<br>e. Specific measures for the protection of sensitive habitats to be preserved in and adjacent to the right-of-way to ensure that construction does not increase beyond the impacts identified in the EIS/SEIR. These measures will include, | | |

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| but are not limited to, erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements. Details of the erosion, siltation, and dust control mitigation measures will be provided in the Storm Water Pollution Prevention Plan (SWPPP).<br>f. A summary of the type and quantification of habitats to be removed.<br>g. For areas that will be restored, the quality of the adjacent habitat will be characterized. This characterization shall include species composition, density, coverage, and presence of non-natives. This characterization will provide a baseline to compare the success of the restoration. The site preparation plan for each restoration site will include:<br>• Sources of plant materials and methods of propagation.<br>• Site preparation (clearing, grading, weed eradication, soil amendment, topsoil storage), irrigation, planting (container plantings, seeding), and maintenance (weed control, irrigation system checks, replanting) of restoration areas. Specification of parameters for maintenance and monitoring of restoration areas, including weed control measures, frequency of field checks, and monitoring reports for temporary disturbance areas within the project right-of-way.<br>• Remedial measures to be taken if performance standards are not met.<br>• Methods and requirements for monitoring of the restoration efforts.<br>• Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within restoration areas.<br>h. Specific construction monitoring programs for sensitive species including Coulter's saltbush, intermediate mariposa lily, southern tarplant, many-stemmed dudleya, western spadefoot toad, southwestern pond turtle, two- | | |

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| striped garter snake and San Diego cactus wren.<br>i. Specific measures for the protection of sensitive habitats to be preserved within and adjacent to the right-of-way to ensure that construction does not increase the impacts. These measures will include, but are not limited to, erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits and biological monitoring requirements. Details of the erosion, siltation and dust control mitigation measures will be outlined in the Storm Water Pollution Prevention Plan (SWPPP).<br>j. Provisions for biological monitoring during construction activities to ensure compliance and success of each avoidance and minimization measure. The monitoring procedures will (1) identify specific locations of wildlife habitat and sensitive species to be monitored; (2) identify the frequency of monitoring and monitoring methods (for each habitat and sensitive species to be monitored); (3) list required qualifications of biological monitor(s); and (4) identify reporting requirements.<br>k. Or equivalent measures, e.g., environmental permits. | | |
| Measure WW-4. In conjunction with the development of final plans and specifications for construction, or other activities involving vegetation/habitat removal, the Project Biologist shall review and approve the contractor's map of all sensitive habitats (Environmentally Sensitive Areas) within 152.4 meters (500 feet) of the grading limits on the grading plans. The ESA maps shall be prepared by the construction contractor's qualified biologist and approved by the TCA. All ESAs to be avoided and performance standards established by the resource agencies shall be clearly noted on the grading, construction, and landscape plans. Additionally, the landscape plans shall indicate that plant materials be local southern Orange County natives. | Project Biologist | During preparation of final construction plans and specifications |

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| Measure WW-5. During grading activities and construction operations, the Project Biologist shall conduct monitoring within and adjacent to sensitive habitats including monitoring of the installation of protective devices (silt fencing, sandbags, fencing, etc.), installation and/or removal of creek crossing fill, construction of access roads, vegetation removal, column installation, falsework installation and removal, and other associated construction activities, as deemed appropriate by the Project Biologist. Biological monitoring shall be conducted to document adherence to habitat avoidance and minimization measures addressed in the project mitigation measure and as listed in the USFWS, CDFG, and USACOE permits/agreements. | Project Biologist | During grading and construction activities |
| Measure WW-6. Final design and construction shall restore the perennial river and stream channels and ephemeral drainages and washes to their original contours upon completion of construction where feasible, with the exclusion of areas of permanent impact. | Project Biologist | Upon completion of construction |
| Measure WW-7. During all construction activities, the Contractor shall ensure that construction equipment or vehicles shall not be stored in areas defined as ESAs, including areas within the jurisdiction of the USACOE and/or CDFG. There shall be no fueling, lubrication, storage, or maintenance of construction equipment within 46 meters (150 feet) of CDFG or USACOE jurisdictional areas. Construction equipment staging/storage shall be located in previously disturbed or non-native areas to the maximum extent possible | Contractor, with oversight by Project Biologist | During construction activities |
| Measure WW-8. During all construction activities, the Contractor shall ensure that no waste material shall be discharged to any CDFG or USACOE jurisdictional areas. Spoil sites shall not be located within any CDFG or USACOE jurisdictional areas, or in areas where it could be washed into any surface water body. | Contractor, with oversight by Project Biologist | During construction activities |
| Measure WW-9. Prior to final design, the Contractor shall prepare the final construction Runoff Management Plan (RMP). The plan shall address the final location of facilities to route and detain corridor runoff for the purpose of maintaining peak flows and flow velocities downstream of the Alignment at existing rates and preventing project pollutants from reaching improved and | Contractor | Prior to final design |

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| unimproved downstream drainages. County of Orange Best Management Practices (BMPs) will be included in these runoff facilities of the Alternatives as determined appropriate by the Design Engineer. The final RMP will contain provisions for changes to the plan (e.g., alternative mechanisms plant materials) if necessary during project design and/or construction phases to achieve the stated goals and performance standards at an equal or greater level. The RMP will address issues of detention and settlement basin design for mitigation requirements in relation to water quality. The plan shall be submitted to the Regional Water Quality Control Board (RWQCB), Caltrans, and the Orange County Environmental Management Agency (OCEMA) Environmental Planning Division for review and comment. (RMP, Psomas 2003.) | | |
| Measure WW-10. The Contractor shall locate staging areas for construction equipment outside of areas in the jurisdiction of the USACOE or CDFG to minimize impacts to sandy creek benches. | Contractor, with oversight by Project Biologist | Prior to construction |
| Measure WW-11. Prior to final design, the TCA shall prepare a jurisdictional delineation documenting the Waters of the U.S. and wetlands, CDFG, and CCC jurisdictional impacts for the selected alternative.<br><br>Prior to final design, the TCA shall prepare a functional assessment of the wetland mitigation plan according to the tenets of the USACOE Regulatory Guidance Letter 02 2 to assure that the functions and values have been replaced and that no net loss of waters and wetland values occur. Habitat replacement guidelines shall be developed to identify and quantify habitats that will be removed along with the locations where habitats will be restored or relocated to ensure no net loss. | TCA | The jurisdictional delineation has been completed and is included in Final SEIR 4 |
| **Mitigation Measures Related to Wildlife, Fisheries, and Vegetation** | | |
| Measure WV-1. Mitigation Measure WV-1 is the same as mitigation measure WW-1 in Section 8.10. Please see Mitigation Measure WW-1. | See Mitigation Measure WW-1 in Section 8.10 | See Mitigation Measure WW-1 in Section 8.10 |

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| Measure WV-2. During final design of the project, the TCA Project Biologist shall review the design plans and make recommendations for avoidance and minimization of sensitive biological resources. TCA Environmental and Engineering Staff shall determine the implementation of those recommendations. | Project Biologist | During final design |
| Measure WV-3. A Biological Resources Management Plan (BRMP) shall be prepared prior to construction. The BRMP shall provide specific design and implementation features of the biological resources mitigation measures outlined in the resource agency approval documents. Issues to be discussed in the BRMP shall include, but are not limited to, resource avoidance, minimization, and restoration guidelines, performance standards, maintenance criteria, and monitoring requirements. The Draft BRMP shall be submitted to the USFWS, National Marine Fisheries Service (NMFS), CDFG, USACOE, RWQCB, FHWA and Caltrans for review to the extent required by permit by such agencies.<br><br>The primary goal of the BRMP will be to ensure the long-term perpetuation of the existing diversity of habitats in the project area and adjacent urban interface zones. The BRMP shall contain at a minimum the following:<br>a. Identification of all Environmental Sensitive Areas (ESA). ESA are defined as sensitive habitats including, but not limited to, areas subject to the jurisdiction of the CDFG, USACOE, and USFWS; areas supporting endangered, threatened or rare species; and areas supporting vegetation communities described as sensitive.<br>b. Design of protective fencing (i.e., t-bar or yellow rope) around ESAs and the construction staging areas.<br>c. Specific procedures during construction for the protection of sensitive plant, amphibian, reptile, bird, and mammal species, including perimeters around drip line oak trees.<br>d. Locations of trees to be protected as wildlife habitat (roosting sites).<br>e. Procedures for topsoil preservation and erosion control. | TCA | Prior to construction |

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| f. A summary of the type and quantification of habitats to be removed.<br>g. For areas that will be restored, the quality of the adjacent habitat will be characterized. This characterization shall include species composition, density, coverage, and presence of non-natives. This characterization will provide a baseline to compare the success of the restoration. The site preparation plan for each restoration site will include:<br>• Sources of plant materials and methods of propagation.<br>• Site preparation (clearing, grading, weed eradication, soil amendment, topsoil storage), irrigation, planting (container plantings, seeding), and maintenance (weed control, irrigation system checks, replanting) of restoration areas. Specification of parameters for maintenance and monitoring of restoration areas, including weed control measures, frequency of field checks, and monitoring reports for temporary disturbance areas within the project right-of-way.<br>• Remedial measures to be taken if performance standards are not met.<br>• Methods and requirements for monitoring of the restoration efforts.<br>• Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within restoration areas.<br>h. Specific construction monitoring programs for sensitive species including Coulter's saltbush, intermediate mariposa lily, southern tarplant, many-stemmed dudleya, western spadefoot toad, southwestern pond turtle, two-striped garter snake, and San Diego cactus wren.<br>i. Specific measures for the protection of sensitive habitats to be preserved within and adjacent to the right-of-way to ensure that construction does not increase the impacts. These measures will include, but are not limited to, erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and | | |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

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| biological monitoring requirements. Details of the erosion, siltation, and dust control mitigation measures will be outlined in the Storm Water Pollution Prevention Plan (SWPPP).<br><br>j. .Provisions for biological monitoring during construction activities to ensure compliance and success of each avoidance and minimization measure. The monitoring procedures will (1) identify specific locations of wildlife habitat and sensitive species to be monitored; (2) identify the frequency of monitoring and monitoring methods (for each habitat and sensitive species to be monitored); (3) list required qualifications of biological monitor(s); and (4) identify reporting requirements. | | |
| Measure WV-4. During grading activities and/or construction operations, the Project Biologist shall conduct monitoring within and adjacent to sensitive habitats including installation of protective devices (silt fencing, sandbags, fencing, etc.), installation and/or removal of creek crossing fill, construction of access roads, vegetation removal, column installation, false work installation and removal, and other associated construction activities, as deemed appropriate by the Project Biologist. | Project Biologist | During grading activities and/or construction operations |
| Measure WV-5. During grading activities and construction operations, the Project Biologist shall prepare a monthly biological monitoring letter report summarizing site visits, documenting adherence or violations of required habitat avoidance measures, and listing any necessary remedial measures. The report shall be submitted to the TCA and/or other implementing resource agencies. | Project Biologist | Monthly during grading activities and construction operations |
| Measure WV-6. Prior to the commencement of grading activities or other activities involving vegetation/habitat removal, the Project Biologist shall attend preconstruction meetings with construction foremen, bridge engineers, and the TCA to confirm that all environmental conditions are discussed. Monthly, or on an as needed basis, new construction personnel shall complete an educational program. Issues to be covered will include, but are not limited to, environmental measures for avoiding impacts to sensitive biological resources, ESAs, waste disposal, vehicle transportation routes, seasonal restrictions, | Project Biologist | Prior to the commencement of grading activities or other activities involving vegetation/habitat removal |

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| fueling/maintenance restrictions, and other relevant topics. | | |
| Measure WV-7. In conjunction with final design, the Project Biologist shall work closely with the Contractor to develop native plant palettes for revegetation areas adjacent to the roadway that abut natural open space and will be implemented by the Contractor. Final landscape design plans, which will be approved by the TCA, shall reflect the following and shall be incorporated into the BRMP:<br>• The landscaping along the corridor in open space (non-urban) areas shall be a mix of native, non-invasive, drought tolerant plant species from the scrub, grassland, and chaparral communities. All plants used shall comply with federal, state, and county laws requiring inspection of infestation. The vendor shall provide certification of inspection from the County of Orange and/or San Diego department of agriculture. The Project Biologist shall also inspect all plants before accepting delivery.<br>• The landscaping community type installed shall be consistent with the plant communities that occur in the vicinity of the intended landscape area.<br>• Seeds, cuttings, and potted plants shall be collected from local plant material as appropriate, supplemented by material from native plant nurseries. The seed vendor shall furnish certification that the seed has been tested for purity by a certified seed laboratory and does not contain seed of any non-native, invasive species.<br>• Native California plant species found in the project area shall be used. Invasive, noxious weed, or non-native species identified on the State of California List of Noxious Weed Species or the California Exotic Pest Plant Council Exotic Pest Plants (CalEPPC) of Greatest Ecological Concern in California List shall not be used in landscaping along open space areas.<br>• All mulches used shall be free of invasive species seed.<br>• Landscape areas shall be subject to maintenance during plant establishment | Project Biologist, in conjunction with Contractor and with oversight by TCA | During final design |

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| (i.e., non-native species removal) that will be directed by the Project Biologist. However, the landscape areas shall not be subject to performance standards and will not be subject to mitigation in the future if construction occurs.<br>• Temporary low-volume irrigation systems, using reclaimed water (where available), shall be included in the final design of the selected alternative.<br><br>Portions of the landscaped areas within the Caltrans maintenance area and adjacent to the roadway may be subject to fuel modification requirements, which may preclude the use of many project-indigenous species. In these instances, plant palettes may contain both the California native plant cultivars which will be purchased and indigenous plant species found in the project area. This is due to the limited number of indigenous plant species included within the Orange County Fire Authority Fuel Modification Plant List. | | |
| Measure WV-8. Mitigation Measure WV-8 is the same as Mitigation Measure WW-4 in Section 8.10. See mitigation measure WW-4. | See Mitigation Measure WW-4 in Section 8.10 | See Mitigation Measure WW-4 in Section 8.10 |
| Measure WV-9. Caltrans procedures shall be followed for the protection of ESAs. These procedures are: (1) no construction access, parking, or storage of equipment or materials will be permitted within marked ESAs or other jurisdictional areas; (2) to the maximum extent practicable, construction access points shall be limited in proximity to protected habitat; (3) waste, dirt, and trash shall not be deposited on protected habitat; (4) vehicle transportation routes shall be confined to the narrowest practicable area in areas adjacent to marked, protected habitats during construction/operations activities, (5) no construction personnel shall be permitted access to these areas except for the purpose of invasive species removal without the Project Biologist's approval, and (6) disposal of trash adjacent to ESAs shall be removed/emptied on a daily basis. | Contractors | During construction |
| Measure WV-10. Prior to the commencement of grading activities or other activities involving vegetation/habitat removal, the Project Biologist shall field | Project Biologist | Prior to commencement of grading or other activities involving |

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| verify that protective fencing (t bar/yellow rope and silt fencing when construction is upslope from sensitive habitat) has been installed along the disturbance limits. Additionally, the Project Biologist shall verify that all other Caltrans procedures for ESAs, identified and mapped on grading plans, have been installed by the construction contractor. These protective fencings shall be field verified by the Project Biologist on a regular basis. | | vegetation/habitat removal and regularly during grading and construction |
| Measure WV-11. To mitigate impacts, the TCA has identified additional habitat preservation and restoration activities in the Upper Chiquita Canyon Conservation Area. The Upper Chiquita Canyon Conservation Area consists of approximately 478.7 hectares (1,182 acres) created by the TCA to mitigate biological impacts resulting from construction of the FTC N. Of these 478.7 hectares (1,182 acres), 327 credits have been set aside as a mitigation bank for future project impacts. The Conservation Area was originally under substantial threat for development and the resources within the Area have been conserved, but otherwise would have been lost or substantially degraded. In addition, the Upper Chiquita Canyon Conservation Area provides opportunities for preservation activities consisting of additional habitat for oak woodland and sensitive plant species. There are also opportunities for restoration activities on site that would include additional acres of oak woodland, non-wetland drainages, coastal sage scrub, coastal sage scrub/native perennial grassland ecotone, and native perennial grassland habitats. These opportunities for preservation and restoration activities would also serve to mitigate impacts on sensitive plants for the SOCTIIP Alternatives.<br>a. Impacts to scrub communities (and all sub-types thereof except floodplain sage scrub) shall be mitigated through the use of scrub mitigation credits in the Upper Chiquita Canyon Conservation Easement area and additional preservation (if necessary). The Upper Chiquita Canyon Conservation Easement area currently contains 327 mitigation credits approved by the USFWS and CDFG. The scrub areas impacted by the selected alternative will be mitigated at a credit to hectare ratio of 1:0.40 (one Upper Chiquita Canyon Conservation Easement mitigation credit for every 0.40 ha impact or | TCA | Prior to commencement of grading |

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| one Upper Chiquita Canyon Conservation Easement mitigation credit for every 1.0 ac lost).<br>b. Any additional scrub areas restored within the Upper Chiquita Canyon Conservation Easement area may be added to the credit total, with the approval of the USFWS, and applied to the mitigation ratio accordingly. The TCA and the USFWS shall determine the criteria for the establishment of the new credits for the restored areas pursuant to the Upper Chiquita Canyon Conservation Bank Agreement which was entered into with the USFWS and the CDFG.<br>c. Any scrub areas that are impacted by the selected alignment and that have not been mitigated by the use of the Upper Chiquita Canyon Conservation Easement mitigation credits (i.e., impact area exceeds mitigation credits available) shall be mitigated through preservation at a ratio of 1:1 (0.4 ha [one ac] for every 0.4 ha [one ac] lost), or other mitigation requirement that is necessary to meet the regulatory standards of an applicable state or federal regulatory program. | | |

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| Measure WV-12. (Duplicate of Measure TE-26). Impacts to native grasslands shall be mitigated at a 1:1 ratio through either preservation or restoration in designated open space (e.g., Upper Chiquita Canyon Conservation Easement). Should restoration be proposed, the restoration areas shall be located in areas deemed appropriate by the project biologist for native grassland restoration. Restoration areas shall occur within dedicated open space areas including, but not limited to, the Upper Chiquita Canyon Conservation Easement area. The restoration program for native grassland areas shall be included in the BRMP and shall include the following measures.<br>• Site analysis for appropriate soils.<br>• Site preparation specifications based on site analysis, including but not limited to grading, and weeding.<br>• Specifications for plant and seed material appropriate to the locality of the mitigation site and the timing of restoration activities.<br>• Specifications for site maintenance to establish the habitats, including but not limited to weeding and temporary irrigation.<br>• Restoration areas shall be considered successful at five years if the following standards are achieved:<br>• The site does not require substantial maintenance for at least two consecutive years during the monitoring period.<br>• The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.<br>• Soil at the site exhibits a level of beneficial arbuscular mycorrhizal fungi that is comparable to an appropriate reference site, as demonstrated through soil infestivity potential.<br>• Absolute percent cover of native species is comparable to the absolute cover of native species at an appropriate reference site within an 80 percent | TCA and Project Biologist | Prior to commencement of grading and ongoing for five years after establishment of restoration areas |

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| confidence limit.<br>• An index of species diversity of the restored and/or created habitat areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.<br><br>Monitoring shall be conducted for five years (or less if site meets success criteria as designated above earlier) to ensure successful establishment of native grassland vegetation within the restored areas. If success standards are not met, remedial measures, hydroseeding, or introduction of container stock shall be implemented as directed by the Project Biologist. | | |
| Measure WV-13.<br>a. TCA will mitigate impacts to coast live oak and elderberry woodland communities by replacing, creating, restoring, or preserving (1) 0.4047 ha (one ac) of the identified resource for every 0.4047 ha (one ac) of the applicable resource impacted by the project, or (2) such other mitigation requirement that is necessary to meet the regulatory standards of an applicable state or federal regulatory program. Preservation and restoration areas shall occur within dedicated open space areas including, but not limited to, the Upper Chiquita Canyon Conservation Easement area as determined by the Project Biologist.<br>b. The restoration program shall be detailed with the BRMP. Prior to restoration of these communities, hydrological testing and monitoring of the creation site shall be conducted to determine that sufficient hydrology exists to support the community. If necessary, a temporary irrigation program shall be incorporated into the mitigation design to ensure successful establishment of the community. The RMP will address issues of detention and settlement basin design for mitigation requirements in relation to water quality.<br><br>The following performance standards shall apply for the restoration of elderberry woodland areas. Restoration shall be considered successful if: | TCA and Project Biologist | Prior to commencement of grading and ongoing for five years after establishment of restoration areas |

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| • The site does not require substantial maintenance for at least two consecutive years during the monitoring period.<br>• The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.<br>• Absolute percent cover of native upper and mid canopy species is 70 percent.<br>• An index of species diversity of the restored areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.<br><br>For coast live oak woodland, the following standards shall apply:<br>• The site does not require substantial maintenance and meets the success criteria established for this community for at least two consecutive years during the monitoring period.<br>• The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.<br>• Absolute percent cover of native upper and mid canopy species is 50 percent, with five percent cover from oak trees.<br>• An index of species diversity of the restored areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.<br><br>c. Monitoring shall be conducted for five years (or less if success criteria are met earlier) to ensure successful establishment of the restored areas. If success standards are not met, remedial measures including introduction of additional seed and/or container stock and adjusting of irrigation shall be implemented as directed by the Project Biologist. | | |
| Measure WV-14. In conjunction with construction activity, the Contractor shall | Contractor | During grading and construction |

