NATURAL ENVIRONMENT STUDY REPORT FOR THE EL CAMINO REAL ROAD/BRIDGE WIDENING PROJECT

Project #2982, Sch. No. Pending

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I. SUMMARY OF FINDINGS AND CONCLUSIONS

A series of surveys were conducted to assess the biological resources of the proposed El Camino Real Road/Bridge Widening Project. Six alternatives have been developed for this project: the Central Alignment Alternative, the Road Capacity Alternative, the Bicycle Safety Alternative, the Western Alignment Alternative, the Eastern Alignment Alternative, and the Lower Elevation Alternative. These alternatives differ in their road capacity, inclusion of pedestrian or bicycle facilities, elevation, and alignment, i.e., shifted to the east or west of existing El Camino Real Road.

Biological resources surveys conducted in the project area included delineation of vegetation communities along the project right-of-way, delineation of U. S. Army Corps of Engineers (ACOE) jurisdictional wetland areas, and identification of observed plant and wildlife species. Protocol surveys for the federally endangered arroyo toad and federal and state endangered least Bell's vireo were conducted. In addition, focused surveys for the light-footed clapper rail and state endangered Belding's Savannah sparrow also were conducted. Habitat assessments were conducted for federally endangered Quino checkerspot butterfly, Pacific pocket mouse, light-footed clapper rail, and southwestern willow flycatcher.

Disturbed coastal brackish marsh and developed areas dominate the project alignment. Other habitats observed within the alignment include southern willow scrub, disturbed southern willow scrub, disturbed mule-fat scrub, disturbed southern coastal salt marsh and remnant patches of disturbed Diegan coastal sage scrub. Disturbed areas and ornamental plantings also comprise portions of the project alignment.

The wetland delineation conducted along the proposed alignment determined that ACOE jurisdictional wetland, as well as jurisdictional areas defined by California Department of Fish and Game (CDFG) and the City of San Diego, occur along the San Dieguito River channel. Jurisdictional habitat also exists within drainages that parallel the northeast side of the existing El Camino Real and portions of Via de la Valle.

Protocol surveys to determine the presence or absence of arroyo toad resulted in negative findings and more recent habitat assessments determined that suitable habitat does not exist for this species in the project area. Based on these survey results, the USFWS determined that further surveys for this species will not be required in support of the proposed project.

Habitat assessments conducted in 1999 indicated that suitable habitat for Pacific pocket mouse does not exist on-site. Habitat assessments conducted in 2004 for southwestern willow flycatcher and Belding's Savannah sparrow resulted in negative findings. A habitat assessment conducted in the project area in 2005 also determined that suitable habitat does not exist for Quino checkerspot butterfly.

A review of a focused survey report submitted to Caltrans indicated that light-footed clapper rail had been detected in the project area as recently as 2001. A habitat assessment conducted in 2004 and a focused survey conducted for this species in 2005 determined that the species does occur in the project area. Subsequent surveys of the project vicinity conducted for the USFWS indicates that the light-footed clapper rail population in the area has expanded rapidly. Informal consultation with the California Department of Fish and Game and U.S. Fish and Wildlife Service has been initiated. Least Bell's vireo also were detected during a concurrent habitat assessment in 2004.

The California Natural Diversity Data Base (CNDDB) identified several sensitive plant and animal species that had been recorded in the vicinity of the proposed project. A concerted effort was made to locate and identify all such sensitive species during general and protocol surveys of the site. California Species of Special Concern that were observed in the project area include northern harrier, white-faced ibis and yellow warbler. In addition, American bittern, a federal species of concern was observed within the project area. As stated above, state and federally endangered light-footed clapper rail and least Bell's vireo were observed during habitat assessments and protocol surveys of the project area.

Portions of the proposed project alignment are included in the Multiple Habitat Preserve Area (MHPA) of the City of San Diego's Subarea plan for the Multiple Habitat Conservation Program (MSCP). Project conformance with the objectives of the MSCP Subarea plan is discussed in this report. The project does not conflict with the conditions of coverage for any of the MSCP-covered species potentially occurring in the project area. Furthermore, it is not anticipated that the proposed project will result in impacts to narrow endemic plant species. Although project construction will result in potential disruption of wildlife movement associated with the existing El Camino Real bridge, this indirect impact is expected to be temporary. Areas under the bridge currently used for wildlife movement will be revegetated and wildlife will be free to move under the newly constructed bridge upon project completion.