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| control dust accumulation on natural vegetation at the source of disturbance by standard dust control measures (Mestre Greve Associates 2003). | | |
| Measure WV-15. Prior to final design of the selected alternative, the Project Biologist shall ensure that the location of the proposed wildlife bridges and culvert identified in the NES will provide adequate travel capabilities, contain adequate vegetation cover, have adequate daylight, and have appropriate fencing to encourage animals to use these underpasses. Upon selection of and refinement to, the selected alternative, smaller culverts and bridges that will be necessary to provide drainage and/or avoid impacts to jurisdictional areas shall also be designed, at the direction of the Project Biologist, to promote local and regional wildlife movement. | Project Biologist | Prior to final design |
| Measure WV-16. Prior to, or in conjunction with, the permit of application and/or process, Caltrans (Environmental and Maintenance) and resource agencies are to be given an opportunity for review and approval of the design of wildlife movement bridges, undercrossings, and culverts.<br><br>The width and the height of the wildlife bridges specified in this mitigation measure are those provided by Caltrans as minimum standards. This approach is appropriate and such detail can be provided during further discussions and only for the selected project. To demonstrate the success of this approach, the TCA has monitored seven wildlife undercrossings during the fall and spring of each year since 1999. The wildlife undercrossings are along the Foothill and Eastern Transportation Corridors and consist of bridges as well as large diameter culverts. Methods used to document the presence and diversity of wildlife using the undercrossings include scent stations, spotlight surveys, general scat surveys, and direct observations. The data have shown that there is a considerable amount of wildlife within the study area using the undercrossings. The wildlife observed using the undercrossings includes mountain lions, bobcats, coyotes, gray foxes, and mule deer. This usage demonstrates the overall success of the undercrossings in allowing wildlife continued movement throughout the region. In summary, preliminary results indicate that wildlife is continuing to use the | TCA and Project Biologist | Prior to, or at the time of, resource agency permit application and/or process |

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| undercrossings along the Toll Roads.<br><br>a. Wildlife bridges and culverts shall be designed to provide approaching animals a clear view of the habitat or horizon on the opposite site of the structure. The minimum width at the base of the wildlife bridge or culvert shall be six m (20 ft). The minimum vertical clearance shall be 5.2 m (17 ft) from the floor of the bridge/culvert to the bottom of the structure. No artificial lighting shall be installed or used in or around the bridge/culvert, unless otherwise required to meet Caltrans approval. The ground surface of the wildlife bridges and culverts shall be constructed with a slope ratio of 1:1.5 (V:H).<br>b. Dirt or natural vegetation substrates, rather than concrete or other human-made material, will be placed along the bottom of the bridges or culverts as reasonably feasible.<br>c. Vegetation naturally occurring on the side slopes to the entrances to the underpass will not be removed, to the extent feasible. Where natural vegetation at underpass entrances does not occur, is minimal, or has been removed as a result of bridge or culvert construction, vegetation shall be planted along the slopes that match the closest intact native vegetation. Low-lying shrubs and/or small trees native to the area will be planted to encourage wildlife use of the underpass.<br>d. The appropriate vegetation-type and quantity will be determined by the Project Biologist during construction of the underpass and will consist, at a minimum, of appropriate large shrubs and trees that will achieve at least 1.5 m (five ft) in height at maturity. The replanting will occur during the final stages of underpass construction or immediately following construction in the appropriate season for planting. The planting of vegetation at bridges over drainages shall be compatible with flood control requirements.<br>e. Materials such as rip-rap will not be used in or around the underpass entrances unless required by hydrology/hydraulic conditions. | | |
| Measure WV-17. Prior to operation of the corridor, chain-link, wire mesh with | TCA and Caltrans | During construction and ongoing for |

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| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
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| metal poles, or similar fencing of at least 2.1 m (seven ft) in height will be erected on both sides of the selected alternative from the underpass entrance to a distance of at least 1.0 km (0.62 mile) along the corridor to "funnel" wildlife to the underpass area and to minimize wildlife attempts to cross the roadway surface. Fence height up to three m (10 ft) in height will be used in areas deemed appropriate by the project biologist, TCA, USFWS, FHWA and Caltrans.<br><br>Wildlife fencing adjacent (100 m/328 ft) to wildlife movement underpasses will be inspected semiannually to identify and repair any gaps or tears in the fence caused by erosion, storm events, vandalism, burrowing animals, or other means that could allow wildlife access onto the roadway surface. TCA will be responsible for the wildlife fencing for the first three years of completing the corridor, with Caltrans assuming responsibility thereafter. | | three years after project opening |
| Measure WV-18. Prior to operation of the corridor, road signs indicating the potential for deer and mountain lion movement shall be installed where indicated by the Project Biologist, due to the potential for wildlife to circumvent the wildlife fencing. | Project Biologist and Contractor | Prior to operation of the corridor |
| Measure WV-19. All bridges and culverts in the final design plan will be monitored for a period of three years to document the effectiveness of use. Target species to be evaluated shall be determined by the Regulatory permits, including: USFWS, ACOE and CDFG, specific to each bridge and culvert. Wildlife movement studies will be conducted at each underpass twice each year for at least eight weeks during the periods between March and May and between September and November. The studies will begin during the first full time period (beginning with March or September) occurring after the opening of the corridor. Reports will be prepared and submitted to the TCA annually. Based on results of surveys, recommendations to enhance wildlife use of underpasses shall be provided as appropriate (i.e., fencing modification, vegetation enhancement, or clearing, etc.). | Project Biologist | For three years after project opening |
| Measure WV-20. In conjunction with final design, the TCA shall incorporate | TCA, subject to | At time of final design |

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| low-light design features, where feasible, adjacent to the following sensitive wildlife habitats: bridges or culverts within wildlife corridors, and scrub, riparian, and woodland communities. One or more of the following design options shall be used, if feasible, recognizing the constraints of roadway lighting requirements: (1) low-intensity street lamps, (2) low-elevation light poles, or (3) shielding by internal silvering of the globes or external opaque reflectors. Design features shall meet Caltrans approval. | Caltrans approval | |
| Measure WV-21. During final design, the TCA, in coordination with the RMP, shall design, construct, and/or maintain any structure/culvert placed within a stream where sensitive fish species do/may occur such that it does not constitute a barrier to upstream or downstream movement of aquatic life, or cause an avoidance reaction by fish that impedes their upstream or downstream movement. This includes, but is not limited to, the supply of water at an appropriate depth for fish migration. | TCA | During final design |
| Measure WV-22. Prior to construction of the selected alternative, focused sensitive plant species surveys shall be conducted to determine the distribution of sensitive plants within the impact area of the selected alternative so appropriate avoidance (for all sensitive plant species), and seed collection and salvage measures (for Coulter's saltbush, intermediate mariposa lily, southern tarplant, and many-stemmed dudleya) can be implemented. This measure will ensure that the biologist obtains the current onsite conditions, just prior to construction, to maximize avoidance. Surveys shall be conducted during the appropriate time of year (i.e., during the flowering period for each species). Locations of sensitive plant species shall be mapped and shown on construction drawings and identified as ESAs. During final design, temporary access roads will be sited with the approval of the Project Biologist so as to avoid or minimize impacts to sensitive plant populations. | Project Biologist and Contractor | During final design and prior to construction |

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| Measure WV-23. Measure WV-23.<br>a. During the spring prior to grubbing or grading (or as determined by the Project Biologist), the limits of individual populations of Coulter's saltbush to be impacted shall be flagged and individual plants shall be marked with pin flags to facilitate the locating of individual plants after flowering. Prior to construction, seeds shall be collected from Coulter's saltbush plants from approximately June through October from ripened seed heads, for later propagation, by personnel experienced in collection of native seed and native plant propagation. This seed shall be stored by a certified seed bank. An appropriate site within the upper Chiquita Canyon Conservation Area or other area shall be identified for the seeding of this species by the Project Biologist. The site shall have similar soils, slope, aspect, and microhabitat characteristics as the site with occupied Coulter's saltbush to support this species.<br>b. Prior to construction, 75 percent of the Coulter's saltbush plants within the area to be impacted shall be translocated to an appropriate site within the Upper Chiquita Canyon Conservation Area or within an appropriate open space dedication area within the region. Prior to the salvage operation, the number of Coulter's saltbush plants to be relocated shall be determined by the Project Biologist. The site can be the same or a different site than is used for the distribution of seed, but shall have similar soils, slope, aspect, and microhabitat characteristics as the site with occupied Coulter's saltbush. A bulldozer or loader shall be used to remove the top 30 cm (one ft) of soil, including all plant material which shall be loaded on flatbed trucks and transported to the receiver site. The Project Biologist shall coordinate all salvaging and relocation effort so that these operations occur in the appropriate season for maximum success.<br>c. Re-establishment of Coulter's saltbush will be monitored for five years. The survival of relocated plants will be recorded each year. Relocation will be considered successful when the survivorship of the relocated plants has stabilized with a 50 percent survival rate, and establishment of seedlings | | |

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| from the seeded material is documented. | | |
| Measure WV-24.<br>a. Intermediate mariposa lily seed shall be collected from populations to be impacted. Prior to grubbing or grading (or as otherwise determined by the Project Biologist), the limits of individual populations to be impacted shall be flagged and individual plants shall be marked with pin flags to facilitate locating individual plants after flowering. Seed shall be collected in late July or early August from ripened seed heads, for later propagation or hand seeding, by personnel experienced in the collection of native seed and native plant propagation.<br>b. Seed collection shall be conducted during two successive years and the following three-year program shall be implemented to ensure the likelihood of success. Propagated mariposa lilies typically exhibit a germination rate of 80 percent; this percentage shall be used to determine the number of seeds to be collected to ensure production of the same number of plants as shall be impacted by construction. The propagated plants shall be grown for two years to allow the bulbs to reach optimal size prior to transplantation. The remaining seed not used for propagation from the first year of seed collection shall be divided in half with one-half hand broadcast during the first year and the remaining one-half hand broadcast the following year.<br>c. The propagated plants shall be introduced (over the three-year program), using at least a 2:1 ratio, into appropriate habitat in open space dedication areas, or as directed by the Project Biologist. Seeding shall occur in similar areas. Site selection shall be based on the presence of suitable habitat as determined by the Project Biologist. Bulbs from the propagated plants shall be planted at the end of the second growing season. The same program shall be followed for seed collected during the second year. Planting of bulbs and hand broadcasting of seed shall be performed in September or October.<br>d. Re-establishment of intermediate mariposa lily will be monitored for three years following initial planting of the propagated plants and seeding. The survival of the plants will be recorded each year. Establishment of the | Project Biologist and Contractor | a. Flagging prior to grubbing or grading; seed collection in late July/early August<br>b. During two successive years and the following three-year program<br>c. During the three-year program |

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| population will be considered successful when the survivorship of the relocated plants has stabilized with a minimum 10 percent flowering in any one year of the monitoring period and establishment of seedlings from the seeded material is documented. | | |
| Measure WV-25.<br>a. Areas determined to have appropriate hydrology and soil chemistry (salinity) shall be reseeded with seed collected from populations of southern tarplant. Southern tarplant is restricted to saline, vernally mesic areas, often along the margins of estuaries or areas of high salinity. The Project Biologist shall identify candidate areas within open space areas that exhibit suitable conditions for introduction of the tarplant.<br>b. For one year prior to construction as feasible, the TCA shall have southern tarplant seed collected by personnel experienced in collection of native seeds. Seed collection shall be conducted during successive years from September through December. One-half of the first years' collected seed shall be hand broadcast at the reintroduction site with the remaining one-half stored in appropriate conditions for introduction the following year. Seed collected during the second season shall be stored for potential later use in the event that success standards are not met following the seeding during years one and two.<br>c. Because southern tarplant is an annual species, population numbers are expected to naturally fluctuate from year to year depending upon environmental conditions. Reseeded areas shall be monitored for three years following the initial seeding. Establishment shall be considered successful if plant densities during any of the three years of monitoring are comparable to densities of the impacted populations based on sampling quadrants. If established populations do not achieve comparable densities of impacted populations, additional reintroduction sites shall be identified and stored seed, obtained during the collection period, shall be introduced into additional sites over a two-year period (as in the initial reintroduction program described above). The additional sites shall be monitored for three | a. Project Biologist<br>b. TCA and Project Biologist<br>c. Project Biologist | a. Prior to construction<br>b. For one year prior to construction<br>c. For three years following initial seeding and additionally, if needed, as specified by the Project Biologist |

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| years and shall be considered successful if population numbers at all of the sites achieve densities of impact areas. If established populations have not reached the density threshold following the addition of supplemental sites, further remedial measures shall be implemented as determined appropriate by the Project Biologist. | | |
| Measure WV-26.<br>a. Many-stemmed dudleya caudexes and seed shall be collected from populations to be impacted. Prior to grubbing or grading (or as otherwise determined by the Project Biologist), the limits of individual populations to be impacted shall be flagged and groups of plants shall be marked with pin flags to facilitate the locating of individual plants after flowering. Seed shall be collected in late July or early August from ripened seed heads, for later propagation or hand seeding, by personnel experienced in the collection of native seed and native plant propagation. Twenty-five percent of the seeds collected will be stored with Rancho Santa Ana Botanical Gardens (RSABG) by their standard agreement. The remainder of the seed will be used to establish the dudleya population as described below.<br>b. Caudexes shall be harvested for later planting, using appropriate screens or mesh and shall be conducted by individuals experienced in the salvage of many-stemmed dudleya. Where possible, caudexes will be salvaged by removing soil blocks containing marked dudleya. Both seed and collected caudexes shall be replanted and established at an appropriate site within an open space dedication area at the direction of the Project Biologist.<br>c. Monitoring of the established populations shall be conducted for three years. The propagated caudexes shall be introduced (over the three-year program), using at least a 1:1 ratio. Establishment shall be considered successful if planted/seeded populations total 75 percent of the impacted populations and the population demonstrates recruitment of seedlings. If planted/seeded populations do not achieve 75 percent of the impacted populations, additional collection of seed shall be performed and additional caudexes will be propagated. If planted/seeded populations do not achieve 75 percent | Project Biologist | Prior to grubbing or grading, seed collection in late July or early August, and monitoring ongoing for three years<br><br>a. Flagging prior to grubbing or grading; seed collection in late July/early August<br>b. Before grubbing and grading<br>c. For three years after plants are established. |

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| thresholds, further remedial measures shall be implemented as recommended by the Project Biologist. | | |
| Measure WV-27. Before entering or leaving the construction site, all construction equipment shall be inspected for evidence of invasive species and/or their seeds. Should any plants and/or seeds be detected, the equipment will be washed to ensure no invasive species and/or their seeds will be brought into or removed from the site. | Contractor with assistance from Project Biologist | During construction |
| Measure WV-28. Prior to construction, substantial populations of invasive plant species identified on the State of California List of Noxious Weed Species and the California Exotic Pest Plant Council Exotic Pest Plants (CalEPPC) of Greatest Ecological Concern in California List adjacent to the grading limits shall be mapped. | Contractor with assistance from Project Biologist | Prior to construction |
| Measure WV-29. The Project Biologist shall prepare an invasive species management program to be incorporated into the BRMP. The program shall discuss the invasive species within landscaping and mitigation areas to be eradicated or controlled and eradication methods, which may include mowing, hand removal, or herbicide application. Removal of invasive plant species on the State of California List of Noxious Weed Species with Pest Rating A shall be required, at the direction of the Project Biologist. Eradication, containment, or control of all invasive plant species on the State of California List of Noxious Weed Species with Pest Rating B shall be at the discretion of the Project Biologist. The program shall also address invasive species identified in the California Exotic Pest Plant Council Exotic Pest Plants of Greatest Ecological Concern in California List and methods for their control. The potential for contribution of funds to such programs as the Arundo Removal Program to assist with removal of giant reed or other species from riparian habitats such as San Juan Creek shall also be addressed. The program shall also discuss monitoring of the landscaped and mitigation areas to ensure invasive species are properly controlled or eradicated. The maintenance of the mitigation sites along the corridor will be under the supervision of the Project Biologist (Executive Order 13112, Feb. 3, 1999). | Project Biologist | Prior to construction |

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| Measure WV-30. Before and during construction (as appropriate), the Project Biologist shall conduct focused nocturnal and diurnal surveys within suitable habitat between February and May (a minimum of one week prior to the onset of construction) to determine the presence or absence of the western spadefoot toad in the impact area. Any western spadefoot toads found within the impact area will be relocated outside the construction area by the Project Biologist. In areas where western spadefoot toads were found, fencing or screening approximately 1.5 m (five ft) in height (with one m (three ft) buried below the surface) will be installed to prevent western spadefoot toads from entering the area after the onset of construction. | Project Biologist and Contractor | Between February and May, and a minimum of one week prior to the onset of construction |
| Measure WV-32. During grading activities, two-striped garter snakes observed within and adjacent to the impact area will be relocated outside of the construction area either upstream or downstream of the selected alternative by the Project Biologist. | Project Biologist | During grading activities |
| Measure WV-33. To minimize and offset adverse effects of the selected alternative on the San Diego cactus wren, suitable habitat for this species (as determined by the Project Biologist) shall be grubbed from the project footprint area from September to February if feasible (generally outside the breeding season for this species). The Project Biologist shall survey the suitable habitat within the areas to be grubbed one day prior to any vegetation disturbance to determine the location and numbers of San Diego cactus wrens. The Project Biologist will be on-site and present during all suitable habitat clearing and removal activities to minimize the potential for individual San Diego cactus wrens to be wounded or killed during the clearing of habitat. | Project Biologist and Contractor | Between September and February in San Diego cactus wren habitat |
| Measure WV-34. If grubbing activities between February and August (generally within the breeding season for San Diego cactus wren) are unavoidable, the following measures will be implemented:<br>a. Surveys by the Project Biologist will be conducted a minimum of three times on separate days after the initiation of the nesting season to determine the presence of San Diego cactus wrens, nest building activities, egg incubation activities, or brood rearing activities. These surveys will be conducted within | Project Biologist and Contractor | During grading activities that occur between February and August |

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| the week prior to the initiation of brushing, grading, or other construction activities. One survey will be conducted the day immediately prior to the initiation of work. The USFWS will be notified in writing seven days prior to the initiation of surveys.<br>b. If no nest(s), nesting behavior, or brood rearing activities are detected, work may commence. Prior to and during work activities, the Project Biologist will locate any individual San Diego cactus wrens on-site and direct operators to begin in an area away from the birds. The pattern of brushing/grubbing activities will be designed to optimize opportunities for flushed birds to be directed towards the open space areas in the vicinity of the impact area.<br>c. During construction, no activity will occur within approximately 150 m (500 ft) of active nests. | | |
| Measure WV-35.<br>a. Prior to construction activity, the Project Biologist shall survey the construction limits for the presence of occupied raptor nests and nest burrows (for burrowing owls). Occupied raptor nests/burrows shall be mapped on the construction plans by the Project Biologist. The Project Biologist will visit the nest/burrow site at the beginning of the nesting season to verify the use of the nests/burrows for that particular year.<br>b. If nesting activity begins at any nest site, then the active nest/burrow(s) will be protected as an ESA until nesting activity has ended to ensure compliance with Section 3503.5 of the CDFG Code. To protect any active nest/burrow sites, the following restrictions on construction are required between February and June (or until nests are no longer active as determined by the Project Biologist): (1) clearing limits will be established a minimum of approximately 150 m (500 ft) in any direction from raptor nests/burrows (or as otherwise determined by the Project Biologist); and (2) access and surveying will not be allowed within approximately 300 m (900 ft) of nests/burrows (or as otherwise determined by the Project Biologist). | Project Biologist | Prior to construction, with restrictions on construction between February and June |

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| Measure WV-36. Prior to construction activity, the Project Biologist shall survey the construction limits for the presence of occupied breeding coyote, bobcat, or mountain lion dens. In the event that an occupied breeding coyote, bobcat, or mountain lion den is located within the impact area, then grading and construction operations shall be redirected temporarily around the den for a distance of approximately 150 m (500 ft) or as otherwise determined by the Project Biologist. The dens shall be resurveyed by the Project Biologist within the last month of the breeding seasons of these species to verify completion of the breeding cycle. Dens shall be removed during the non-breeding season only. | Project Biologist | Prior to construction and as specified regarding breeding seasons |
| Measure WV-37. During the spring and summer (May through August) prior to the habitat removal, a qualified bat biologist shall survey all potential roosting habitat proposed for removal by the proposed construction. If a roost is found, the animals will be evicted and the resource sealed or removed so the bats cannot return and would be forced to find alternative roost sites. Tree removal shall be conducted between September and November to avoid hibernating bats (December through February) and maternity season (May through August) if feasible. | Project Biologist | Survey during spring and summer, and tree removal between September and November |
| Measure WV-38. Impacts to floodplain sage scrub, riparian herb, and other sub-types within the Vernal Pools, Seeps, and Wet Meadows and Marsh plant communities shall be mitigated at a 1:1 ratio or other ratio that compensates for functions and values. Mitigation shall consist of creating the above mentioned community types in the approximate proportions in which they currently exist within the impact area or as otherwise required by the resource agencies. Creation areas shall occur within dedicated open space areas including, but not limited to, the Upper Chiquita Canyon Conservation Easement area. The creation program for the above areas shall be included in the BRMP and shall include the following measures.<br>• Site analysis for appropriate soils and hydrology.<br>• Site preparation specifications based on site analysis, including but not limited to grading, and weeding. | Project Biologist | Prior to construction, for a minimum of five years and/or until success standards are met |

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| • Soil and plant material salvage from impact areas, as appropriate to the timing of impact and restoration as well as the location of restoration sites.<br>• Specifications for plant and seed material appropriate to the locality of the mitigation site.<br>• Specifications for site maintenance to establish the habitats, including but not limited to weeding and temporary irrigation.<br><br>Creation areas shall be considered successful if the following standards are achieved:<br>• The site does not require substantial maintenance for at least two consecutive years during the monitoring period.<br>• The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.<br>• Absolute percent cover of native species is comparable to the absolute cover of native species at an appropriate reference site within an 80 percent confidence limit.<br>• An index of species diversity of the restored and/or created habitat areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.<br><br>Monitoring shall be conducted for five years (or less if success criteria are met as designated above earlier) to ensure successful establishment of hydrophytic vegetation within the restored/created areas by wetland species. If success standards are not met, remedial measures, seeding, or introduction of container stock shall be implemented as directed by the Project Biologist. | | |
| Measure WV-39. TCA will mitigate impacts to riparian scrub, woodland, and forest communities by replacing, creating, restoring, or preserving (1) 0.40 ha (one ac) of the identified resource for every 0.40 ha (one ac) of the applicable | TCA and Project Biologist | For a minimum of five years and until success standards are met |

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| resource impacted by the project or other ratio that compensates for functions and values, or (2) such other mitigation requirement that is necessary to meet the regulatory standards of an applicable state or federal regulatory program. Mitigation areas shall occur within dedicated open space areas including, but not limited to, the Upper Chiquita Canyon Conservation Easement area as determined by the Project Biologist. The restoration program shall be detailed with the BRMP.<br><br>Prior to restoration of these communities, hydrological testing and monitoring of the creation site shall be conducted to determine that sufficient hydrology exists to support the community. If necessary, a temporary irrigation program shall be incorporated into the mitigation design to ensure successful establishment of the community.<br><br>The following performance standards shall apply for the restoration of these areas (except for southern coast live oak riparian forest). Restoration shall be considered successful if:<br>• The site does not require substantial maintenance for at least two consecutive years during the monitoring period.<br>• The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.<br>• Absolute percent cover of native upper and mid canopy species is 70 percent in forest scrub communities and five percent in woodland communities.<br>• An index of species diversity of the restored areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.<br><br>For southern coast live oak riparian forest, the following standards shall apply: | | |

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| • The site does not require substantial maintenance and meets the success criteria established for this community for at least two consecutive years during the monitoring period.<br>• The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.<br>• Absolute percent cover of native upper and mid canopy species is 50 percent, with five percent cover from oak trees.<br>• An index of species diversity of the restored areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.<br><br>Monitoring shall be conducted for a minimum of five years to ensure successful establishment of the restored areas. If success standards are not met, remedial measures including introduction of additional container stock and adjusting of irrigation shall be implemented as directed by the Project Biologist. | | |
| Measure WV-40. Impacts to open water shall be mitigated at a 1:1 ratio by the creation of wetlands and impounded features to be incorporated into the herbaceous riparian habitat. The open water mitigation areas shall be located at a site determined by the Project Biologist to have hydrology sufficient to support the desired open water feature. Appropriate hydrological and soils testing shall be performed to ensure that the created open water area function properly. Creation of open water areas shall be maintained as part of the herbaceous riparian habitat restoration. | Project Biologist | At the time of habitat restoration and ongoing |
| **Mitigation Measures Related to Threatened and Endangered Species** | | |
| Measure TE-1. Prior to construction, the TCA shall designate a Project Biologist responsible for overseeing biological monitoring, regulatory compliance, and restoration activities associated with construction of the selected alternative in accordance with the adopted mitigation measures and applicable law. | TCA | Prior to construction |

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| Measure TE-2. Mitigation Measure TE-2 is the same as Mitigation Measure WV-2 in Section 8.11. See Mitigation Measure WV-2. | See Mitigation Measure WV-2 in Section 8.11 | See Mitigation Measure WV-2 in Section 8.11 |
| Measure TE-3. A Biological Resources Management Plan (BRMP) shall be prepared prior to construction. The BRMP shall provide specific design and implementation features of the biological resources mitigation measures outlined in the resource agency approval documents. Issues to be discussed in the BRMP shall include, but are not limited to, resource avoidance, minimization, and restoration guidelines, performance standards, maintenance criteria, and monitoring requirements. The Draft BRMP shall be submitted to the USFWS, NMFS, CDFG, USACOE, RWQCB, FHWA and Caltrans for review and approval.<br><br>The primary goals of the BRMP are to ensure that (1) the long-term perpetuation of the existing diversity of habitats in the project area and adjacent urban interface zones and minimize offsite or indirect effects; (2) the project is not likely to jeopardize the continued existence of any federally listed or state-listed endangered or threatened species; and (3) impacts to endangered and threatened species are minimized and mitigated to the maximum extent practicable. The BRMP shall contain at a minimum specific construction monitoring programs for thread-leaved brodiaea, arroyo toad, coastal California gnatcatcher, least Bell's vireo, and Pacific pocket mouse. | TCA | Prior to construction |
| Measure TE-4. Mitigation Measure TE-4 is the same as Mitigation Measure WV-5 in Section 8.11. See Mitigation Measure WV-5. | See Mitigation Measure WV-5 in Section 8.11 | See Mitigation Measure WV-5 in Section 8.11 |
| Measure TE-5. Chain-link, wire mesh with metal poles, or similar fencing of at least 2.1 m (seven ft) in height will be erected on both sides of the selected alternative from the underpass entrance to a distance of at least 1.0 km (0.62 mile) along the corridor to "funnel" wildlife to the underpass area and to minimize wildlife attempts to cross the roadway surface. Fence height up to three m (10 ft) in height will be used in areas deemed appropriate by the Project | Project Biologist, TCA, USFWS, FHWA and Caltrans | During final design and construction |

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| Biologist, TCA, USFWS, FHWA and Caltrans. In addition, in areas known to support the arroyo toad, a permanent mesh fence shall be installed at the base of the chain-link fence for at least 1.0 km (0.62 mile) to keep the toads from entering onto the roadway surface.<br><br>The width and the height of the wildlife bridges specified in this mitigation measure are those provided by Caltrans as minimum standards. This approach is appropriate and such detail can be provided during further discussions and only for the selected project. To demonstrate the success of this approach, the TCA has monitored seven wildlife undercrossings during the fall and spring of each year since 1999. The wildlife undercrossings are along the Foothill and Eastern Transportation Corridors and consist of bridges as well as large diameter culverts. Methods used to document the presence and diversity of wildlife using the undercrossings include scent stations, spotlight surveys, general scat surveys, and direct observations. The data have shown that there is a considerable amount of wildlife within the study area using the undercrossings. The wildlife observed using the undercrossings includes mountain lions, bobcats, coyotes, gray foxes, and mule deer. This usage demonstrates the overall success of the undercrossings in allowing wildlife continued movement throughout the region. In summary, preliminary results indicate that wildlife is continuing to use the undercrossings along the Toll Roads. | | |
| Measure TE-6. Prior to construction of the selected alternative, focused sensitive plant species surveys shall be conducted to determine the distribution of sensitive plants within the impact area of the selected alternative so appropriate avoidance, and seed collection and salvage measures for thread-leaved brodiaea can be implemented. This measure will ensure that the biologist obtains the current onsite conditions, just prior to construction, to maximize avoidance. Surveys shall be conducted from March through June which is the blooming period for this species. Locations of thread-leaved brodiaea species shall be mapped and shown on construction drawings and identified as ESAs. During final design, temporary access roads will be sited with the approval of the | Project Biologist | During final design and between March and June, prior to construction |

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| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
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| Project Biologist so as to avoid or minimize impacts to sensitive plant populations. | | |
| Measure TE-7.<br>a. Prior to construction (e.g., clearing, grubbing or grading), focused surveys for the thread-leaved brodiaea shall be conducted during the flowering period for this species (approximately March through June). The locations of plants identified within the disturbance limits shall be recorded with a Global Positioning System (GPS) unit with sub-meter accuracy. The soils containing thread-leaved brodiaea shall be tested to determine soil texture, and organic matter, and transported to a native plant nursery for germination and propagation.<br>b. Prior to construction, soil containing thread-leaved brodiaea corms within the impact area shall be collected by personnel experienced in the salvage of corms. Areas of soil 0.6 m by one m by 0.6 m (two ft by three ft by two ft) deep or one m by 1.3 m by 0.6 m (three ft by four ft by two ft) deep shall be collected and transported for placement in an appropriate translocation site selected by the Project Biologist. The translocation site shall be located in a conservation area within an open space dedication area within the region and shall have similar soils, aspect, slope, and hydrology to the donor site (i.e., the site from which thread-leaved brodiaea corns were collected).<br>c. Relocation success will be monitored for five years. The number of relocated plants that will emerge in any one year is variable and will depend on seasonal rainfall. Relocation will be considered successful when 10 percent of the relocated population emerges and sets viable seed in any monitoring year. The success criteria may vary as determined by the Project Biologist in consultation with botanists and USFWS staff with recent experience in brodiaea transplantation methodologies in the region. | Project Biologist | Between approximately March and June, prior to construction. Monitoring for five years post-relocation |
| Measure TE-8. To avoid impacting vernal marsh FEVM 16 and Riverside fairy shrimp from construction activities, this area shall be flagged and mapped. All construction roads and other construction related activities shall be redirected around this feature. The watershed which supplies this marsh shall also be | | |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

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| flagged for avoidance and enclosed with silt fencing per the direction of the Project Biologist to ensure that erosion/ground disturbance does not compromise water quality within the pool. Silt fencing shall remain intact for the duration of construction and until all disturbed soils have been stabilized. Following removal of the silt fencing, fiber rolls, or similar erosion control devices shall be placed around the pool to filter incoming runoff and reduce the potential for siltation or water turbidity until all earth moving activities have ceased and landscaping installed. See also RMP for all mitigation measures. | | |
| Measure TE-9. During final design, the TCA, as described in the RMP, shall design, construct, and/or maintain any structure/culvert placed within a stream where endangered or threatened fish do/may occur such that it does not constitute a barrier to upstream or downstream movement of aquatic life, or cause an avoidance reaction by fish that impedes their upstream or downstream movement. This includes, but is not limited to, the supply of water at an appropriate depth for fish migration. | TCA | During final design |
| Measure TE-10. An Arroyo Toad Resource Management Plan (ATRMP) will be prepared. The ATRMP will be incorporated into the BRMP, and action items identified in the plan will be implemented by TCA and monitored by the Project Biologist. The plan shall include measures detailing how the impact area will be surrounded with a silt fence enclosure, and how arroyo toads will be removed and relocated from the construction impact area during the breeding season (when they are detectable by vocalizations) and placed in suitable habitat either upstream or downstream of the selected alternative during construction. The ATRMP will identify areas of collection, suitable areas for temporary housing , and restoration guidelines to be in place prior to release of toads to their original location. The plan shall by submitted to the USFWS to the extent required by such agency. The locations of areas known to support arroyo toads shall be identified in the ATRMP and on the ESA maps to comply with the requirements of the biological opinion. | Project Biologist, with approval by USFWS | Prior to construction |
| Measure TE-11. Prior to initiating any ground-disturbing activities in occupied/suitable habitats, or habitats proximal to suitable or occupied habitats | Project Biologist | Prior to initiating any ground-disturbing activities |

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| for arroyo toad, exclusionary fencing shall be installed around the perimeter of the construction area. Fencing or screening approximately 60 cm (two ft) in height (30 cm [one ft] of which will be buried below the surface) shall be installed to prevent arroyo toads from entering the area after the onset of construction. The fencing will be installed at least 14 days prior to the initiation of work and must be made of a material appropriate to preclude any arroyo toads from entering the construction area. Fencing will be removed each winter during construction and at the end of project construction. Vehicle use will be restricted within areas known to support populations of the arroyo toad that are shown on the ESA maps. | | |
| Measure TE-12.<br>a. The Project Biologist shall conduct three focused arroyo toad surveys within the fenced construction site for arroyo toads a minimum of 14 nights prior to initiating project construction. If climatic conditions are not appropriate for arroyo toad movement during the surveys, the Project Biologist may attempt to illicit a response from the arroyo toads, during nights with temperatures of 13°C (55°F) or greater, by spraying the project area with water to simulate a rain event. During construction, arroyo toads surveys will be performed a minimum of once per week and on all nights where the combination of rain/humidity and temperature would increase the movement of arroyo toads.<br>b. If arroyo toads are found with the construction side of the exclusionary fencing, arroyo toads will be removed by the Project Biologist and relocated from the construction impact area and placed in suitable habitat either upstream or downstream of the construction area as outlined in the Arroyo Toad Resource Management Plan. | Project Biologist | Fourteen nights prior to initiating project construction and during construction |
| Measure TE-13. The Contractor shall locate staging areas for construction equipment outside of areas within the jurisdiction of the USACOE or CDFG known to support arroyo toad to minimize impacts to sandy creek benches that may provide aestivating habitat for the arroyo toad to avoid taking any individuals. | Contractor, with oversight by Project Biologist | Prior to and during construction |

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| Measure TE-14. When conducting construction and/or other ground-disturbing activities in arroyo toad-occupied habitats or in adjacent upland areas proximal to known arroyo toad habitats, the Contractor shall cover all grubbing spoils or other grading debris with plastic sheeting to prevent arroyo toads from opportunistically burrowing in these exposed and friable soil piles. This sheeting must be placed on the soil piles before sunset and shall remain on (during nighttime hours) for the duration of the construction/ground disturbing activities. The areas where these measures must be implemented shall be determined by the Project Biologist in coordination with the USFWS. If the sheeting does not remain in place due to unforeseen circumstances, (inclement weather or other disturbances) a biologist will monitor the soil piles for the arroyo toad. Any arroyo toads found within the soil piles will be removed and relocated as outlined in the Arroyo Toad Resource Management Plan | Contractor, with oversight by Project Biologist | When conducting construction and/or other ground-disturbing activities |
| Measure TE-15. The Contractor shall not drive upon construction roads or other roads/surfaces adjacent to arroyo toad occupied habitat after sunset. If the site must be accessed, a biologist permitted to handle arroyo toad must be present in the vehicle to identify any individuals on the road and the vehicle shall not exceed a speed of 16 km per hour (10 miles per hour) within these areas. | Contractor and Project Biologist | After sunset during grading and construction |
| Measure TE-16. Prior to construction, the Project Biologist shall document the area of pools and gravel bars within the temporary disturbance areas of creeks occupied by the Arroyo Toad. At the conclusion of construction, the TCA shall construct artificial pools and gravel bars within these temporary disturbance areas. The artificial pools and gravel bars shall provide potential breeding and aestivating habitat for arroyo toad. These areas will be identified and established by the Project Biologist in the BRMP. The artificial pools and gravel bars shall be equal to or greater in size than those areas impacted by project implementation. Because of the natural flooding and scouring conditions of the creeks within the study area, no maintenance of these areas will be required. The construction of these features shall not preclude required Caltrans bridge maintenance. Plans shall be submitted to USFWS for review and approval, to the extent required by such agency, prior to implementation. | TCA and Project Biologist | At the conclusion of construction |

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| Measure TE-14. When conducting construction and/or other ground-disturb activities in arroyo toad-occupied habitats or in adjacent upland areas proxi to known arroyo toad habitats, the Contractor shall cover all grubbing spoil other grading debris with plastic sheeting to prevent arroyo toads from opportunistically burrowing in these exposed and friable soil piles. This sh must be placed on the soil piles before sunset and shall remain on (during nighttime hours) for the duration of the construction/ground disturbing acti The areas where these measures must be implemented shall be determined the Project Biologist in coordination with the USFWS. If the sheeting does remain in place due to unforeseen circumstances, (inclement weather or ot disturbances) a biologist will monitor the soil piles for the arroyo toad. An arroyo toads found within the soil piles will be removed and relocated as outlined in the Arroyo Toad Resource Management Plan |
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| If no nest(s), nesting behavior, or brood rearing activities are detected, work may commence. Prior to and during work activities, the Project Biologist will locate any individual coastal California gnatcatchers on-site and direct operators to begin in an area away from the birds. The pattern of brushing/grubbing activities will be designed to optimize opportunities for flushed birds to be directed towards the open space areas in the vicinity of the impact area.<br><br>During construction, no activity will occur within approximately 150 m (500 ft) of active nests. | | |
| Measure TE-23. During final project design, an undercrossing shall be provided in the vicinity of the San Mateo North population of the Pacific pocket mouse for any alternative selected that occurs within this area. The undercrossing shall allow for potential movement of Pacific pocket mice under the alignment. The exact placement and design of the undercrossing shall be determined by the Project Biologist, in coordination with MCB Camp Pendleton and with USFWS during the Section 7 consultation. | Project Biologist, in consultation with MCB Camp Pendleton and USFWS | During final project design |
| Measure TE-24. Prior to the initiation of construction in areas within or proximal to known sites occupied by the Pacific pocket mouse, a Pacific Pocket Mouse Resource Management Plan (PPMRMP) shall be prepared and submitted to the USFWS for review to determine compliance with the biological opinion and incorporated into the BRMP. This plan shall identify the strategies available for minimizing impacts to comply with the no jeopardy standard of Section 7(a)2 of the Federal Endangered Species Act.<br><br>The PPMRMP shall identify conservation measures. These conservation measures will be consistent with the Biological opinion issued by the USFWS. Potential conservation measures may include:<br><br>a. Temporary construction measures—including temporary fencing: | Project Biologist with approval by USFWS | Prior to initiation of construction |

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| • Invasive species control<br>• Habitat management and enhancement<br>• Predator control<br>• Control of public access<br>• PPM population monitoring<br><br>Implementation of these conservation measures will be completed in conjunction with USFWS and the landowner, Marine Corp, Camp Pendleton.<br><br>b. Project Design Features—PPM<br><br>• Barriers along the boundary<br>• Minimization of roadway lighting<br>• Minimization of fire risk | | |
| Measure TE-25. Mitigation Measure TE-25 is the same as Mitigation Measure WV-11 in Section 8.11. See Mitigation Measure WV-11. | See Mitigation Measure WV-11 in Section 8.11. | See Mitigation Measure WV-11 in Section 8.11. |
| Measure TE-26. Mitigation Measure TE-26 is the same as Mitigation Measure WV-12 in Section 8.11. See Mitigation Measure WV-11. | See Mitigation Measure WV-12 in Section 8.11. | See Mitigation Measure WV-12 in Section 8.11. |
| Measure TE-27. Mitigation Measure TE-27 is the same as Mitigation Measure WV-38 in Section 8.11. See Mitigation Measure WV-38. | See Mitigation Measure WV-38 in Section 8.11. | See Mitigation Measure WV-38 in Section 8.11. |
| Measure TE-28. Mitigation Measure TE-28 is addressed through Mitigation Measure WV-39 in Section 8.11 and a separate measure is not necessary. See Mitigation Measure WV-39. | See Mitigation Measure WV-39 in Section 8.11 | See Mitigation Measure WV-39 in Section 8.11 |

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| Measure TE-29. Mitigation Measure TE-29 is the same as Mitigation Measure WV-40 in Section 8.11. See Mitigation Measure WV-40. | See Mitigation Measure WV-40 in Section 8.11 | See Mitigation Measure WV-40 in Section 8.11 |
| **Mitigation Measures Related to Wild and Scenic Rivers** | | |
| No mitigation required. | N/A | N/A |
| **Mitigation Measures Related to Costal Barriers** | | |
| No mitigation required | N/A | N/A |
| **Mitigation Measures Related to Costal Zone** | | |
| Mitigation measures for impacts in the Coastal Zone are found in the following topical areas for which coastal zone permitting is concerned: biological, cultural, paleontological and visual resources. Refer to Sections 8.10 (Mitigation Measures Related to Wetlands and Waters of the United States), 8.12 (Mitigation Measures Related to Threatened and Endangered Species), 8.16 (Mitigation Measures Related to Historic and Archaeological Resources), 8.18 (Mitigation Measures Related to Visual Resources) and 8.23 (Mitigation Measures Related to Paleontological Resources) for a description of these measures. | Refer to Sections 8.10 (Mitigation Measures Related to Wetlands and Waters of the United States), 8.12 (Mitigation Measures Related to Threatened and Endangered Species), 8.16 (Mitigation Measures Related to Historic and Archaeological Resources), 8.18 (Mitigation Measures Related to Visual Resources) and 8.23 (Mitigation Measures Related to Paleontological Resources) | Refer to Sections 8.10 (Mitigation Measures Related to Wetlands and Waters of the United States), 8.12 (Mitigation Measures Related to Threatened and Endangered Species), 8.16 (Mitigation Measures Related to Historic and Archaeological Resources), 8.18 (Mitigation Measures Related to Visual Resources) and 8.23 (Mitigation Measures Related to Paleontological Resources) |
| **Mitigation Measures Related to Historic and Archeological Resources** | | |
| Measure AR-1. Prior to the start of construction activity, a qualified archaeologist shall be retained by the TCA or other implementing | TCA and qualified archaeologist | Prior to the commencement of project grading |