The proposed project lies within the focused planning area of the San Dieguito River Park. It is also located directly east of the San Dieguito Wetland Restoration Project that was developed within Landscape Unit A as identified in the San Dieguito River Park Concept Plan. The proposed road and bridge widening conforms with the objectives of these plans. The project does not conflict with existing or proposed park facilities.

Several sensitive wetland habitats exist in the project area. City of San Diego-designated riparian scrubs observed in the project area include southern willow scrub, disturbed southern willow scrub, and disturbed mule-fat scrub. City of San Diego-designated coastal wetlands include disturbed southern coastal salt marsh and disturbed coastal brackish marsh. The Eastern Alignment Alternative would result in the greatest impacts to sensitive wetlands. The Central Alignment and Lower Elevation Alternatives would result in the greatest impacts to sensitive wetland that is considered habitat for the light-footed clapper rail, i.e., the brackish marsh within the San Dieguito River channel.

Mitigation for impacts to wetland habitats will be accomplished at a 3:1 or 4:1 ratio through a combination of restoration, creation and enhancement. Such mitigation has been proposed in accordance with the wetland mitigation ratios summarized in the City of San Diego Land Development Manual, Biology Guidelines (May 2001).

Following an extensive analysis of potential mitigation sites, it was determined that mitigation for wetland impacts would be accomplished on an approximately 75-acre parcel formerly owned by the Boudreau Trust. This parcel is now owned by the San Dieguito River Park Joint Powers Authority.

The proposed project also would result in impacts to disturbed Diegan coastal sage scrub. This vegetation type is considered a Tier II Uncommon Upland habitat by the City of San Diego. The Central Alignment and Lower Elevation Alternatives result in the greatest impacts to sensitive upland habitat. Mitigation will be accomplished at a 1:1 ratio through contribution to the City's Habitat Acquisition Fund.

II. INTRODUCTION

This report documents the results of surveys conducted to assess the existing biological resources along El Camino Real, the site of a proposed road and bridge widening. El Camino Real extends north to south off of Via de la Valle in the City of San Diego and is located approximately 2 km (1.25 miles) east of Interstate 5 (Figures 1 and 2). The existing road consists of two lanes with no shoulder on either side. The proposed project involves widening El Camino Real between Via de la Valle to San Dieguito Road and replacement of the bridge over the San Dieguito River.

Six alternatives have been developed for the proposed widening of El Camino Real. These alternatives, described below, vary in terms of potential for equestrian use, pedestrian walkway, bicycle lanes and median, number of traffic lanes provided, road elevation, and project footprint width and location, i.e., shifted east or west of existing El Camino Real Road. A detailed description of each alternative is provided below.

The biological surveys reported herein were conducted to identify and map the existing vegetation communities and associated biological resources that occur within the alternative alignments, to delineate wetlands, and to determine the presence or absence of sensitive species including the federally endangered arroyo toad (*Bufo californicus*), federal and state endangered least Bell's vireo (*Vireo pusillus bellii*), federal and state endangered and fully protected light-footed clapper rail (*Rallus longirostris levipes*), federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*) and Quino checkerspot butterfly (*Euphydryas editha quino*) and state endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*).

In addition to biological surveys conducted along the proposed project alignment, documents pertaining to the project area were reviewed including the MSCP Subarea Plan, San Dieguito River Park Concept Plan and the Final Program Environmental Impact Report for the San Dieguito River Park Concept Plan.

Based on preliminary studies, it was determined that the design known as the Central Alignment Alternative would present the fewest environmental constraints. Five additional alternatives, also presented in this report, are variations of the Central Alignment concept developed to maximize avoidance of environmental impacts. This report serves as the biological technical report in support of the Environmental Impact Report/Environmental Assessment (EIR/EA) that is being prepared concurrently in accordance with the California Environmental Quality Act and the National Environmental Policy Act.