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| agency/agencies to perform subsurface test level investigation and surface collection for all archaeological sites that have not had formal determinations of eligibility for listing on the NRHP. The test level report evaluating the site shall include a discussion of significance (scientific data potential), integrity (location, physical characteristics, and condition), mitigation recommendations, and cost estimates. Final mitigation shall be carried out based on the report recommendations, input by FHWA and SHPO, and a determination as to the site's disposition by the TCA with concurrence of the FHWA. Possible recommendations made by a qualified archaeologist include, but are not limited to, preservation, data recovery, or no mitigation necessary. In addition, TCA or other implementing agency/agencies shall retain a qualified Native American monitor to be present during the evaluation excavations for sites within the project area. Preference will be given to experienced Native American monitors who are members of the local tribal groups identified as having cultural ties to the study area. | | |
| Measure AR-2. In conjunction with the final design, the TCA or other implementing agency/agencies shall retain a qualified archaeologist to complete a suitable historic property treatment plan for all eligible cultural resources that will be impacted by the SOCTIIP. A final report of the data recovery operation shall be submitted to the TCA, Caltrans, and FHWA prior to any grading in the archaeological site areas. In addition, TCA or other implementing agency/agencies shall retain a qualified Native American monitor to be present during the treatment program for sites within the project area. Preference will be given to experienced Native American monitors who are members of the local tribal groups identified as having cultural ties to the study area. | TCA | In conjunction with the final design and prior to commencement of project grading |
| Measure AR-3. Prior to the start of construction activity, the TCA or other implementing agency/agencies shall retain a qualified archaeologist. The archaeologist shall establish procedures (monitoring plan) for archaeological resource surveillance, procedures for temporarily halting or redirecting work to permit the sampling, identification, and evaluation of the cultural resources, as appropriate. The archaeologist shall also be present at the pregrading conference | TCA and qualified archaeologist | Prior to initiation of grading and ongoing during grading activities |

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| to explain the established procedures based on a preapproved monitoring plan. If additional or unexpected archaeological resources are discovered, a qualified archaeologist shall determine appropriate actions, in cooperation with the TCA, for testing and/or data recovery. The archaeologist shall submit a follow-up report to the TCA that shall include the period of inspection, an analysis of any artifacts found, the results of any testing or data recovery, and the present repository of the artifacts. In addition, TCA or other implementing agency/agencies shall retain a qualified Native American monitor to be present during ground-disturbing construction activities within the project area. Preference will be given to experienced Native American monitors who are members of the local tribal groups identified as having cultural ties to the study area. | | |
| Measure AR-4. In conjunction with the final design, the TCA will investigate various design features, including options for reversibility of design (i.e., avoidance of core areas, minimization of cut, maximization of fill, bridge structure on columns), in the vicinity of the Village of Panhe (within the San Mateo Archaeological National Register District) that could assist in minimizing impacts to the District as a result of the selected Alternative. If it is determined that a design feature can feasibly assist in minimizing impacts to the District, the TCA will incorporate this feature in the final design for the selected Alternative. | TCA | At the time of final design |
| Measure HR-1. Prior to the start of construction activity (project related demolition), the TCA or other implementing agency/agencies shall retain a qualified architectural historian/historical architect to record National Register of Historic Places listed or eligible buildings, structures, and objects that will be removed by the Alternative, according to Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) standards. The documentation will be performed in consultation with the National Park Service (NPS), and the State Office of Historic Preservation (OHP). HABS/HAER documents utilize the Secretary of the Interior's *Standards for Architectural and Engineering Documentation*, which is linked to the Secretary's *Guidelines for Architectural and Engineering Documentation* and the HABS/HAER | | |

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| Procedures Manual which provide more specific guidance and technical information. The level of documentation for each individual resource or district will be determined in consultation with NPS, but may include:<br><br>Drawings: a full set of measured drawings depicting existing and historic conditions.<br><br>Photographs: photographs with large format negatives of exterior and interior views, photocopies with large format negatives of select existing drawings or historic views where available.<br><br>Written data: history and description. HABS/HAER recordation for each resource should update and augment any previously completed documentation of the resource. Documentation should be completed within 180 days of the FHWA approval of the SOCTIIP project. The product should be submitted to the NPS for review and addition to the HABS/HAER collection maintained by the Library of Congress. Copies of the document should also be provided to local institutions or agencies (planning/community development departments, public libraries, historical societies) and made available for public review. | | |
| Measure HR-2. The TCA or other implementing agency/agencies in consultation with local agencies and the SHPO, shall create a permanent display for historic buildings within a local facility readily accessible to the public, (such as such as public libraries, museums, or schools) that will interpret the history and construction of the resource and its historical context. The interpretive display may consist of durable panels and should include items such as: reproductions of historical photographs, original construction drawings, or other drawings, drawings and photographs that are part of HABS/HAER documentation completed as part of the mitigation measures, and explanatory text. Items such as reproductions or actual architectural elements, discarded hardware, or other items used in the original construction may also be incorporated, as may oral histories collected from individuals associated with the resource in text, audio, | | |

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| and/or video format. The interpretive display should be completed and in place prior to initiation of operations on any part of the selected corridor. | | |
| Measure HR-3. The TCA or other implementing agency/agencies in consultation with the local agencies and SHPO, shall create an internet website on the worldwide web that will interpret the resource impacted by the proposed construction. The website should include written explanatory text discussing the history and context of the resource, historic and contemporary photographs of the resource, drawings and/or diagrams as appropriate. It may also include oral histories collected from individuals associated with the resource, in text, audio, and/or streaming video format. The website may be a stand alone site, or linked to existing websites maintained by local or county historical organizations. The interpretive website should be completed and accessible prior to initiation of operations on the selected corridor. | | |
| Measure HR-4. In the event that design of the project requires the demolition of any Federal, State, or locally listed or eligible historical resource, the TCA or other implementing agency/agencies shall, with the approval of the responsible municipal agency, salvage any historical elements or fittings of the structure(s) which may be useful for reuse or display prior to the commencement of any alteration, grading, or demolition of the site. | | |
| **Mitigation Measures Related to Hazardous Materials and Hazardous Waste Sites** | | |
| Measure HM-1: Testing For Contaminated Groundwater. Groundwater testing for the presence of pesticides, nitrates, metals and petroleum hydrocarbons will be required by the Regional Water Quality Control Board (RWQCB) prior to construction in all areas where excavation may extend into groundwater based on final design criteria. All wastewater generated during construction will meet all applicable requirements of the RWQCB prior to disposal. | TCA, in accordance with RWQCB requirements | Prior to construction in areas where excavation may extend into groundwater |
| Measure HM-2: Aerially Deposited Lead. In areas immediately adjacent to existing roads proposed for construction (I-5, arterials), soil samples will be collected and analyzed for lead concentrations during final design, consistent with "Lead Testing Recommendations for Districts with Aerially Deposited Lead (ADL) Variance" (Caltrans 2001), "Invoking the Aerially Deposited Lead | TCA | During final design |

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| Variance" (Caltrans, no date), DTSC "Variance 00-H-VAR-07," and Standard Special Provision SSP 19-900, S5-740. If lead-affected soil is found, the results/conclusions will be included in the Site Investigation Report, the Standard Special Provisions (SSP) and the Material Information Handout (MIH). The SSP and MIH will be incorporated in design specifications and will include measures to safeguard public health before and during construction. Depending on the concentrations and volumes encountered, excavation and disposal of lead-impacted soil may be required. If such excavation is indicated, procedures for handling and disposal will be included in the design specifications. Soil contaminated with ADL will be removed and disposed of, in concurrence with the variance issued to the California Department of Transportation (Caltrans) by the California Department of Toxic Substances Control (DTSC). This material may be reused for embankment fill, retaining wall backfill and/or capped with an appropriate amount of clean fill material. Specifically, DTSC granted Caltrans a variance in 2000 to allow for the use of some lead contaminated soils for fill and backfill during construction of freeway improvements, provided that Caltrans' handling and use of those soils are consistent with the conditions, limitation and requirements described in that variance. A copy of that variance is available for review at the Caltrans District 12 office. This variance is valid through September 22, 2005 per Caltrans and will need to be renewed. It is anticipated that all of the lead contaminated soil in the SOCTIIP study area affected by the Alternatives would be used during the construction of the proposed project. Although there is not expected to be the need to remove and dispose of any lead contaminated soil off site during construction, any excess contaminated soil would be disposed of consistent with all applicable federal, state and local regulations | | |
| Measure HM-3: Agricultural Lands. Prior to grading in agricultural areas, a soil sampling plan and a worker health and safety plan will be prepared and implemented to identify areas of chemically affected soils to minimize the risk of exposure to worker safety during construction. The soil sampling plan will include appropriate sampling criteria for screening excavated soils by profiling | TCA and Contractor | Prior to grading in agricultural areas and ongoing during project |

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| for reuse or disposal, as appropriate. Surface soil samples within the disturbance limits will be collected and analyzed for pesticide and herbicide residues. If elevated residue levels are detected, a Risk Management Plan (RMP) for the impacted soil will be developed and implemented during construction. | | |
| Measure HM-4: Abandoned Oils Wells or Test Borings. The abandoned oil wells and test borings will be positively located and any remaining components (such as steel surface casings) will be removed before grading. In the event that an undocumented oil well or test boring is encountered during construction of any SOCTIIP Alternative, reabandonment of the well or boring will be implemented to comply with applicable California Department of Oil and Gas (CDOG) requirements. | Geotechnical engineer and/or geologist | Prior to project grading |
| Measure HM-5: Asbestos Containing Building Materials. Consistent with the requirements of the South Coast Air Quality Management District (SCAQMD), asbestos sampling and notification will be implemented prior to any demolition or renovation of existing bridges, road structures or buildings. All asbestos contain building waste materials will be properly handled and disposed of consistent with all applicable federal, state and local regulations. Formal notification to SCAQMD will be made at least 10 days before any demolition work, regardless of whether or not asbestos is known to be present. | TCA and Contractor | Prior to demolition or renovation of existing bridges, road structures or buildings |
| Measure HM-6: Hazardous Materials in Highway Infrastructure. If any existing thermoplastic or painted traffic stripes on existing roads are proposed for removal, testing of those stripes will be performed prior to construction to assess the level of lead and chromium. The testing will identify specific actions that will be implemented to safely remove and dispose of these stripes. It is also possible that some components of bridges or other highway infrastructure may include asbestos-containing materials (ACMs). Building materials in all structures slated for demolition will be surveyed for asbestos content before demolition begins and any materials found to be ACMS will be removed (abated) before demolition, as described in measure HM-5. | TCA and Contractor | Prior to construction |
| Measure HM-7: Construction Related Hazardous Materials. All construction activities will be required to comply with existing federal, state and local | TCA and Contractor | Ongoing during construction |

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| regulations regarding the handling, use, storage and disposal of hazardous materials, including specific regulations on response in the event of accidental release. | | |
| Measure HM-8: Hazardous Materials Associated with Existing Utilities. If leakage or damage from existing utilities is identified during construction, appropriate containment and remedial measures will be implemented, as necessary, in consultation with the affected utility provider and in compliance with existing local, state and federal regulations. | TCA and Contractor and affected utility | Ongoing during construction |
| Measure HM-9: Alignment Specific Database Review. During final design, an updated regulatory database report will be obtained and regulatory records for identified sites of concern, such as leaking underground storage tank locations, will be reviewed. The intent of obtaining and reviewing this updated information will be to evaluate changes in, or the progress of, ongoing monitoring and remediation activities at those properties within or immediately adjacent to the disturbance limits for the selected Alternative. The results of this additional database and records review will be used in developing the final construction plans and schedules. | TCA and Contractor | During final design |
| Measure HM-10: Underground Storage Tanks. The removal of underground storage tanks, if any are affected, will be coordinated by the facility tenant or property owner (which could be the current owner, the TCA, Caltrans or the applicable local jurisdiction), and regulatory closure would be directed and approved by the applicable local oversight regulatory agency. These local oversight regulatory agencies may include the Orange County Health Care Agency, San Diego Hazardous Materials Management District and/or the San Diego and/or Santa Ana Regional Water Quality Control Boards (RWQCBs). Appropriate mitigation will include monitoring the progress of UST closure activities through periodically updating the regulatory database review. | | |
| Measure HM-11: Prima Deshecha Sanitary Landfill. Measure HM-11 is not applicable to the Preferred Alternative. | N/A | N/A |
| Measure HM-12: Hazardous Materials Sites. During final design, existing businesses within the disturbance limits will be evaluated related to hazardous | TCA and Contractor | During final design and prior to, or during, construction |

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|---|---|---|
| materials concerns to identify areas where soil sampling is warranted. Based on this reevaluation, subsurface sampling may be conducted to evaluate the presence of previous chemical releases associated with these types of land uses. Identified contamination will be remediated prior to or during construction of the selected Alternative. The right-of-way acquisition process will specifically address the need for hazardous materials remediation. Remediation, consistent with regulatory requirements and standards, will fully mitigate adverse impacts associated with existing hazardous materials or wastes sites on property acquired for the selected Alternative. | | |
| Measure HM-13: Camp Pendleton. The Department of the Navy (DON) will be consulted and a review of current United States Environmental Protection Agency (EPA) files will be conducted during final design to evaluate whether National Priorities List (NPL) records indicate that hazardous materials releases have occurred beneath the northwestern part of the Base, which may impact the SOCTIIP build Alternative. Current regulatory records pertaining to the integrity of the USTs and associated piping at the Base gas station will be reviewed. In the event that the regulatory files lack records of monitoring or UST integrity test results, subsurface sampling activities will be conducted, including confirmation soil sampling conducted within the disturbance limits of the build Alternative. Evaluation of potentially impacted or environmentally impaired properties will be performed prior to acquisition in order to determine the degree of environmental risk and liability for both the buyer and seller. | TCA and Contractor, in consultation with DON | During final design and prior to acquisition |
| Measure HM-14: Camp Pendleton. The right-of-way easement granted by the DON to the TCA (for a non-corridor Alternative) shall contain the following provisions: 1) procedures for control and manifesting of hazardous waste generated by construction or maintenance activities; 2) Assignment of responsibility for hazardous waste management, spill accountability, and hazardous waste disposal (including manifesting); 3) The EPA identification (ID) number to be used to manifest hazardous wastes; 4) Responsibility for acquisition of any required health permits; 5) Procedures for management of HW stored on Camp Pendleton property; 6) Assignment of responsibility for | DON | Prior to acceptance of right-of-way easement |

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| any Notices of Violation or other regulatory enforcement actions occurring within the Alternative right-of-way during construction or operation of the SOCTIIP project. | | |
| Measure HM-15: TRW Capistrano Test Site. The groundwater well shall be sampled and abandoned in a cooperative effort with TRW in accordance with applicable regulatory guidelines if necessary. | TCA and Contractor | Prior to site acquisition |
| Measure HM-16: Petroleum Pipeline. If records of pipeline integrity testing are unavailable, a soil screening program, including the collection and analysis of soil samples beneath the pipeline, will be implemented in a cooperative effort with Kinder Morgan, the pipeline operator. The soil sampling will be conducted to evaluate the presence of chemically affected soil. If contaminated soil is documented associated with this pipeline, appropriate remediation in compliance with existing local, state and federal regulations will be implemented, in conjunction with Kinder Morgan. | TCA and Contractor, in conjunction with Kinder Morgan | Prior to construction |
| Measure HM-17: Electrical Substations. If the final design for a build Alternative calls for the relocation of oil cooled and/or lubricated electrical equipment at existing electrical substations, the TCA will coordinate with the owner of the substation during final design to determine whether an evaluation of soils beneath the relocated equipment is necessary and appropriate. The TCA would also coordinate with the owner of the substation regarding the remediation of any contaminated soil associated with the affected electrical equipment, consistent with applicable local, state and federal regulations. | TCA and affected utility provider | During final design |
| Measure HM-18: Previously Unknown Hazardous Materials Encountered During Construction. If previously unknown hazardous materials or objects that could contain hazardous materials (such as an undocumented underground storage tank) are discovered during construction, construction personnel will notify TCA immediately and implement measures to control and characterize the materials encountered, including notification of hazardous materials emergency response personnel as appropriate. Characterization of the possible hazardous materials will be similar to the provisions of HM-12. The construction contractor will provide for this contingency in the Health and | Construction personnel and construction contractor | During construction |

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|---|---|---|
| Safety Plan for the project. | | |
| NES Measure 12 for Construction Storage. During all construction activities, the contractor shall ensure that construction equipment or vehicles shall not be stored within areas defined as Environmentally Sensitive Areas (ESAs), including areas within the jurisdiction of the ACOE and/or CDFG. There shall be no fueling, lubrication, storage, or maintenance of construction equipment within 46 m (150 ft) of CDFG or ACOE jurisdictional areas. | Contractor | Ongoing during construction |
| NES Measure 13 for Construction Disposal. NES measure 13 is the same as Mitigation Measure WW-8 in Section 8.10. | See Mitigation Measure WW-8 in Section 8.10 | See Mitigation Measure WW-8 in Section 8.10 |
| **Mitigation Measures Related to Visual Resources** | | |
| Measure AS-1. Adjacent landforms affected shall be recontoured to a 2:1 slope or as determined appropriate through geotechnical investigation to provide a smooth and gradual transition between modified landforms and existing grade and to minimize the appearance of manufactured grading. Use of crib-type retaining walls in place of slopes shall be minimized, except where necessary to provide greater landform diversity, reduce fill slopes, minimize long, flat slope surfaces or potentially salvage rock outcroppings. In areas where sensitive habitat is not prevalent, the top and toe of the slope edges shall be rounded to reduce the angular effects of manufactured grading. The top of slopes where the surface breaks the horizon or ridgeline shall be undulated to avoid a straight edge along the skyline. For slopes greater than 20 m (65.6 feet), terrace drains shall be used to break up slope surfaces.<br><br>The TCA shall prepare Aesthetic Design Guidelines for the project, similar to the guidelines for the San Joaquin Hills Transportation Corridor and the Foothill/Eastern Transportation Corridor. It is not possible to provide these guidelines at this stage of the project. The guidelines will be developed during final design of a preferred Alternative. The Design Guidelines shall specifically address grading, berm design, slopes, benches and the incorporation of sound and retaining walls. These Guidelines will be used in conjunction with the | TCA | During final design |

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| Landscape Design Guidelines described in measure AS-2 to minimize the visual impacts of the build Alternatives. | | |
| Measure AS-2. The TCA shall prepare Landscape Design Guidelines that will specify plant species that will either be seeded or planted on all exposed areas such that these areas will blend with the surrounding vegetated areas. Native vegetation shall be placed in appropriate locations and densities to fit into the natural setting. Landscaping with varied height and species diversity shall be used and material selection, location of native plant materials and sculptured grading shall emulate the adjacent natural setting. Terrace drains shall be screened with periodic placement of native plant materials in a random manner to help blend these drainage facilities into the slope and not unintentionally emphasize these facilities. The Landscape Design Guidelines will include the locations of the shrubs and/or vining species, where appropriate, at the base of soundwalls to blend these structures as much as possible with the surrounding areas. All landscaping treatments and materials shall be consistent with the Landscape Design Guidelines. | TCA | During final design |
| Measure AS-3. Lighting per Caltrans policies and procedures as set forth in the Caltrans Traffic Manual shall be installed by the TCA along the corridor. Lighting shall be such that Partial Interchange Lighting (PIL) with two electroliers at each interchange ramp, positioned per Caltrans standards, is provided. Additional and/or supplemental lighting shall be provided where necessary for safety. Toll collection plazas and their adjacent roadways shall be continuously lit. The mainline corridor shall not be continuously lit. | TCA | Final design and during construction |
| Measure AS-4. In conjunction with operation of the corridor Alternatives, light shall be applied as effectively as possible by the TCA, minimizing both the glare of any light source and the spillover of light onto areas outside of the corridor right-of-way . The vertical or horizontal illuminance from roadway lighting sources shall not illuminate any surface outside of the right-of-way greater than 1/10 of the road's average horizontal illuminance. On the segment through The Donna O'Neill Conservancy, there shall be no illumination of any surface in The Conservancy outside the right-of-way of the SOCTIIP Alternative due to | TCA | Final design and during construction |

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|---|---|---|
| roadway lighting sources installed by the TCA | | |
| **Mitigation Measures Related to Energy** | | |
| No mitigation required | N/A | N/A |
| **Mitigation Measures Related to Earth Resources** | | |
| Measure G-1. Prior to final design a design level geotechnical report will be prepared. This report will document potential soil-related constraints and hazards such as slope instability, settlement, liquefaction or related secondary seismic impacts that may be present. Acceptance of the report will be subject to approval by the TCA and other agencies that may have jurisdiction. A minimum factor of safety of 1.5 shall be used to determine the final slope configuration. The report shall also include:<br>• Evaluation of potentially expansive soils and recommendations regarding construction procedures and/or design criteria to minimize the effect of these soils on the development of the corridor.<br><br>The design level geotechnical studies will identify potentially liquefiable areas and provide recommendations for mitigation. Any areas that require mitigation would be within the disturbed areas, and no additional impacts would result. | TCA | Prior to final design |
| Measure G-2. In conjunction with final design, it will be demonstrated that side slopes shall be designed and graded so that the potential for surface erosion of the engineered fill is not increased from natural conditions. | TCA | At the time of final design |
| Measure G-3. In conjunction with construction activity, native vegetation with good soil-binding characteristics and low water requirements will be planted on engineered slopes to reduce erosion and slope instability. | TCA | During construction |
| Measure G-4. A quality assurance/quality control plan will be maintained during construction. This will include observing, monitoring and testing by a geotechnical engineer and/or geologist during construction to confirm that geotechnical/geologic recommendations are fulfilled, or if different site conditions are encountered, appropriate changes are made to accommodate such issues. | Contractor and geotechnical engineer and/or geologist | During construction |

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| Measure G-5. A detailed review will be made to locate all groundwater wells within the project footprint. Any groundwater wells that occur within the project footprint will be abandoned properly during project construction. As may be required, (i.e., for active wells), the water supply provided by the well will be replaced. Replacement water may be provided by a variety of means, such as installing a new well or a connection to municipal supply. | TCA and Contractor | At the time of final design |
| **Mitigation Measures Related to Military Uses** | | |
| Measure M-1: Nighttime Lighting and Shielding. During construction on or in the immediate vicinity of Camp Pendleton, to minimize conflicts with night training by Base personnel, the following will be implemented:<br>• Construction lighting requirements during evening and night activities will be adjusted with proper shielding to focus illumination downwards in designated work areas. To accomplish this, lighting fixtures will be fitted and hooded to minimize the spillage of light in an upward direction and on adjacent properties. Lighting will be designed to use the latest style of lighting (known as "mused lighting") to reduce the impact on night vision goggle training activities.<br>• Fixed lighting will not exceed the minimum needed to meet Caltrans standards. Lighting will be shrouded to reduce backscatter and vertical light pollution and will be of a type to minimize effects on adaptation to darkness and changes in light levels.<br>• A design review memoranda will be produced by the Contractor indicating that lighting design and materials used to minimize light and glare during construction are consistent with the requirements of this mitigation measure.<br><br>Cranes which would remain extended to a height of 12.2 meters (40 feet) above ground level (AGL) or higher during night-time hours must include the use of a Federal Aviation Administration (FAA) approved aircraft obstruction light mounted at the highest point of the equipment's extension AGL. The aircraft | TCA, Contractor and Camp Pendleton personnel | During construction on or in the immediate vicinity of Camp Pendleton |

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| obstruction light must be operational from 30 minutes before sunset until 30 minutes after sunrise each day the equipment is in place and extended above 12.2 meters (40 feet) AGL overnight. | | |
| Measure M-2: Access and Coordination. Construction activities and equipment movement could adversely impact the movement of troops and use of ranges during construction. These impacts will be mitigated by coordination among the TCA, the Contractor and Camp Pendleton personnel. Specifically, the Contractor will identify access routes, staging areas and all expected movement corridors during construction and will produce a design review memoranda/exhibit. These will be reviewed with the TCA and Camp Pendleton personnel to ensure construction activity impacts on Base training are minimized. | TCA, Contractor and Camp Pendleton personnel | During construction on or in the immediate vicinity of Camp Pendleton |
| Measure M-3: Base Security During Construction. Prior to final design, security measures shall be incorporated into the project construction specifications to ensure that construction workers and others cannot access the Base from the construction areas. These security measures shall be designed in consultation with Camp Pendleton and shall be in the form of physical barriers including but not limited to walls and fencing. These security measures shall be implemented prior to any project related construction and shall be adequately maintained throughout the construction period. | TCA, Contractor and Camp Pendleton personnel | Prior to final design and throughout construction |
| Measure M-4: Nighttime Lighting and Shielding. During operation on or immediately adjacent to Camp Pendleton, to minimize conflicts with night training by Base personnel, permanent night lighting will be adjusted with proper shielding to focus illumination downwards. Lighting fixtures will be fitted and hooded to minimize the spillage of light in an upward direction and on adjacent properties including the Base. Lighting will be designed to use the latest style of lighting (known as "mused lighting") to further minimize potential glare effects on the Base. This design will be implemented at all places on and adjacent to the Base requiring lighting along the road including interchanges and the mainline. To reduce the impact on night vision goggle training activities, fixed lighting on and immediately adjacent to the Base will not exceed the | TCA, Contractor and Camp Pendleton personnel | During project operation |

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| minimum needed to meet Caltrans standards. Lighting on and immediately adjacent to the Base will be shrouded to reduce backscatter and vertical light pollution and should be of a type to minimize effects on adaptation to darkness and changes in light levels.<br><br>A design review memoranda will be produced by the Contractor indicating that lighting design and materials used to minimize light and glare during operation on and immediately adjacent to the Base are consistent with the requirements of this mitigation measure. | | |
| Measure M-5: Land Use Fragmentation/Ground Training. To reduce impacts associated with the fragmentation of land available on Camp Pendleton and to avoid creating a parcel on the Base fully fragmented and inaccessible from the rest of the Base, two underpasses will be constructed to provide clearance for military personnel and equipment movement. The underpasses will be sized and designed to accommodate the equipment and personnel needs as may be defined by the Marine Corps and the DON. | TCA, Contractor and Camp Pendleton personnel | Prior to final design and during construction |
| Measure M-6: Base Security. Prior to final design, security measures shall be incorporated into the project design to ensure that users of the corridor cannot access the Base. These measures shall be designed in consultation with Camp Pendleton and shall be in the form of physical barriers including but not limited to walls and fencing. These security measures shall be implemented and fully operable prior to public access to the corridor. | TCA, Contractor and Camp Pendleton personnel | Prior to final design and prior to public access to corridor |
| **Mitigation Measures Related to Mineral Resources** | | |
| The mitigation measure concerning impacts to the mineral resources is SE-2. Refer to Section 8.4 (Socioeconomics and Environmental Justice) for a description of this measure. | See Measures WQ-1 to WQ-4 from Section 8.9 | See Measures WQ-1 to WQ-4 from Section 8.9 |
| **Mitigation Measures Related to Paleontological Resources** | | |
| Measure P-1: Pre-Construction Salvage. Prior to the start of any earthmoving activity, an Orange County Certified (OCC) Paleontologist will be retained to conduct pregrading salvage of any significant exposed fossils identified by the OCC Paleontologist prior to any heavy equipment activity in a particular area. | OCC Paleontologist | Prior to the initiation of grading |

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| Paleontological monitoring of brush removal shall be performed by a qualified paleontologist, under the supervision of an OCC Paleontologist, to locate and salvage additional significant fossil remains not previously visible. The OCC Paleontologist shall prepare a paleontological technical report that includes methodology, results, and an inventory list of significant fossils recovered. | | |
| Measure P-2: Monitoring Procedures. Prior to the start of any earthmoving activity, an OCC Paleontologist shall be retained to establish procedures, following these mitigation guidelines set forth in this Paleontological Resources Technical Report, for paleontological resource monitoring by qualified paleontological monitors during grading, and procedures for temporarily halting or redirecting work to permit the sampling, identification and evaluation of the fossils as appropriate. The OCC Paleontologist shall also establish emergency procedures applicable to the discovery of unanticipated significant paleontological resources (e.g. large specimens or significant concentrations of specimens as determined by the OCC Paleontologist). The OCC Paleontologist shall be present at the pregrading conference to explain the established procedures to the construction contractors. | OCC Paleontologist | Prior to the initiation of grading |
| Measure P-3: Construction Monitoring. During all construction activities which involve soil disturbance, the following activities will be conducted:<br>a. An OCC Paleontologist will be retained to supervise monitoring of construction excavations and to produce a mitigation plan for the proposed project. Paleontological monitoring will include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. The monitor will have authority to temporarily divert grading away from exposed fossils in order to recover the fossil specimens.<br>b. If microfossils are present, the monitor will collect matrix for processing. In order to expedite removal of fossiliferous matrix, the monitor may request heavy machinery assistance to move large quantities of matrix out of the path of construction to designated stockpile areas. Testing of stockpiles will consist of screen washing small samples (approximately 90 kilograms, or 200 pounds) to determine if significant fossils are present. Productive tests | OCC Paleontologist | During grading and all construction activities that involve soil disturbance, and at the conclusion of project grading |

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| will result in screen washing of additional matrix from the stockpiles to a maximum of 2,700 kg (6,000 lbs) per locality to ensure recovery of a scientifically significant sample.<br>c. Younger Quaternary Alluvium, San Onofre Breccia and Quaternary Landslide Deposits have a low or indeterminate paleontological sensitivity level, and will be spot-checked in a periodic basis to insure that older underlying sediments are not being penetrated and fossils are not being exposed. All earth-moving in the Williams Formation, Silverado Formation, Santiago Formation, Sespe Formation, Vaqueros Formation, Sespe/Vaqueros Undifferentiated, Topanga Formation, Monterey Formation, Capistrano Formation, Niguel Formation, Older Quaternary Alluvium and Quaternary Marine and Non-Marine Terrace Deposits will be monitored full-time. The moderate to high paleontological sensitivity of these formations requires a maximum effort to recover fossils.<br>d. The Orange County Certified Paleontologist will prepare monthly progress reports to be filed with the client and the lead agencies.<br>e. Recovered fossils will be prepared to the point of curation, identified by qualified experts, listed in a database to allow analysis, and deposited in a designated repository such as a County of Orange facility, which shall have the first right-of-refusal of the collection, or the Natural History Museum of Los Angeles County or San Diego Natural History Museum.<br>f. At each fossil locality, field data forms will record the locality, stratigraphic columns will be measured and appropriate scientific samples submitted for analysis.<br><br>The Orange County Certified Paleontologist will prepare a final mitigation report to be filed with the client, the lead agencies, and the repository. | | |
| **Mitigation Measures Related to Public Services and Utilities** | | |
| **Mitigation Measures for Public Services** | | |
| Measure PS-1: Avoidance of the Temporary Use and/or Permanent Acquisition of Public Services and Utilities Property. During final design, the TCA will | TCA | During final design |

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| refine the design to the extent feasible based on engineering judgment and design standards to avoid or minimize the temporary use during construction and the permanent acquisition of land currently occupied by public services and utilities. In the event that the temporary use or permanent acquisition of this property cannot be avoided through design refinements, other mitigation measures identified for the compensation of temporary and permanent use of public services and utilities property will apply to the build Alternatives | | |
| Measure PS-2: Fire Protection. During construction, in areas subject to wildland fires as determined by the OCFA, or the MCB Camp Pendleton Fire Department for areas on MCB Camp Pendleton, the contractor will be required to install signs around construction sites warning of high fire risk and of area closings during the high fire season as declared by OCFA or the MCB Camp Pendleton Fire Department | Contractor | During construction in areas subject to wildland fires |
| Measure PS-3: Fire Protection. During operation Caltrans will install signs along the new or improved road segments in areas subject to wildland fires as determined by the OCFA, or the MCB Camp Pendleton Fire Department for areas on MCB Camp Pendleton, warning of high fire risk and of area closings during the high fire season declared by OCFA and the MCB Camp Pendleton Fire Department. | Caltrans | Ongoing during operation of the project |
| Measure PS-4: Fire Protection. Emergency call boxes will be installed along the road in undeveloped areas of high and extreme fire hazard, consistent with existing OCFA, Orange County Transportation Authority, Caltrans, TCA and/or local jurisdiction, as appropriate, policies on emergency call boxes. | Caltrans and/or local jurisdiction | Ongoing during operation of the project |
| Measure PS-5: Fire Protection. During construction of a build Alternative, the contractor will be required to maintain access to the existing fire road grid for the OCFA, and the MCB Camp Pendleton Fire Department for areas on MCB Camp Pendleton. | Contractor | During construction |
| Measure PS-6: Fire Protection. During final design, the long term preservation/provision of access to the existing fire road grid for the OCFA, and the MCB Camp Pendleton Fire Department for areas on MCB Camp Pendleton, will be incorporated in the facility design, in consultation with the OCFA and | TCA | During final design |

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| the MCB Camp Pendleton Fire Department. | | |
| Measure PS-7: Fire Protection. During construction, the contractor will implement fuel modification techniques as required by the OCFA, and the MCB Camp Pendleton Fire Department in areas on MCB Camp Pendleton, in areas of fire hazard as determined by the OCFA and the MCB Camp Pendleton Fire Department. | Contractor | During construction |
| Measure PS-8: Fire, Emergency Medical and Law Enforcement. During final design, the TCA, Caltrans and/or the City of San Clemente, as appropriate, will coordinate the addition of OPTICON or other traffic pre-emption devices as used in the City of San Clemente with the City's traffic engineer. These devices will be provided at impacted intersections, as identified in the Traffic Technical Report, to reduce impacts to fire, medical emergency and law enforcement response times. | TCA, Caltrans and/or the City of San Clemente | During final design |
| Measure PS-9: Fire, Emergency Medical and Law Enforcement. During construction the TCA will require the contractor to coordinate all temporary ramp closures and detour plans with fire, emergency medical and law enforcement providers to minimize temporary delays in response times. | Contractor | During construction |
| Measure PS-10: Law Enforcement. Prior to operation, the State of California shall solicit a transfer of concurrent legal (law enforcement) jurisdiction from the federal government to the State for any part of an Alternative that crosses MCB Camp Pendleton as provided in Section 2851 of the Fiscal Year 1999 National Defense Authorization Act (H.R. 3616). | State of California | Prior to operation |
| Measure PS-13: Solid Waste. Prior to construction of a build Alternative which will generate excess fill, the contractor will be required to offer fill for use in other development projects or to area landfills as daily cover. Landfilling of excess soil and rock material will be considered the option of last resort. | Contractor | Prior to construction |
| PS-13A: Solid Waste. Excess fill material from construction will not be disposed of at MCB Camp Pendleton landfills, unless such disposal is approved in advance though mutual agreement with the Environmental Security Department's Solid Waste Branch. If Base agreement for such disposal is granted, the contractor shall be responsible for hauling the materials to the Base | Contractor | During construction |

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| landfill(s) and for complying with all Base regulations regarding the transport and disposal of that material on the Base. | | |
| Measure PS-14: Direct Permanent Impacts on Schools. Measure PS-14 is not applicable to the Preferred Alternative. | N/A | N/A |
| Measure PS-15: Direct Temporary Impacts on Schools. Measure PS-15 is not applicable to the Preferred Alternative. | N/A | N/A |
| Measure PS-16: Public Facilities. Measure PS-16 is not applicable to the Preferred Alternative. | N/A | N/A |
| **Mitigation Measures for Public Utilities** | | |
| Measure U-1: Utilities. As early as possible during final design, the TCA will consult with each utility provider/owner to avoid or reduce potential impacts on existing and planned utilities through design refinements. Should impacts be unavoidable, all affected facilities shall be relocated or protected in place prior to, during or after construction, as appropriate, and in accordance with the methods and designs approved by the affected utility provider/owner. For utilities located on MCB Camp Pendleton, as early as possible the TCA will consult with and receive approval from the Marine Corps on any utility relocations or realignments prior to discussing the proposed activities with utility providers. | TCA | During final design |
| Measure U-2: Temporary Use and Permanent Acquisition. Consistent with requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, the TCA will negotiate with utility providers whose facilities will be temporary used and/or permanently acquired to determine appropriate action and/or compensation to mitigate for the temporary use and/or permanent acquisition of their property. | TCA | Prior to construction |
| Measure U-3: MCB Camp Pendleton Percolation Ponds. Consistent with requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 appropriate action and compensation to reduce the effect of the encroachment on MCB Camp Pendleton will be negotiated with the Department of the Navy. | TCA | Prior to construction |

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| **Mitigation Measures Related to Recreation Resources** | | |
| Mitigation measures concerning impacts to recreation are R-1 to R-5. Refer to Section 8.5 (Mitigation Measures Related to Pedestrian and Bicycle Facilities) for a description of these measures. | See Measures WQ-1 to WQ-4 from Section 8.9 | See Measures WQ-1 to WQ-4 from Section 8.9 |
| **Project Design Features:** | | |
| All the build Alternatives include several project design features (PDFs) intended to reduce and minimize the potential environmental impacts of the SOCTIIP build Alternatives on the human and natural environments. These PDFs include bridges for wildlife crossings, runoff management features, retaining and sound walls, landscaping, and lighting. Although the PDFs are not mitigation measures, they are included in the MMRP in order to ensure and track their implementation. The PDFs for the corridor Alternatives are described below. | | |
| PDF 2-1: Retaining Walls for the Corridor Alternatives. Retaining walls will be provided in some locations along the alignments. Retaining walls can be used to minimize or reduce the amount of grading in areas with substantial topography, or to minimize or reduce right-of-way takes in developed areas. The specific locations of retaining walls will be refined in final design. | TCA | During Final Design |
| PDF 6-1: Sound Walls for the Corridor Alternatives. Sound walls to reduce noise impacts on adjacent sensitive land uses under the corridor Alternatives will be provided consistent with FHWA, Caltrans, and local noise standards. The locations of the noise walls included in the corridor Alternatives are shown on detailed maps in Appendix K. Some of these noise walls will be outside the disturbance limits and rights-of-way for the corridor Alternatives. Those noise walls would be adjacent to existing sensitive land uses to maximize the noise reduction benefits of these walls for the adjacent sensitive uses. Those walls would be constructed on the affected property, with the permission of the property owner, and would become the property of that property owner. The disturbance limits for these walls would be limited to the area directly adjacent to the walls. The construction access to these wall locations would be from the property owner's access (driveway) from the nearest public road and not from the disturbance limits for the build Alternatives. The noise walls for the SOCTIIP build Alternatives, including walls outside the disturbance limits, are shown on the detailed maps in Appendix K. | TCA and Caltrans | During Final Design |

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| PDF 9-1: Reduction of Downstream Effects Caused By Changes in Flow. If changes in velocity or volume of runoff, the sediment load or other hydraulic changes due to encroachment, crossings, or realignment result in an increased potential for downstream effects in channels, design features to prevent adverse effects are included in the alternatives. These will include one or more of the following (or similar features):<br>• Modifications to channel lining materials (both natural and man-made), including vegetation, geotextile mats, rock, and riprap.<br>• Energy dissipation devices at culvert outlets.<br>• Smoothing the transition between culvert outlets/headwalls/wingwalls and channels to reduce turbulence and scour.<br>• Incorporating retention or detention facilities into designs to reduce peak discharges, volumes, and erosive flow. | TCA | During Final Design |
| PDF 9-2: Concentrated Flow Conveyance Systems. The TCA will implement concentrated flow conveyance systems to intercept and divert surface flows, and convey and discharge concentrated flows with a minimum of soil erosion, both on-site and off-site where applicable. Ditches, berms, dikes and swales will be used to intercept and direct surface runoff to an overside drain or stabilized watercourse. | TCA | During Final Design |
| PDF 9-3: Slope and Surface Protection Systems. The TCA will use surface protection to minimize erosion from completed, disturbed surfaces. Surface protection includes but is not limited to vegetative cover or hard surfacing such as concrete, rock, or rock and mortar. | TCA | During Final Design |
| PDF 9-4. Detention Basins. The TCA will implement EDBs on the SOCTIIP build Alternative to temporarily detain water on the site and allow sediment and particulates to settle out. EDBs will be maintained, monitored and documented per RWQCB and Caltrans requirements and conform to the guidelines set forth in the SWMP. The siting of EDBs requires that sufficient head is available such that water stored in the basin does not cause a backwater condition in the storm | TCA | During Final Design |

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|---|---|---|
| drain system, which would limit its capacity. Additionally, high groundwater must be no higher than the bottom elevation of the basin; otherwise, the basin would not drain completely. The siting process also required consideration of sensitive environmental constraints. The EDBs were sited to avoid those areas as well. | | |
| PDF 9-5. Biofiltration Swales and Strips (Vegetated Treatment Strips). The TCA will use biofiltration swales and strips, as shown in the RMP, where applicable and in association with EDBs to convey low flow. One of the primary limitations of using bioswales is that they must be used on slopes less than two percent. Due to the terrain and the design of the Alternatives there were very few locations where they could be applied. Bioswales will be maintained, monitored and documented per RWQCB and Caltrans requirements and will conform to guidelines set forth in the SWMP. | TCA | During Final Design |
| PDF 9-6. Infiltration Basins. To the extent feasible or necessary, infiltration basins will be implemented to detain runoff and infiltrate it into the soil to prevent contaminants from impairing the beneficial uses of receiving waters. Infiltration basins will be maintained, monitored and documented per RWQCB and Caltrans requirements and conform to the guidelines set forth in the SWMP | TCA | During Final Design |
| PDF 9-7: Runoff Management PDFs for the Corridor Alternatives. The build Alternatives include Best Management Practices (BMPs) to control the flow of roadway runoff and treat, to the maximum extent practicable (MEP), roadway runoff before it leaves the project site and enters existing water courses or storm drain facilities. PDFs for the SOCTIIP build Alternatives include BMPs such as extended detention basins (EDBs) and grassy swales. The disturbance and right-of-way limits for the build Alternatives, shown on the detailed maps in Appendix A, include areas for EDBs and other BMPs.<br><br>The PDFs consist of both pollution prevention BMPs and treatment BMPs. Pollution prevention BMPs are used to address design phase elements, construction, and spill mitigation. Treatment BMPs are used in the design to meet regulatory water quality requirements at specific locations. Both pollution | TCA | During Final Design |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| prevention and treatment BMPs are included in the build Alternatives to the MEP. Most of the treatment BMPs, such as EDBs, are designed with a safety factor such that they will function in conditions beyond those prescribed by Caltrans National Pollutant Discharge Elimination System (NPDES) permit. | | |
| PDF 9-8. Prior to completion of final design, TCA shall obtain approval of the hydrologic methodology and parameters to be analyzed in the Final Hydrologic Technical Report and incorporated into the Final Location Hydraulic Study from affected jurisdictional agencies. | TCA | During Final Design |
| PDF 9-9. Final design will include refinements to ensure that the bridges will be constructed to span the 100-year floodplain without raising the 100-year base floodplain water surface elevation more than 0.3 meter (1.0 foot), or otherwise causing adverse changes in the extent of the floodplain or the potential for erosion. | TCA | During Final Design |
| PDF 11-1: Bridges for Wildlife Crossings under the Corridor Alternatives. As described earlier in Section 2.5.1.5, the corridor Alternatives include bridge structures that would provide opportunities for wildlife to cross the corridor alignments. These wildlife crossings are intended to link together areas of suitable wildlife habitat that would otherwise be separated by the corridor alignments. Wildlife crossings are shown on the detailed maps in Appendix A and on Figure 4.11-6 later in this EIS/SEIR. Section 4.11 (Affected Environment, Impacts and Mitigation Measures Related to Wildlife, Fisheries and Vegetation) provides additional discussion regarding wildlife and wildlife corridors in the study area and how wildlife movements are accommodated by the bridges in the corridor Alternatives. | TCA and Project and Biologist | During Final Design |