A. Project Description

The following section describes the features of the Central Alignment Alternative and the five variations of that alternative. For all six alternatives, a staging area has been proposed at the southern end of the project area, just northeast of the junction of El Camino Real Road and San Dieguito Road. The area of impact proposed for each alternative is delineated with a pink line in Figures 6 through 9. For each alternative, the delineated area includes proposed construction as well

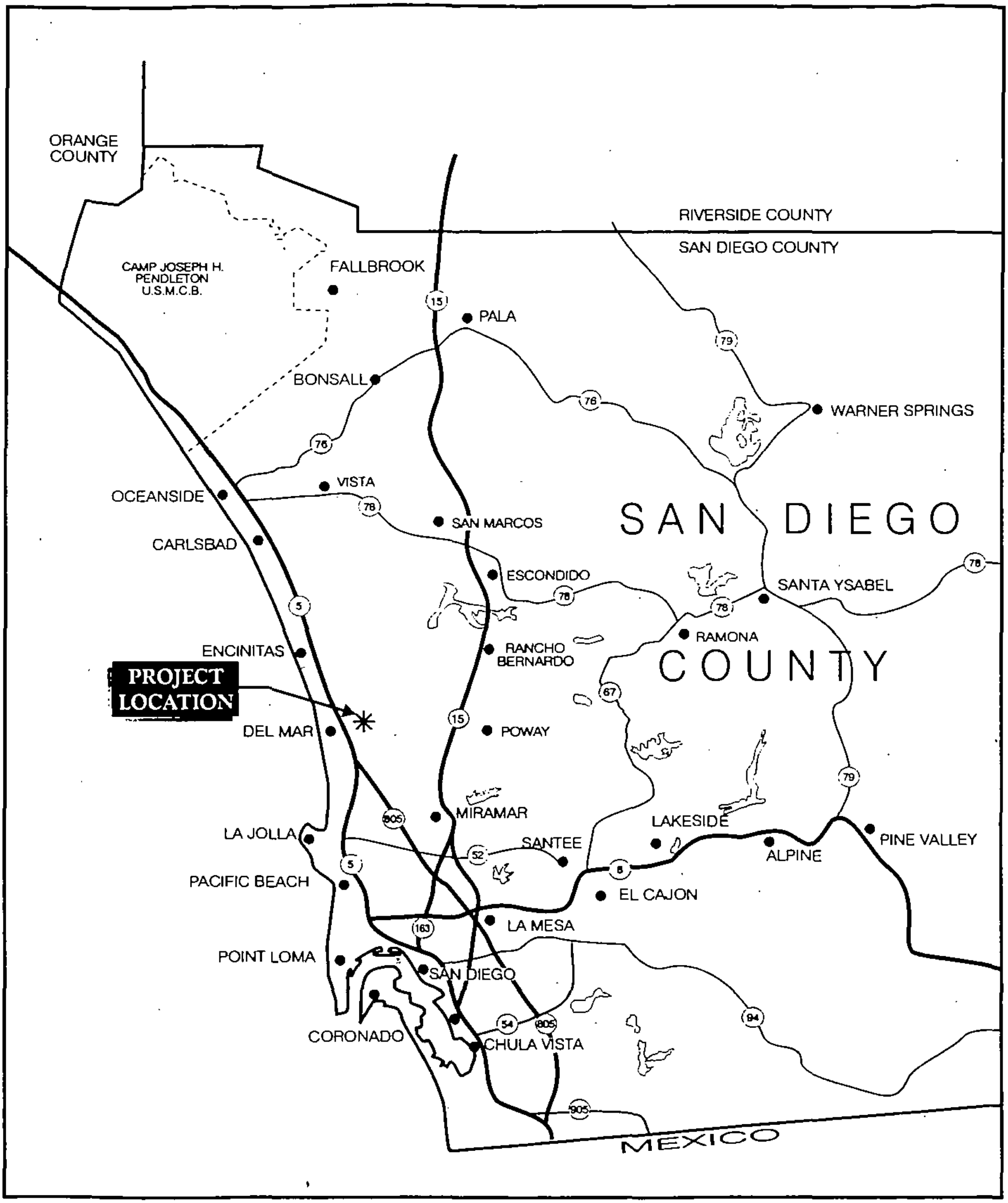

Figure 1
Regional Location Map

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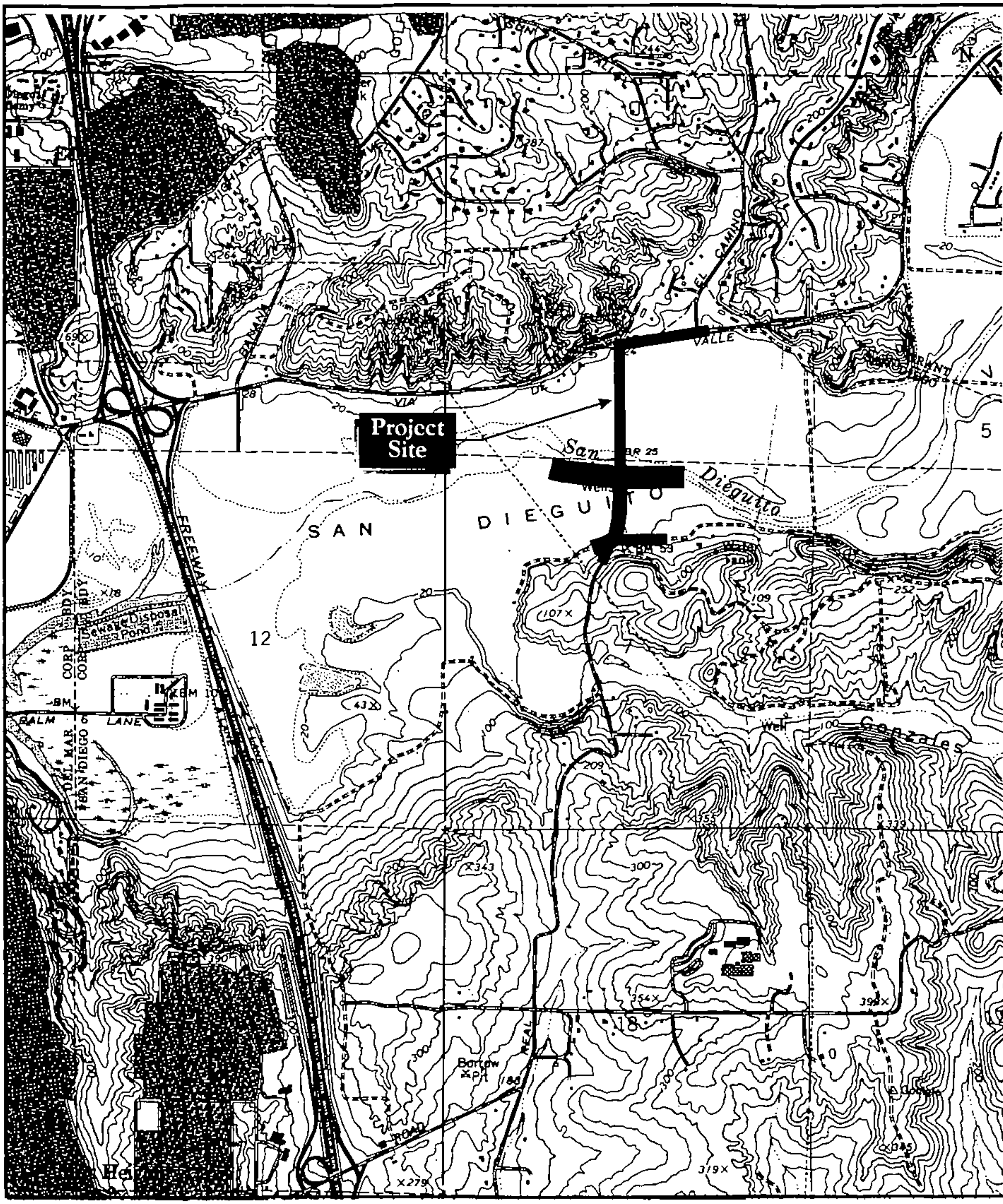

SOURCE: USGS 7.5' Quad Maps (Del Mar 1969 Edition Photorevised in 1975)

Figure 2
Project Location Map

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as staging corridors that will be disturbed only during project construction. Such areas are referred to hereafter as construction corridors. It is anticipated that these areas will be restored to their original condition following project completion.

All of the build alternatives analyzed in detail in this report would provide the following key components:

- The roadway of El Camino Real would be raised above the 100-year flood level from San Dieguito Road to Via de la Valle.