## Mitigation Monitoring and Reporting Program for the Preferred Alternative

| Mitigation Measures | Responsible Party | Timing for Mitigation Measure |
|---|---|---|
| PDF 18-1: Lighting for the Corridor Alternatives. The corridor Alternatives will include pole-mounted lighting at the toll plazas, ramps, and other locations as required by Caltrans standards. Lighting in areas away from the toll plazas, ramps, and other locations as required by Caltrans standards will be minimized to avoid unnecessary light effects in more rural areas adjacent to the corridor. In addition, all lighting along the corridors will be shielded and directed to focus the light on the corridor and its facilities to minimize light leakage outside the corridor limits. | TCA and Caltrans | During Final Design |
| PDF 8-2: Landscaping for the Corridor. The corridor Alternatives will include landscaping for unpaved areas within the corridor rights-of-way. Landscaping will focus on native plant species, particularly in areas adjacent to undeveloped land with native plant species. In addition, the landscaping will include design components and plant materials intended to reduce the visual impacts of the corridor alternatives on adjacent sensitive uses. Section 4.18 (Affected Environment, Impacts and Mitigation Measures Related to Visual Resources) provides additional discussion of the use of native plant materials and other landscaping to soften views of the corridor. | TCA | During Final Design |
| PDF 11-2: SDG&E NCCP Operational Protocols. Utility relocation will be conducted in a manner that is consistent with the operational protocols established in SDG&E's Subregional NCCP, including measures that address general behavior for all field personnel, preactivity studies and survey work, maintenance, repair and construction of facilities, and construction and maintenance of access roads. | | |

# APPENDIX B

# RUNOFF MANAGEMENT SUMMARY/COASTAL ZONE

**Foothill Transportation Corridor – South • Orange County, CA**

# Runoff Management
# Summary of the Coastal Zone

**March 2007**

*Submitted to*

## Transportation Corridor Agencies

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Preliminary - Not For Construction, Subject to Independent Verification Prior to Final Design

# SECTION 1
# INTRODUCTION

## 1.1 BACKGROUND

The Foothill Transportation Corridor (FTC) is designated as State Route 241 (SR-241) and will connect Interstate 5 (I-5) in northern San Diego County with the southern extension of existing SR-241 in southern Orange County near Oso Parkway. The length of the proposed roadway is about 16 miles and two travel lanes in each direction will initially be constructed. The highway will be a controlled-access toll facility facilitating commuter movement between San Diego and Orange Counties. Within the coastal zone, this project will cross San Onofre Creek and San Mateo Creek in northern San Diego County.

The proposed alignment of the Foothill Transportation Corridor South (FTC-S) State Route 241 (SR-241) crosses San Mateo Creek just upstream of the existing I-5 freeway bridge crossings. To the south, the SR-241 alignment merges with I-5 at the San Onofre Creek crossing. Initial proposed improvements include the widening of the I-5 Bridge at San Onofre Creek and construction of 2 parallel flyover ramps crossing San Mateo Creek (approximately 200 feet upstream of the I-5 bridges). Figure 1 presents the proposed alignment within the watersheds. In the coastal zone, the project will also include construction of 2 extended detention basins (EDBs) and 1 bioswale for treatment of freeway storm water generated from I-5 and SR-241. Approximately 2 miles of existing I-5 will be retrofitted for storm water treatment as part of this project.

## 1.2 OBJECTIVES

This report presents the overall storm water management strategy for the project. It includes descriptions of the proposed runoff interception and conveyance systems, water pollution source control elements and water pollution treatment control facilities used to mitigate potential water resource impacts within the coastal zone.

## 1.3 REPORT ORGANIZATION

This report is separated into 8 sections beginning with the introduction followed by descriptions of the overall hydrologic and regulatory settings for the project. The report then describes the overall strategy for runoff interception/conveyance and water pollution control. This is followed by a more detailed description of water pollution source and treatment control. References are presented at the end of the document along with exhibits showing the proposed treatment best management practices (BMPs).

## 1.4 RELEVANT DOCUMENTS

The project EIR/EIS examined the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) build alternatives for various potential corridor alignments, improvement to Interstate 5 and arterial highways and a no-build alternative. The corridor alignments studied crossed portions of six regional watersheds that include portions of Orange, Riverside and San Diego Counties.

The technical studies for the EIR/EIS examined storm water runoff impacts from the pervious and impervious highway areas and slopes with respect to hydrologic, erosion and sedimentation, surface water quality and groundwater impacts.

The primary technical document supporting surface water quality for the EIR/EIS was the Runoff Management Plan, completed in December, 2003. One of the primary objectives of the RMP was to develop mitigation for the purpose of maintaining peak flow velocities downstream of the project at or below existing rates and preventing project pollutants from reaching improved and unimproved downstream drainages both during construction and subsequent operation of the Corridor.

Figure 1: Watershed Map within Project Limits

# SECTION 2
# HYDROLOGIC SETTING

## 2.1 MAJOR WATERSHEDS

The receiving waters in the vicinity of the coastal zone for this project are San Mateo Creek and San Onofre Creek which discharge into the Pacific Ocean. The Hydrologic Area (HA) within the limits of this project contributing to San Mateo Creek is San Mateo Canyon (HA 1.40). The Hydrologic Sub-Area within the limits of this project contributing to San Onofre Creek is San Onofre Valley (HSA 1.51). The approximate distances from the project's outfalls to the receiving creeks vary as follows: 1) San Mateo Creek - 0 to 650 feet and 2) San Onofre Creek – 0 to 10 feet. Figure 1 presents a detailed alignment of the project within these watersheds.

### 2.1.1 SAN ONOFRE WATERSHED

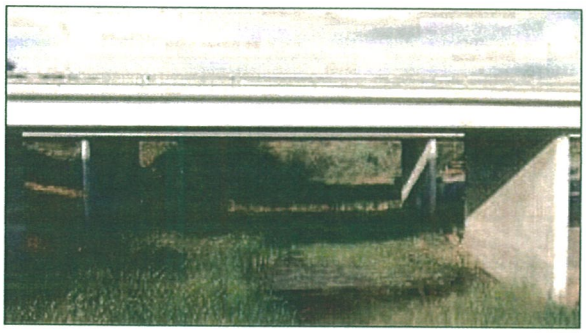

Figure 2 – Interstate-5 Bridge Structures over San Onofre Creek

The San Onofre Creek watershed covers nearly 43 square miles and is located entirely in San Diego County. It drains the east side of the Santa Margarita Mountains in the Cleveland National Forest, with the Marine Corps Base Camp Pendleton occupying nearly the entire watershed. The land use within the project watershed is largely undeveloped under Federal control (Military and Forest use), and the majority of the terrain is currently brush-covered or orchard where the MCB military training takes place. There is a little commercial and residential development within the watershed near the ocean. The watershed is mostly located within Marine Corps Base (MCB) Camp Pendleton in an unincorporated area of San Diego County, near the Orange / San Diego County boundary. There is little commercial or residential development within the watershed. The watershed area is under Federal control, designated as military use. The mouth of the creek is located at the Pacific Ocean, approximately 900 ft south of I-5. Here, a temporary pond is formed by the deposit of beach sand. During major storm events, the sand mounds are overtopped and washed away. SR-241 connects to I-5 at the San Onofre Creek crossing. Upstream, the creek turns right sharply and crosses Beach Club Road as a low-flow crossing. Upstream of the crossing, a significant amount of coarse material has settled and the natural channel is characterized by medium dense vegetation with a much wider flood plain.

### 2.1.2 SAN MATEO WATERSHED

Figure 3 – Interstate-5 Bridge Structures over San Mateo Creek

The San Mateo Creek in the vicinity of the project is located within the Marine Corps Base – Camp Pendleton. The creek consists mostly of alluvial terraces with a wide braided channel and a floodplain up to 850 feet wide. Downstream of the existing I-5 bridges, the floodplain is open space with a blind estuary/lagoon protected from the Pacific Ocean by a sandbar located at the mouth of the San Mateo Creek. The estuary contains dense wetland vegetation and is breached only after heavy storms. The lagoon extends upstream from Trestles beach approximately 1,800 ft. The vegetation within the channel upstream of the lagoon is medium to dense brush with some trees. Upstream of the existing I-5 Bridges vegetation in the main channel is medium to dense brush with some medium to tall trees. In the floodplain upstream of I-5 and south of San Mateo Creek, vegetation consists largely of agricultural fields previously leased from Camp Pendleton Marine Corps Base. Many of these fields have been fallow, resulting in coverage of low-lying brush and grasses. The San Mateo Creek watershed covers approximately 133 square miles in Orange, Riverside, and San Diego Counties. The proposed San Mateo Bridge is located in San Diego County. The watershed drains the southern side of the Santa Ana Mountains and the eastern side of the Elsinore Mountains. Approximately 14 percent of the watershed is located in Orange County, and the remainder of the watershed area is located in Riverside County (50 percent) and San Diego County (36 percent).

## 2.2 HYDROLOGIC CHARACTERISTICS

The project site has Mediterranean-type climate characterized by long, dry summers and mild winters. The average annual precipitation is approximately 13 inches and increase to 18 inches in the higher elevations. Most of the precipitation occurs during the period from November through March, with little or no rainfall from May through October. Three types of storms produce precipitation in the area: general winter storms, thunderstorms, and tropical cyclones. Flooding is most often caused by high intensity rainfall associated with general winter storms. Flooding can rise from a dry stream bed to flood stage in a matter of hours.

Soil groups within the project area have been mapped and classified according to criteria set forth by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS, formerly known as the Soil Conservation Survey). Based

upon these criteria, soils are further classified into four hydrological soil groups: A, B, C, and D, where A is the most pervious with low runoff potential (such as sand and gravel), and D is the least pervious with high runoff potential (such as clay soils). Project area soils within the coastal zone include types B, C and D with type B generally following the alluvial deposits along the creeks and types C and D generally located along the hillsides.

The land within the project watershed is largely undeveloped, and the majority of the terrain is currently brush-covered or agricultural. Most of the land in the project watershed is designated as "open space".

## 2.3 FLOOD PLAINS

The flood plains within the project area coastal zone include those associated with San Onofre Creek and San Mateo Creek. In general, the project would result in a minor increase in impervious surface in the watersheds for these creeks. This can be expected to translate into minor localized increases in runoff. However, lag time between the peak runoff of these major streams and that from the freeway runoff is large, i.e. the peak flow from the freeway will have substantially subsided by the time the watershed peak occurs. This, coupled with the minor increase in impervious surface (approximately 0.2 percent of the San Mateo Creek watershed and less than 0.1 percent of the San Onofre Creek watershed), results in an insignificant increase in peak flows found in San Onofre and San Mateo Creeks. The following provides a description of the floodplains along with existing and proposed bridge structures traversing the floodplains.

### 2.3.1 SAN ONOFRE FLOOD PLAIN

The existing San Onofre Creek crossing at I-5 consists of two separate structures (left and right) carrying southbound (SB) and northbound (NB) traffic. The floodplain in this vicinity extends over the main stream channel and is contained within the high channel banks and bridge abutments. The flood flow depths and velocities range from 13.0 - 14.4 feet and 4.0 - 6.3 feet per second, respectively. Each existing structure consists of a 4-span concrete box girder bridge supported by 2 abutments and 3 piers and are 354 ft long and 68 ft wide, crossing the creek at a skew angle of 10 degrees. The foundation system consists of driven steel piles. Pier walls are 2-ft thick and aligned with the direction of creek flow. The embankment fills at abutments vary from 30 to 40-ft in height.

Proposed improvements consist of widening the existing structure on both the upstream (NB) side (42.5 ft to 52.0 ft) and on the downstream (SB) side (37.0 ft to 52.7 ft). The widened structure would be constructed on pier walls similar to the existing structure, with the same 2-ft width as the existing pier walls. The proposed widening creates an increase in water surface of 0.6 ft at the upstream face of the proposed bridge widening. The increase diminishes to 0 approximately 66 ft upstream of the bridge. Therefore, the water surface impacts are considered minor and within the Federal Emergency Management Administration (FEMA) guidelines.

### 2.3.2 SAN MATEO FLOOD PLAIN

The existing San Mateo Creek crossing of I-5 consists of two parallel 5-span reinforced concrete box girder bridges supported on pile-supported reinforced concrete pier walls. The northbound and southbound structures are symmetrical. The floodplain in this vicinity extends over the main stream channel and is contained within the high channel banks and bridge abutments. In general, the floodplain is wide upstream and downstream of the I-5 bridge structures and contracts at the bridge crossings. Flood flow depths in the creek range from 14.8 – 16.2 ft, and flow velocities range from 12 - 14 feet per second (fps). Each existing structure is 500 ft long and 68 ft wide. The 4 pier walls are 50 ft tall, 2 ft thick and supported with a pile cap and piles. Each footing is 16 ft wide and approximately 69 ft long, supported by a foundation constructed of twelve 3-ft diameter cast-in-drilled-hole (CIDH) piles.

Improvements include construction of two connector bridges to SR-241 over San Mateo Creek, upstream of the I-5 bridge structures. The northbound connector is a 3,860 ft long cast-in-place pre-stressed concrete box girder bridge. It will be supported by 15 single column piers between the abutments. The pier spacing is approximately 250 ft on average through the Creek. The bridge crosses San Mateo Creek at a skew angle ranging from 45 degrees at the creek crossing to approximately 70 degrees near the north abutment. Piers 2 through 11 will be within the ineffective flooded area of the creek. Piers 12 through 16 will be within the San Mateo Creek floodway. The southbound connector is a 3,911 ft long cast-in-place pre-stressed concrete box girder bridge. It is supported by 12 single column piers and two outriggers between the abutments. The piers are spaced approximately 270 ft on average through the Creek. The bridge crosses San Mateo Creek at a skew angle ranging from 60 degrees at the creek crossing centerline to approximately 70 degrees near the north abutment. Only Piers 11 through 15 will be within the floodway. Piers 2 through 10 will be located in the ineffective flow area of the stream. In the vicinity of the proposed bridge crossings, the flow depths in the main channel range from 15.6 - 16.8 ft. Flow velocities range from 12 - 14 fps. The proposed bridges will result in a maximum increase in water surface elevation of 0.4 ft upstream of the existing I-5 bridge structures. The increase in water surface elevation diminishes to zero approximately 0.75 mi upstream of the bridge structures. Therefore, the water surface impacts are relatively minor.

# SECTION 3
# REGULATORY SETTING

## 3.1 REGIONAL WATER QUALITY CONTROL BOARD

The proposed project is located within the jurisdiction of the San Diego Regional Water Quality Control Board (RWQCB). Regulations for discharges within this area are included in the Water Quality Control Plan for the San Diego Basin (September 1994). Section 401 of the Clean Water Act is administered locally by the San Diego RWQCB. This stipulates that any action that requires a federal license or permit and that may result in a discharge of pollutants into waters of the U.S. also requires water quality certification. It is designed to ensure that the discharge will comply with applicable federal and state effluent limitations and water quality standards. Waters of the U.S. within the coastal zone for this project include San Onofre and San Mateo Creeks. Section 402(p) of the Water Quality Protection Act of 1987 requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for construction projects that disturb more than 1 acre of land as part of the National Pollution Discharge Elimination System (NPDES). In California, the State Water Resources Control Board (SWRCB) is responsible for implementing this requirement through the RWQCB and Caltrans.

## 3.2 CALIFORNIA STATE DEPARTMENT OF FISH AND GAME

Section 1602 of the California State Department of Fish and Game Code requires a Streambed Alteration Agreement for any alteration to the bank or bed of a stream or lake. Streams within the coastal zone include San Onofre Creek and San Mateo Creek.

## 3.3 U.S. ARMY CORPS OF ENGINEERS

Section 404 of the Clean Water Act requires a "Section 404 Permit" for the discharge of dredged or fill material into all waters of the U.S. This permit is administered by the United States Army Corps of Engineers. Waters of the U.S. within the coastal zone for this project include San Onofre and San Mateo Creeks.

## 3.4 FEDERAL EMERGENCY MANAGEMENT ADMINISTRATION

The Federal Emergency Management Administration (FEMA) is responsible for oversight of floodplain impacts. A Floodplain Evaluation is required as described under the National Flood Insurance Program (23 CFR 650, Subpart A Section 650) for project work within the 100-year floodplain. Section 650.111 of the regulations calls for location hydraulic studies to be performed with detailed engineering design drawings. Hydraulic modeling is required along with a hydraulic report summarizing the results (to be submitted for review by the local agencies listed in the FEMA Flood Insurance Rate Maps [FIRMs]). A Conditional Letter of Map Revision (CLOMR) and a Letter of Map Revision (LOMR) may be required by FEMA for work within a floodway or for work resulting in significant impacts to the floodplain.

# SECTION 4
# RUNOFF INTERCEPTION AND CONVEYANCE STRATEGY

## 4.1 OVERALL CONCEPT

Major drainage design concepts in this project are described below. Where feasible, the drainage design will:

- Maintain existing drainage flow patterns and incorporate existing drainage systems as much as possible, given existing physical constraints,
- Avoid drainage facilities which are incompatible with conceptual design of build-out phase drainage systems,
- Be sized for build-out phase flows and include build-out phase facilities, to the extent feasible, in order to minimize throwaway costs during build-out phase construction,
- Keep separate offsite and cut/fill slope runoff from pavement runoff by placement of dike along the edge of shoulder and collecting with storm drains as needed,
- Provide Treatment Best Management Practices (BMPs) to treat all highway runoff to the Maximum Extent Practicable (MEP) objectives set forth by Caltrans before discharging to natural channels, and
- Provide flow-splitting structures in onsite storm drains which will pass water quality flows to treatment BMPs and reduce the potential for diversions between tributaries that results from collection of water quality flows by the on-site storm drains.

The following sections describe existing and proposed drainage conditions along the project alignment for on-site and off-site systems separately.

## 4.2 ON-SITE RUNOFF

### 4.2.1 EXISTING ON-SITE DRAINAGE CONDITIONS

I-5 and Connectors

Current on-site drainage along I-5 in this area consist of a series of storm drains and inlets that outlet to longitudinal surface ditches draining directly to San Onofre and San Mateo Creeks without storm water treatment. Along I-5, Basilone Road marks the drainage area boundary between the storm drainage system that conveys flow southward to San Onofre Creek and the storm drainage system that conveys flow northward to San Mateo Creek.

SR-241 and Cristianitos Road

Along the existing Cristianitos road, east of I-5, pavement drainage flows via sheet flow and overside drains to the adjacent hillside (north bank of San Mateo Creek). This runoff currently has no storm water pollution control facilities associated with it.

### 4.2.2 PROPOSED ON-SITE DRAINAGE CONDITIONS

I-5 and Connectors

On-site drainage along I-5 from the north side of San Mateo Creek southward 2-miles will be retrofitted to provide stormwater treatment to on-site runoff. This will be accomplished by constructing storm drain systems along I-5 and along the proposed SR-241/I-5 connectors that will tie into the existing storm drains. The storm drain improvements will convey storm water to extended detention basins adjacent to San Onofre and San Mateo Creeks.

The proposed on-site storm drain network along I-5 and along the SR-241 connectors consists of 2 systems which convey storm water to extended detention basins adjacent to San Onofre Creek (system 1) and San Mateo Creek (system 2). System 1 includes a storm drain system along I-5 from Basilone Road southward for approximately 1.5 miles. The system will convey flows to the east side of I-5 where it will connect to a 3.7 acre-ft extended detention basin (located at the south embankment of San Onofre Creek) for storm water treatment. The detention basin will outlet into a pipeline routing the treated runoff to San Onofre Creek. For erosion control, the outlet will consist of a 100 square foot rip rap energy dissipater located on the south embankment of San Onofre Creek.

The proposed on-site system 2 includes a storm drain system along I-5 from Basilone Road northward to San Mateo Creek. This system will convey flows to the east side of I-5 where it will connect to a 2.5 acre-ft extended detention basin (located on the south side of San Mateo Creek) for storm water treatment. The detention basin will outlet into a pipeline routing the treated runoff to San Mateo Creek. For erosion control, the outlet will consist of a 100 square foot rip rap energy dissipater located on the south embankment of San Mateo Creek. System 2 will also include storm drains provided at the toe of embankment along the east side of I-5 to convey storm flow from the above-grade SR-241 Connector structures. Deck drainage from these bridges will be routed down columns, outleting to the system 2 storm drains. All system 2 storm drains will connect to the EDB prior to discharge into San Mateo Creek.

SR-241 and Cristianitos Road

On-site runoff for the area north of San Mateo Creek, at the Cristianitos Rd crossing will be conveyed to treatment BMPs via storm drain systems equipped with flow splitters that capture and convey water quality flows to the BMPs and allow peak flows to continue on their original flow path. In this way, the on-site pre-treated low flows and off-site flows are always separated. Treatment BMPs in this vicinity include a detention basin and a biofiltration swale. Once treated, the on-site runoff is directed to an off-site storm drain system that conveys the flow along the freeway to San Mateo Creek at the existing I-5 bridge. This system is designated as system 3.

Two on-site storm drain systems (systems 4 and 5) intercept and convey the on-site runoff in this area. System 4 includes a series of pipelines that direct flow from the

shoulders into the median where a 1700-ft long biofiltration swale will treat the runoff. The swale then conveys the runoff to offsite system 3 (ultimately outleting to San Mateo Creek). System 5 includes a storm drain system that intercepts and conveys on-site runoff to a 1 acre-ft EDB located 2500 ft north of the San Mateo Creek crossing. This system is equipped with flow splitters that convey water quality flows to the EDB which then outlets to off-site system 3.

## 4.3 OFF-SITE RUNOFF

### 4.3.1 EXISTING OFF-SITE DRAINAGE CONDITIONS

I-5 and Connectors

Offsite drainage consists of cross-drainage where runoff generated uphill or upstream of the roadway is passed under the roadway. The regional drainage consists of bridges that convey surface water and stream flow under the roadway. The bridges are designed to pass the 100-year flood (1% probability). Along I-5, off-site drainage crosses the freeway under the San Onofre and San Mateo Creek bridge structures.

The existing San Onofre Creek is a relatively narrow natural channel vegetated with low lying shrubs and grasses. The watershed area for this stream is 43 square miles and the 100-year flow rate is estimated at 16,700 cfs. Flood flow at this location extends over the 240-ft wide main stream channel, contained within the high channel banks and bridge abutments of the I-5 crossing. Flood flow depths and velocities range from 13.0 - 14.4 feet and 4.0 - 6.3 feet per second, respectively. Each existing structure consists of a 4-span concrete box girder bridge supported by 2 abutments and 3 piers and are 354 ft long and 68 ft wide, crossing the creek at a skew angle of 10 degrees.

The existing San Mateo Creek is a natural channel with a very wide floodplain upstream of I-5 which narrows at the I-5 crossing. The watershed area for this stream is 133 square miles and the 100-year flow rate is estimated at 40,300 cfs. The crossing at I-5 consists of two parallel 5-span reinforced concrete box girder bridges supported on pile-supported reinforced concrete pier walls. The northbound and southbound structures are symmetrical. Flood flow extends over the 320-ft wide main stream channel and is contained within the high channel banks and bridge abutments. Flood flow depths in the creek range from 14.8 – 16.2 ft, and flow velocities range from 12 - 14 feet per second (fps). Each existing structure is 500 ft long and 68 ft wide. The 4 pier walls are 50 ft tall, 2 ft thick and supported with a pile cap and piles. Each footing is 16 ft wide and approximately 69 ft long, supported by a foundation constructed of twelve 3-ft diameter cast-in-drilled-hole (CIDH) piles.

SR-241 and Cristianitos Road

Storm water runoff north of San Mateo Creek (at the proposed alignment of SR-241 and Cristianitos Road) sheet flows southward into the stream. Erosion over time has produced hillsides streams and gullies that collect and concentrate the flow in some

areas. This area is located within the downstream end of the San Mateo Creek watershed.

### 4.3.2 PROPOSED OFF-SITE DRAINAGE CONDITIONS

I-5 and Connectors

Proposed improvements at San Onofre Creek consist of widening the existing bridge structure on both the upstream (NB) side (42.5 ft to 52.0 ft) and on the downstream (SB) side (37.0 ft to 52.7 ft) of I-5. The widened structure would be constructed on pier walls similar to the existing structure, with the same 2-ft width as the existing pier walls. The proposed widening creates an increase in water surface of 0.6 ft at the upstream face of the proposed bridge widening. The increase diminishes to 0 approximately 66 ft upstream of the bridge.

Proposed improvements at San Mateo Creek include construction of two connector bridges to SR-241 over San Mateo Creek, upstream of the I-5 bridge structures. The northbound connector is a 3,860 ft long cast-in-place pre-stressed concrete box girder bridge supported by 15 single column piers between the abutments with 5 piers located within the main channel. The bridge crosses San Mateo Creek at a skew angle ranging from 45 degrees at the creek crossing to approximately 70 degrees near the north abutment. The southbound connector is a 3,911 ft long cast-in-place pre-stressed concrete box girder bridge supported by 12 single column piers and two outriggers between the abutments (5 piers will be located within the main channel). The bridge crosses San Mateo Creek at a skew angle ranging from 60 degrees at the creek crossing centerline to approximately 70 degrees near the north abutment. The proposed bridges will result in a maximum increase in water surface elevation of 0.4 ft upstream of the I-5 bridge structure, diminishing to zero approximately 0.75 mi upstream of the proposed bridge structures.

SR-241 and Cristianitos Road

The proposed off-site system will consist of culverts and longitudinal ditches that intercept and convey surface water generated uphill of SR-241 under the roadway to existing water courses. The culverts are designed to pass the 10-year flood without causing the headwater elevation to rise above the inlet top of culvert and to pass the 100-year flood without causing objectionable backwater depths, outlet velocities, or ponded water outside the right-of-way. One 36-inch cross-culvert is proposed where a major flow path is located along the hillside approximately 5000 ft north of the San Mateo Creek crossing. South of this location, off-site runoff consists mainly of sheet flow which is intercepted and conveyed through a storm drain system (designated as system 3) to a rip rap lined section of San Mateo Creek located immediately north of I-5 (see Figure 4).

Figure 4: Rock Slope Protection along North Embankment of San Mateo Creek at I-5 Crossing

# SECTION 5
# WATER POLLUTION CONTROL STRATEGY

## 5.1 CONSTRUCTION

The project owner is required to obtain coverage under the Construction General Permit for discharge of storm water from a construction activity prior to the start of construction of the project. A Storm Water Pollution Prevention Plan (SWPPP) will be prepared once final design documents are available. The selection of construction Best Management Practices (BMPs) will be determined as a part of the development of the SWPPP; however the project EIR/EIS and supporting documents describe the following general construction BMPs for the project:

- Source identification and control (through covering and containing) of potential pollutants
- Erosion control techniques for temporary, permanent and wind conditions. Types of erosion control to be considered include rolled erosion control products (RECPs) and hydraulically applied mulches.
- Sediment control techniques with the specific objective of maintaining sediment loads consistent with pre-construction levels. Types of sediment control BMPs to be considered include fiber rolls, silt fence, drainage inlet protection and sediment traps and basins.
- Control of non-storm water through elimination of sources.

In addition, the SWPPP will include a storm water runoff sampling plan to ensure that BMPs are functioning effectively during construction.

## 5.2 POST-CONSTRUCTION

The post-construction storm water program for was developed based on the Caltrans Statewide Storm Water Quality Practice Guidelines (CTSW-RT-02-009).

### 5.2.1 POLLUTION PREVENTION

The overall surface water quality program was designed to incorporate pollution prevention and source control BMPs in association with treatment control BMPs. A variety of pollution prevention BMPs were included in the planning phases of the project development. The following pollution prevention BMPs were described in the EIR/EIS and supporting technical documents:

- Minimize impervious surfaces
- Stabilize disturbed soil areas
- Maximize vegetated surfaces
- Preserve existing vegetation
- Construct concentrated flow conveyance systems
- Outlet protection (energy dissipation)

Pollution prevention BMPs were considered in the final selection of the Corridor alignment, the selection of the Corridor roadway cross section, and in the development of the concept grading plan. Further, the project will include demarcation of the limit of disturbed soil area during construction to ensure that adjacent vegetation is preserved.

### 5.2.2 POLLUTANT REMOVAL

The selection of treatment BMPs was based on the Caltrans Storm Water Management Plan (SWMP, August 2001) and the Caltrans Project Planning and Design Guide (PPDG, 2003 and 2005). The Caltrans SWMP included specific analysis regarding BMPs for targeted design constituents (TDCs) for highway runoff as well as specialized recommendations for maintenance of approved BMPs.

A project must consider treatment for a TDC when an affected water body within the project limits is on the 303(d) list of impaired water bodies for one or more of the 303(d) listed constituents. There are 10 design constituents per the PPDG. The 303(d) list for the project receiving waters in the coastal zone (San Mateo Creek and San Onofre Creek) shows no impairment. Therefore, Caltrans general purpose pollutant removal was used for BMP design. The Caltrans-approved treatment BMPs considered for implementation on the project were:

- Biofiltration swales (BSWs)
- Biofiltration strips
- Extended detention basins (EDBs)
- Infiltration basins
- Media filters
- Multi-chambered Treatment Trains (MCTTs)
- Wet Basins
- Dry weather flow diversions
- Gross solids removal devices (GSRDs)

Each of these measures is evaluated individually for implementation on the proposed project in accordance with the guidelines provided in the PPDG. A description of the evaluation performed for each of these treatment BMPs and associated design criteria for those that are implemented is provided below.

Biofiltration Swales/Strips. Biofiltration swales are vegetated channels that receive directed flow and convey stormwater. Pollutants are removed by filtration through the grass, sedimentation, adsorption to soil particles, and infiltration into the soil. They are mainly effective at removing debris and solid particles, although some dissolved constituents are removed by adsorption onto the soil. These BMPs are most applicable in areas where site conditions and climate allow for the establishment of vegetation, where flow velocities are low, and where the length of flow through the swales can be maximized. Swales were considered at locations along the alignments where longitudinal slopes were consistent with design criteria

and where right-of-way requirements would not conflict with other environmental mitigation. Much of the Corridor alignment is at longitudinal grades exceeding about 3% due to the local topography. As a result, swales were not considered technically feasible in many locations. Further, swales require additional right-of-way as compared to an underground drainage system. In areas with sensitive vegetation or habitat (such as coastal sage scrub), swales were not considered feasible if their use also required additional mitigation of vegetation or habitat due to additional right-of-way requirements.

Biofiltration strips are generally used in association with vegetated swales and convey roadway runoff from the edge of pavement, across a vegetated buffer strip. The same constraints associated with vegetated swales (roadway slopes and additional encroachment into sensitive areas) also restricted the use of this BMP along the Corridor alignments studied.

Extended Detention Basins (EDBs). A detention basin (EDB) is a permanent device that temporarily detains stormwater runoff under quiescent conditions such that sediment and particulates are able to settle before the runoff is discharged. EDBs were selected by the feasibility analysis in the project EIR/EIS and supporting technical documents as the best BMP for implementation as a part of the project. EDBs were determined to be effective in mitigating the TDCs and the siting and design constraints for this device could be accommodated. The EDBs were sized based on the water quality volume (WQV) resulting from 0.8 inches of rainfall. The WQV is estimated using the precipitation depth times the tributary drainage area and the runoff coefficient. The water quality depth is an approximate depth for the Orange County area as specified in the Runoff Management Plan Technical Report (Psomas, 2003) and as determined using the Basin Sizer program (CSUS, 2001).

Infiltration Basins. An infiltration basin is a device designed to remove pollutants from surface discharges by capturing stormwater runoff and infiltrating it directly into the soil rather than discharging to receiving waters. Infiltration basins are a good choice for surface water protection where there are soils that support their use. Most of the Corridor alignments studied were located in upland areas away from streams and stream courses. The soil material underlying most of the alignments is primarily siltstone, with associated low permeability that does not support the use of infiltration basins. The few locations that exhibit adequate infiltration/permeability characteristics are in the alluvial basins, on the banks of the streams where the water table is too high to support adequate infiltration.

Media Filters: Media filters primarily remove TSS pollutants (sediments and metals) from runoff by sedimentation and filtration and also are effective for removing dissolved metals and litter. An "Austin" sand filter typically has an open top, is designed at grade, and has no permanent water pool. A "Delaware" sand filter is always configured with closed chambers, is designed below grade, and has a permanent pool of water which is a concern regarding vector control. An "Austin" filter may be configured with earthen sides and invert but usually has chambers made of concrete while a "Delaware" sand filter is always designed with concrete

sides and invert. Media Filters also need sufficient hydraulic head to operate by gravity (3 to 6 ft). Delaware style media filters are suitable for relatively small drainage areas where surface use over the filter is required. Treatment drainage areas are relatively large on the project making Delaware filters considerably more costly than Austin style filters, consequently, their use was not considered for this project. Austin style media filters are technically feasible for this project, however, they require additional right of way as compared to EDBs and bioswales. The locations where the treatment BMPs are to be constructed are right-of-way constrained. Consequently, media filters are not technically and economically feasible for this project.

Multi-Chambered Treatment Train (MCTT). The MCTT is a storm water treatment device that uses different treatment mechanisms in each of three separate chambers. Multi-Chambered Treatment Trains are suitable for relatively small drainage areas where treatment of toxicity is indicated. MCTTs were not considered for this project due to the relatively large tributary areas and the lack of an identified need to treat toxicity in the runoff.

Wet Basins. A wet basin is a detention system comprised of a permanent pool of water, a temporary storage volume above the permanent pool, and a shoreline zone planted with aquatic vegetation. Wet basins are typically placed where wetlands do not exist. A wet basin design requires a permanent source of water for a permanent pool. The project site does not have a permanent source of water to maintain a permanent pool and vegetation. A pool could also cause problems with vector control. A wet basin was therefore not proposed for the project.

Dry Weather Diversions. There is no anticipated source of dry weather flow within the project. Areas of the project that include irrigation (at toll plazas and interchanges only) will include provisions to ensure that over-irrigation does not occur.

Gross Solids Removal Devices (GSRDs). GSRDs remove gross solids (defined as a particle about 5mm square or larger) and are specifically targeted for trash and debris. GSRDs were not selected for use on the project because the selected BMPs effectively remove gross solids.

# SECTION 6
# POLLUTION SOURCE CONTROL

## 6.1 REDUCTION OF IMPACTS FROM FLOW CHANGES

In general, the project would result in a minor increase in impervious surface in the watersheds for these creeks which can be expected to translate into minor localized increases in runoff. However, lag time between the peak runoff of these major streams and that from the freeway runoff is large, i.e. the peak flow from the freeway will have substantially subsided by the time the watershed peak occurs. This, coupled with the minor increase in impervious surface (approximately 0.2 percent of the San Mateo Creek watershed and less than 0.1 percent of the San Onofre Creek watershed), results in an insignificant increase in peak flows found in San Onofre and San Mateo Creeks. In order to mimic pre-project flows, inlet flow splitters have been incorporated into the design of the long storm drain systems. The flow splitters capture and convey water quality flows to extended detention basins and allow peak flows to continue on their original flow path.

## 6.2 PRESERVATION OF EXISTING VEGETATION

Existing desirable vegetation and landscaping will be protected in place, where possible and will be shown on plan. The project will include demarcation of the limit of disturbed soil area during construction to ensure that adjacent vegetation is preserved.

## 6.3 CONCENTRATED FLOW CONVEYANCE SYSTEMS

Risks due to erosion or washout will be minimized through the use of rock slope protection, hydroseeding, ground cover, mulch, longitudinal ditches and down drains. Velocity dissipation devices, flared end outlets, headwalls, transition structures, and splash walls will be incorporated into the design where necessary at culvert inlets and outlets to prevent erosion. Lined longitudinal ditches will be incorporated at the uphill side of SR-241 to intercept sheet flow where necessary and to convey it to culverts or bridges that cross under the roadway. Culvert outlets will be equipped with appropriate energy dissipating devices.

## 6.4 SLOPE AND SURFACE PROTECTION SYSTEMS

Various slope and surface protection measures will be used to address site soil stabilization and reduce deposition of sediments in the adjacent surface waters. Typical measures include the application of soil stabilizers such as hydroseeding, rock slope protection, velocity dissipation devices, flared end sections for culverts and others. The project will be constructed to minimize erosion by incorporating retaining walls to reduce the steepness of slopes or to shorten slopes; providing cut and fill slopes flat enough to allow re-vegetation and limit erosion to pre-construction rates; and by collecting concentrated flows in stabilized drains and channels. Energy dissipaters in the form of rip rap, impact basins or velocity control rings will be provided at storm drain outlets to control erosion. Riprap sizes and thicknesses will be shown on the plans and stone gradation/ placement methods will be defined in the specifications.

# SECTION 7
# POLLUTION TREATMENT CONTROL

## 7.1 REQUIREMENTS

Best Management Practices (BMPs) will be designed and implemented to reduce the discharge of pollutants from the on-site storm drain system for all of the SR-241 freeway runoff and 2 miles of I-5 tributary to San Onofre and San Mateo Creeks where no BMPs are in place. Treatment BMPs considered feasible and practicable for the project include extended detention basins (EDBs) and biofiltration swales as described in Section 5. Incorporation of these BMPs into the on-site drainage system will result in an improvement in water quality from I-5 runoff before it enters into the receiving water bodies. Constraints evaluated during BMP design included: 1) land use (e.g. impacts on culturally and biologically sensitive sites were minimized), 2) storm drain conveyance viability (e.g. collection, conveyance and treatment of bridge runoff required detailed analysis), 3) narrow corridor constraints (e.g. locating EDBs along hillsides with maintenance access required detailed grading), and 4) outlet locations (outleting directly to major streams minimizes potential erosion on hillsides). On-site drainage from I-5 from San Mateo Creek southward 2-miles will be retrofitted to treat on-site runoff. All of the proposed SR-241 on-site runoff will also be treated.

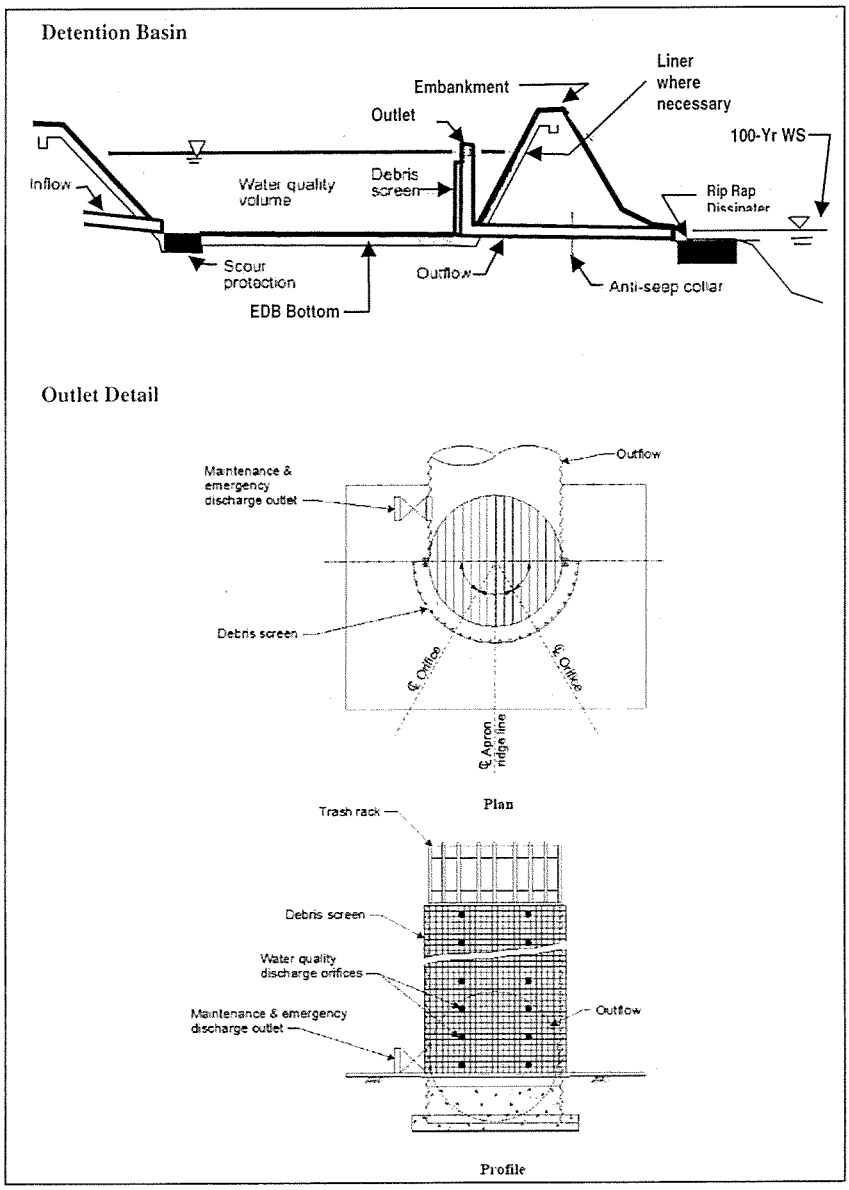


Figure 5: Proposed EDB Design Details

## 7.2 EDB DESIGN

Extended detention basins (EDBs) are impoundments where the water quality volume resulting from 0.8 inches of rainfall is temporarily detained under calm conditions, allowing sediment and particulates to settle out. Detention

basins collect litter, settleable solids (debris), total suspended solids (TSS) and pollutants which are attached (absorbed) to the settled particulate matter. Vegetated low-flow channels within the basins serve as oil and grease traps, providing additional pollutant removal. All EDBs will be designed per Caltrans standards and will be accessible for maintenance with 12-ft wide access roads designed with adequate turnaround for maintenance vehicles. The maximum access road grade will not exceed 18% and grades greater than 9% shall be paved. The inverts and sides will be vegetated with a plant mix approved by the Caltrans landscape architect. Liners will be required where groundwater levels are less than 10-ft from the bottom of the basin. Historic groundwater levels of monitoring wells located adjacent to the proposed San Onofre and San Mateo EDB sites indicate that groundwater may rise to within 8-ft and 5-ft from the basin inverts for the 2 basins, respectively (Stetson, 2005). Figure 5 shows typical design details for the EDBs.