- The bridge over the San Dieguito River would be replaced with a new structure that would be approximately the same length as the existing bridge, and raised above the 100-year flood level. The bridge would be supported on bridge piles that would be cast-in-drilled-hole construction, would have continuous cylindrical shape about 7 feet in diameter, and would extend to a depth of approximately 90 feet below the ground. Above the ground, the piles would become cylindrical finished concrete columns (piers) about 5 feet in diameter.

- Via de la Valle would be widened to its ultimate width from the modified intersection with El Camino Real eastward to El Camino Real North. The drainage channel along the south edge of Via de la Valle would be relocated further south and enlarged to carry a 100-year flow from the upstream watershed, estimated to be approximately 600 cubic feet per second (cfs). The corrugated metal pipe storm drain under Via de la Valle at El Camino Real North would be replaced with a concrete box sized to pass a 100-year flow from upstream.

- Project impacts to wetlands would be mitigated by enhancement and creation on the JPA (former Boudreau) property west of the affected portion of el Camino Real (see Section IX. Mitigation Measures).

For all build alternatives, Via de la Valle would be widened to its ultimate width from the modified intersection with El Camino Real eastward to El Camino Real North. The cross section for Via de la Valle would have the following elements, from the north side (existing curb line) to the south side with the widths listed:

Bicycle lane	8 feet
Outside travel lane	12 feet
Inside travel lane	12 feet
Median (raised)	14 feet
Inside travel lane	12 feet
Outside travel lane	12 feet
Bicycle lane	8 feet
Pedestrian walkway/parkway	22 feet
Total width for Via de la Valle roadway cross section (all alternatives)	*100 feet*

Central Alignment Alternative

The Central Alignment Alternative would involve the construction of a new bridge. The roadway would be widened to 37 m (122 feet) in order to accommodate four travel lanes, bike lanes and a pedestrian walkway/parkway. The entire length of the road would be elevated above the 100-year flood level on 0.6 to 3.0 m (2 to 10 feet) of fill. The existing bridge would be demolished and replaced with a box girder structure. The Central Alignment Alternative also would allow for the construction of a multi-use trail under crossing. This crossing proposed by the Joint Powers Authority (JPA) would consist of a trail platform set at the projected 10-year flood level.

The implementation of this alternative would impact sensitive wetland habitats contained in two drainage ditches located adjacent to the proposed project alignment (see Section VII. Project Impacts). Consequently, five alternatives have been developed.

The Eastern Alignment and Lower Elevation Alternatives include modifications developed to minimize impacts to adjacent recreational land and to minimize visual impacts, respectively. All five alternatives of the Central Alignment are presented below. From this point on, these variations are presented as project alternatives.

Road Capacity Alternative

This alternative would have a reduced project footprint (18.3 m (60 feet) in width) and an alignment shift to the west to avoid the existing drainage channel that parallels the eastern side of El Camino Real Road. The objective of this alternative is to increase road capacity. The project would replace the bridge, raise the road and widen it to 18.3 m (60 feet) to accommodate four traffic lanes. Retaining walls would be required on both sides of the road. At the same time, the parkway, pedestrian walkway, bicycle lanes and median would be eliminated. This alternative would not provide left turn pockets for recreational or commercial facilities located along El Camino Real Road.

Bicycle Safety Alternative

Like the Road Capacity Alternative, this alternative would have a reduced project footprint (18.3 m (60 feet) in width) and an alignment shift to the west to avoid the drainage ditch to the east. However, the focus of this alternative would be to enhance public safety for bicyclists. Thus, the project would include a bridge replacement and raising the road but would accommodate only two traffic lanes. Retaining walls would be constructed on both sides of the raised road. Bicycle lanes and a median would be included in this alternative but the parkway and pedestrian walkway would be eliminated.

Western Alignment Alternative

This alternative would include both the increased road capacity and safety features described for the Road Capacity and Bicycle Safety Alternatives. Thus, the project would include a bridge replacement and raising and widening the road to 37 m (122 feet). Again, the adjacent drainage ditch would be avoided with an alignment shift to the west. However, in order to accommodate all the proposed components of this alternative, additional right-of-way would have to be acquired from the Horse Park and private landowners at Via de la Valle and San Dieguito Road. For this alternative, slopes would be created on both sides of the road.

Eastern Alignment Alternative

This alternative would have the same road width as the Central Alignment and Western Alignment Alternatives (37 m (122 feet). However, for this alternative, the alignment would be shifted to the east to minimize right-of-way requirements from the adjacent Horse Park and to avoid the drainage ditch located directly east of El Camino Real Road. Additional right-of-way would have to be acquired from other landowners adjacent to El Camino Real Road. This alternative would require that the new El Camino Real Road align with De La Valle Place, thus eliminating the existing intersection at Via de la Valle. Similar to the Western Alignment Alternative, slopes would be constructed on both side of the road for this alternative.

Lower Elevation Alternative

This alternative was developed to address concerns regarding visual impacts resulting from the proposed improvements to El Camino Real Road. The Lower Elevation Alternative would involve the same horizontal alignment and project features as the Central Alignment Alternative and would be 37 m (122 feet) in width. This variation would raise the bridge just enough to accommodate the 100-year flood. At this lower elevation, the bridge would not accommodate the JPA multi-use trail under crossing that was proposed on a platform above the estimated 10-year flood level. However, the crossing of the river bed by equestrians would not be affected.

Anticipated Project Schedule

It is anticipated that project construction will commence in 2007. Project duration will vary according to the design alternative chosen. For Eastern Alignment Alternative, bridge replacement would require approximately 67 weeks; the Road Capacity and Bicycle Safety Alternatives would require approximately 78 weeks; and for the Central Alignment, Western Alignment and Lower Elevation Alternatives, bridge replacement would take approximately 82 weeks. A project schedule for road construction has not yet been determined.

III. STUDY METHODOLOGY

A. Studies Required

Numerous biological surveys were conducted along the proposed project alignment. Vegetation within the project area was mapped initially in 1998. Additional surveys were conducted in 2003 to verify vegetation mapping and to make any necessary modifications. Surveys were conducted on foot. Vegetation communities were mapped on a 1" = 200' scale aerial photograph of the project area. Wildlife species were identified by unaided observation or with binoculars.

A search of the California Natural Diversity Data Base (CNDDB; CDFG 2003a) was conducted prior to the surveys to assess the potential for sensitive species to occur in the area. The CNDDB is a computerized inventory of sensitive species locations maintained by the Natural Heritage Division of the California Department of Fish and Game (CDFG). During field surveys, the project area was evaluated for the potential occurrence of such species.

At the time of the initial vegetation surveys, a wetland delineation was also performed using the routine method defined by the to U. S. Army Corps of Engineers protocol (1987). The wetland delineation is discussed in detail in Section VI. In Depth Studies for Special Laws, Part B. An updated delineation also was conducted for the proposed project in 2004.

The project area also was evaluated to determine the potential occurrence of federally endangered Quino checkerspot (*Euphydryas editha quino*). Results of this habitat assessment are included in Section V. Important Biological Resources in the Project Area, Part D and also are presented in Attachment D. An updated habitat assessment for this species also was conducted according to USFWS Quino checkerspot survey protocol (2002) in 2005.

In response to the concerns of the U. S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG) and the City of San Diego, habitat assessments were conducted for Pacific pocket mouse (*Perognathus longimembris pacificus*), southwestern willow flycatcher (*Empidonax traillii extimus*) and light-footed clapper rail (*Rallus longirostris levipes*). In addition to habitat evaluations, protocol surveys for the federally endangered arroyo toad (*Bufo microscaphus*), and least Bell's vireo (*Vireo pusillus bellii*) were conducted. Focused surveys for state endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) were conducted in the project area. Updated habitat assessments for least Bell's vireo, southwestern willow flycatcher, Belding's savannah sparrow, and light-footed clapper rail also were conducted in 2004. A focused survey was conducted for light-footed clapper rail in 2005. A focused bat survey was conducted in 2006.

B. Survey Dates and Personnel

This section presents the dates, personnel and weather conditions for biological surveys conducted in support of the proposed project. Table 1 summarizes this information for general vegetation surveys, wetland delineations and Quino checkerspot habitat assessments performed in support of the proposed project between 1998 and 2005.