Two EDBs are proposed for the area within the coastal zone limits. These include one adjacent to San Onofre Creek and one adjacent to San Mateo Creek. The runoff area tributary to the San Onofre Creek EDB is 62 acres which includes those sections of I-5 and SR-241 from Basilone Road to the south (see Exhibits BMP-01 and BMP-02 in Appendix A). The runoff area tributary to the San Mateo Creek EDB is 41 acres which includes those sections of I-5 and SR-241 from the San Mateo Creek crossings southward to Basilone Road (see Exhibits BMP-02 and BMP-03 in Appendix A). The water quality volumes are 3.7 acre-ft and 2.5 acre-ft for the San Onofre Creek EDB and San Mateo Creek EDB, respectively.

## 7.3 SWALE DESIGN

Biofiltration swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of stormwater runoff.

Swales were considered at locations along the alignment where longitudinal slopes do not exceed 2 percent and where right-of-way requirements would not conflict with other environmental mitigation. Much of the Corridor alignment is at longitudinal grades exceeding about 3% due to the local topography. As a result, biofiltration swales were not considered technically feasible in many locations. Within the limits of the coastal zone, one swale is proposed. It will be located immediately north of the SR-241 crossing of San Mateo Creek (see Exhibit BMP-03 in Appendix A). Here, the vegetated trapezoidal swale shall be located in the median of SR-241 at a slope of less than 2- percent, with 4:1 side slopes and a length of 1700 ft. The swale will be designed to Caltrans standards which requires water quality flow velocities (equal to the flow generated from the 85$^{th}$ percentile storm) to be low enough to keep hydraulic residence times in the swale greater than 5-minutes. The swale will be vegetated with native grasses and will treat runoff from SR-241 for the area north of San Mateo Creek from the connector structures to the Cristianitos Road crossing. The downstream end of the swale shall connect to a grated inlet structure which outlets to an adjacent off-site storm drain system (that ultimately conveys the treated flow to the north bank of San Mateo Creek.

# SECTION 8
# REFERENCES


California Department of Transportation. Project Planning and Design Guide. July, 2005.

California Department of Transportation. Storm Water Management Plan. August, 2001.

California Department of Transportation. Storm Water Quality Handbooks. March, 2003.

Federal Emergency Management Agency (FEMA). Flood Insurance Study for Orange County. California and Unincorporated Areas. September 15, 1989.

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Stetson Engineers. Three-Dimensional Groundwater Flow Model of the San Mateo and San Onofre Basins – USMC Base Camp Pendleton. February, 2005.

U.S. Army Corps of Engineers, Draft Environmental Impact Statement for San Juan Creek and Western San Mateo Creek Watershed, Special Area Management Plan. November 2005.

USEPA, 2002 Clean Water Act Section 303(d) List of Waters Quality Limited Segments-San Diego Regional Water Quality Control Board. July 2003.

# APPENDIX A
# BMP EXHIBITS

NOTE: FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE

| DIST | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 11 | SD | 241 | 0.0/1.3 | 22 | |

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — NAME — NO. — EXP. DATE — CIVIL — STATE OF CALIFORNIA

FOOTHILL/EASTERN TRANSPORTATION CORRIDOR AGENCY
125 PACIFICA SUITE 100
IRVINE, CA. 92618

PARSONS TRANSPORTATION GROUP
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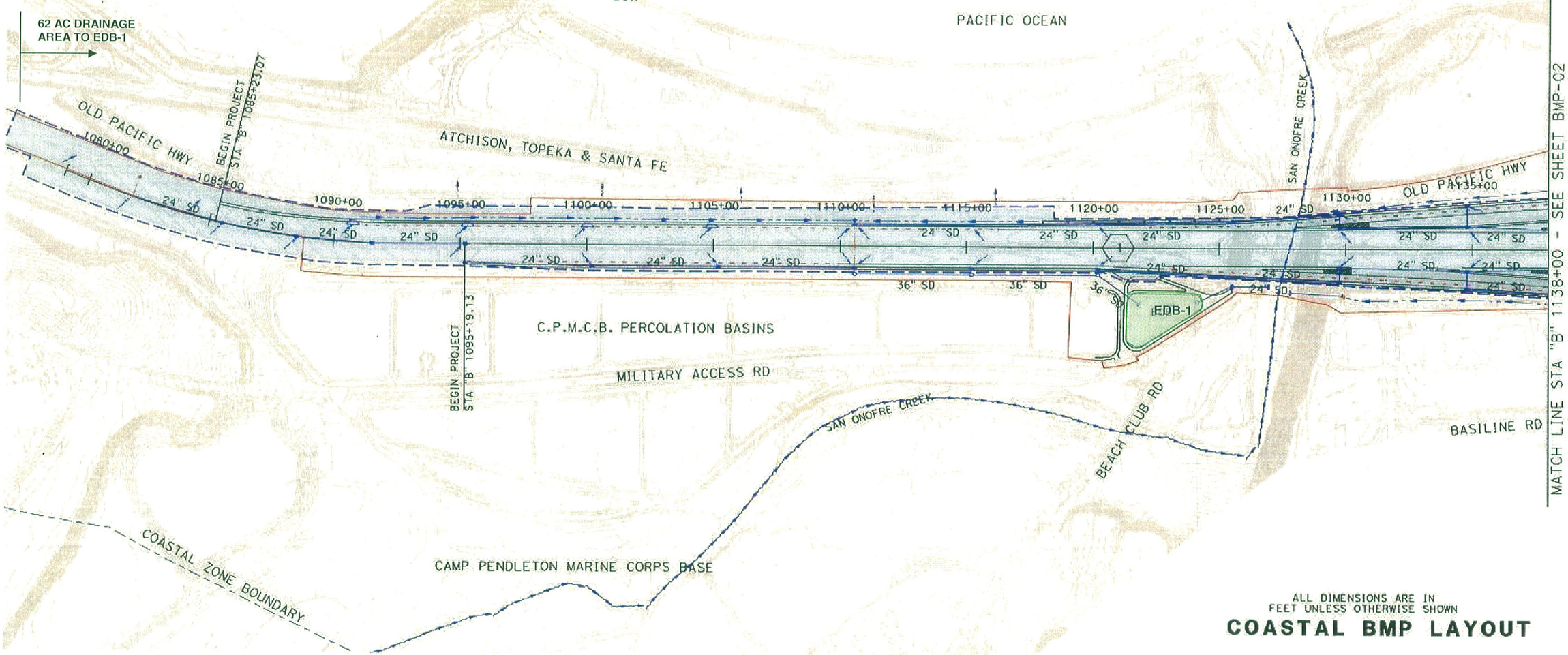
## LEGEND

- FLOW DIRECTION
- DRAINAGE AREA TO BMP
- 24" SD — PROPOSED STORM DRAIN
- PROPOSED JUNCTION STRUCTURE
- PROPOSED CATCH BASIN
- EXISTING STORM DRAIN
- EDB — EXTENDED DETENTION BASIN
- DISTURBANCE LIMITS
- AC SPILLWAY
- DRAINAGE DITCH
- PIPE RISER
- RIP RAP ENERGY DISSIPATOR
- FLARED END SECTION
- 1 — DRAINAGE SYSTEM
- BSW — BIO-SWALE

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# COASTAL BMP LAYOUT

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**BMP-01**

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|---|---|---|---|---|
| 9/06 | - | 9/06 | - | MICHAEL E. ENDRES P.E. |
| 9/06 | - | 9/06 | - | CHECKED BY |

CALTRANS DESIGN OVERSIGHT
LISA RAMSEY
REGISTRATION NO.
DATE

Transportation Corridor Agencies

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| 11 | SD | 241 | 0.0/1.3 | 22 | |

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NAME NO. EXP. DATE CIVIL STATE OF CALIFORNIA

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IRVINE, CA. 92618

PARSONS TRANSPORTATION GROUP
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IRVINE, CA. 92612

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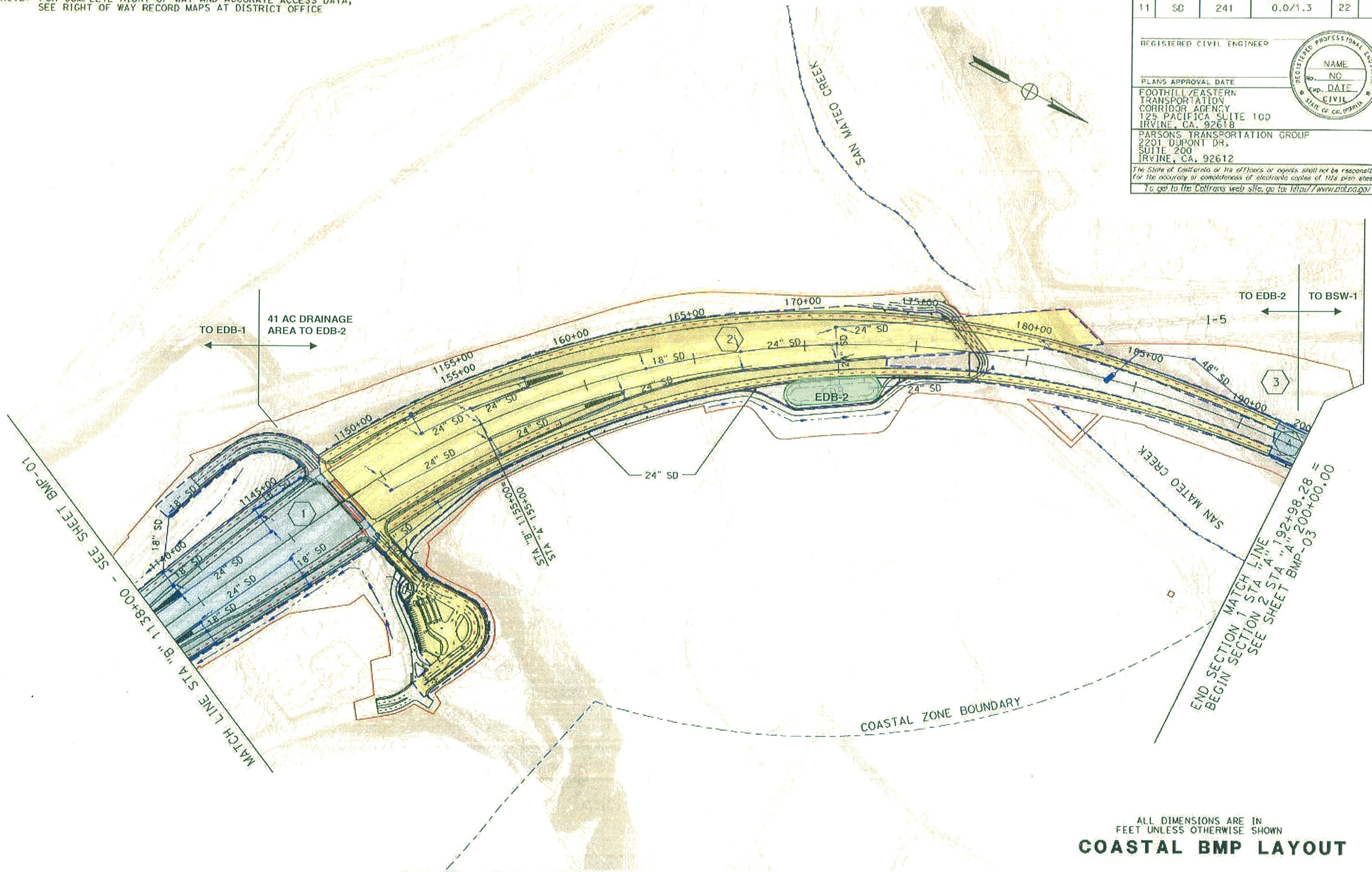


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# COASTAL BMP LAYOUT

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**BMP-02**

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|---|---|---|
| 9/06 | - | 9/06 |

CALCULATED/DESIGNED BY - | CHECKED BY -

TCA DESIGN MANAGER: MICHAEL E. ENDRES P.E.

CALTRANS DESIGN OVERSIGHT: LISA RAMSEY | REGISTRATION NO. | DATE

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| DIST | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET NO. | TOTAL SHEETS |
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PLANS APPROVAL DATE

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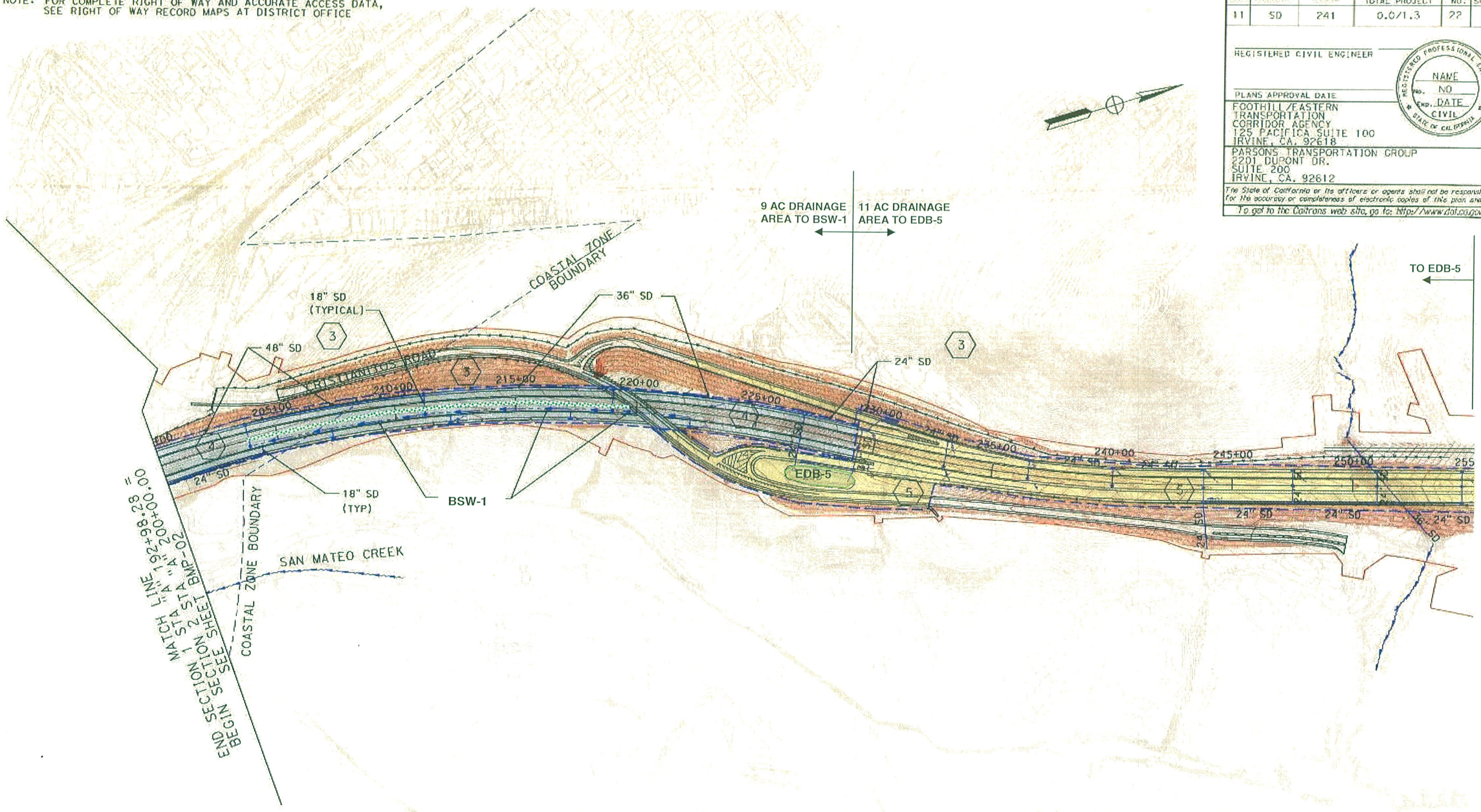


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# COASTAL BMP LAYOUT

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BMP-03

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|---|---|---|---|
| LISA RAWSEY | REGISTRATION NO. | CHECKED BY | MICHAEL E. ENDRES P.E. |
| | DATE | | |

| DATE | REVISED BY | - | - |
|---|---|---|---|
| 9/06 | DATE REVISED | 9/06 | |

Transportation Corridor Agencies

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# APPENDIX C

# VEGETATION SHADING ANALYSIS

# VEGETATION SHADING ANALYSIS FOR THE PROPOSED SAN MATEO AND SAN ONOFRE BRIDGE STRUCTURES FOR THE FOOTHILL TRANSPORTATION CORRIDOR-SOUTH PROJECT

**Prepared by:**

**BONTERRA CONSULTING**
**Ann M. Johnston**
**Principal, Biological Services**

This is a summary of the vegetation shading analysis conducted for the proposed San Mateo and San Onofre bridge structures for the Foothill Transportation Corridor-South (FTC-South) project. The analysis for the FTC-South project is based on the engineering plans of the proposed bridge structures over San Mateo and San Onofre creeks, the "Revised Shading Study Associated with Two Proposed Bridges, Spanning Existing Wetlands on the Marblehead Coastal Site, San Clemente, California," prepared by Glenn Lukos Associates (GLA; December 4, 2001), and known biological resources at these locations. The findings in the GLA document were utilized in support of the California Coastal Commission Coastal Development Permit for the Marblehead Coastal project currently under construction.

The following table outlines the existing bridge conditions and the proposed bridge expansions.

| Creek Crossing | Existing Bridge Length (approx.) | Existing Bridge Width (approx.) | Existing Bridge Height Above Grade (approx.) | Proposed Bridge Length Over ACOE Ordinary High Water Mark (approx.) | Proposed Bridge Width (approx.) | Proposed Bridge Height Above Grade (approx.) |
|---|---|---|---|---|---|---|
| San Mateo | 500 ft | 165 ft (including 30 ft gap between the two separate bridge spans) | 55 ft | Southbound Connector – 300 ft above the existing I-5/San Mateo Creek bridge<br><br>Northbound Connector – 920 ft, none of which occurs over the existing I-5/San Mateo Creek bridge | Southbound Connector – 42 ft wide<br><br>Northbound Connector – 42 ft | Southbound Connector – 82 ft above existing grade, and 28 ft above the I-5<br><br>Northbound Connector – 43 ft above grade |
| San Onofre | 354 ft | 165 ft (including 30 ft gap between the two separate bridge spans) | 30 ft | 90 ft (the total bridge length of 354 ft remains the same) | 40 ft on both the northbound and southbound lanes | 30 ft |

ACOE = United States Army Corps of Engineers
ft = feet

Based on transect data collected along the southern edge of the creek directly beneath the existing northbound bridge and immediately upstream, the GLA report concluded that the vegetation beneath the San Mateo Bridge exhibited similar canopy cover compared to those areas outside the shaded areas of the San Mateo Bridge. Resources adjacent to and under the existing San Onofre Bridge include southern riparian scrub and associated hydrophilic vegetation. In summary, there was no distinguishable difference between areas that were shaded by the bridge structure or not shaded by the bridge structure.

## Conclusion

The proposed northbound connector will span approximately 920 ft of the ACOE jurisdiction of the San Mateo Creek containing southern riparian scrub and associated understory vegetation, similar to the existing I-5/San Mateo Creek Bridge. Based on the similarity of the height of the existing I-5/ San Mateo Creek Bridge and the proposed northbound connector, it is expected that the construction of the proposed project would not have a measurable impact on the existing riparian vegetation under the proposed northbound connector.

The proposed southbound connector will similarly not have a measurable impact on the vegetation underneath the connecter based on the comparison of the existing vegetation of the I-5/San Mateo Creek Bridge and those resources that will be bridged by the southbound connector. However, there will be a small segment of the southbound connector that will ride over the existing bridge structure at the I-5/San Mateo Creek, which would increase the shading in the San Mateo Creek beyond those conditions that currently exist. This area of 0.29 acre (42 ft wide, 300 ft long) would contribute to additional shading within the San Mateo Creek area. However, this is not a substantial enough area to be expected to result in significant changes to the vegetation community under the southbound connector.

The proposed expansion of the bridge at San Onofre Creek will be similar to the existing I-5/ San Onofre Creek Bridge. Based on the similarity of the height of the existing I-5/San Onofre Creek Bridge and the proposed expansion, it is expected that the construction of the proposed project would not have a measurable impact on the existing riparian vegetation under the proposed San Onofre Creek Bridge.