A habitat assessment for Pacific pocket mouse was conducted by M. Pavelka of the USFWS in Spring 1999. Habitat assessments for southwestern willow flycatcher and light-footed clapper rail were conducted by B. Haas of Varanus Biological Services on July 15, 2003 between the hours of 1200 and 1230. Weather conditions during these surveys consisted of 100% cloud cover, air temperature of approximately 70° F and no wind.

Three protocol surveys for the arroyo toad were conducted by C. Nordby and A. Eng on May 15, 18, and 19, 1998. Additional surveys were conducted on May 13, 17, and 18, 1999. Surveys were conducted according to the USFWS-approved protocol at that time as summarized below:

- Three surveys during the arroyo toad breeding season are required to determine the presence or absence of the species. The breeding season extends from March 15 to May 30 at sites between sea level and 457 m (1,500 feet) elevation and between April 1 and May 30 at sites above 457 m (1,500 feet) elevation.

- Surveys should be conducted between one hour after dusk and midnight.

- Surveys should not be conducted on nights with a full moon, when air temperature at dusk is less than 55° F, or during adverse conditions such as rain, high winds or flood flows.

- Surveyors must walk on the creek bank at least 3 m (10 feet) from the water's edge. Stream crossings should be downstream from potential breeding pools or in fast flowing channels.

Surveys were conducted along the San Dieguito River at least 30.4 m (100 feet) beyond the project area boundaries. Two day-time surveys of the project area were conducted. Surveys involved walking along the river bank up to approximately 91.5 m (300 feet) from the proposed project right-of-way, evaluating vegetation as potential toad habitat and searching for arroyo toad adults, larvae and eggs. Three night-time surveys involved listening for response vocalizations from the project area. Table 2 summarizes survey dates and times, and weather conditions at the beginning and end of each night-time survey.

Table 1. Summary of Biological Surveys

Survey Type	Personnel	Dates and Times	Weather Conditions
Vegetation	C. Nordby, A. Eng	June 15, 1998 between 1330 and 1530	air temperature 70° F; scattered clouds; wind from the west at 0 to 5 mph
Vegetation	C. Nordby, A. Eng	July 1, 1998 between 0800 and 1100	air temperature 65° F; coastal fog; wind from the west between 3 to 5 mph
Wetland Delineation	C. Nordby, A. Eng	July 31, 1998	air temperature between 75 and 80° F; clear skies; wind between 0 and 5 mph.
Quino Checkerspot Habitat Assessment	C. Nordby, A. Eng and A. Pigniolo	May 18, 1999 between 1330 and 1600 and May 29, 1999 between 0900 and 1130	1st survey: air temperature approximately 65° F; clear skies; wind from the west between 5 to 10 mph; 2nd survey: overcast skies, air temperature of approximately 65° F.
Quino Checkerspot Habitat Assessment	C. Nordby, A. Eng and A. Pigniolo	May 25, 1999 between 0900 and 1130	air temperature approximately 65° F; overcast skies
Vegetation	E. Alfaro, M. Alfaro	May 20, 2003 between 0900 and 1500	air temperature approximately 70 to 72° F; 100% cloud cover at the start of the survey and clear skies at the end of the survey; no wind.
Vegetation	C. Nordby, E. Alfaro, M. Alfaro	July 10, 2003 between 1100 and 1230	air temperature approximately 60° F; 100% cloud cover, haze; wind between 0 and 5 mph.
Wetland Delineation	C. Nordby	December 20, 2004 between 1000 and 1230	air temperature approximately 65°F; clear skies; wind between 0 and 5 mph.
Quino Checkerspot Habitat Assessment	E. Alfaro, M. Alfaro	January 12, 2005 between 1100 and 1130	air temperature approximately 62°F; 10% cloud cover; wind between 0 and 2 mph

In 1999, the USFWS developed new protocol arroyo toad surveys. These protocol include the following instructions:

- Areas within 1 km of arroyo toad sites shall be presumed to have arroyo toads;
- At least six surveys must be conducted during the breeding season which generally occurs from March 15 through July 1, with at least seven days between surveys;
- At least one survey shall be conducted per month during April, May and June;
- Daytime surveys should involve walking slowly along stream margins and in adjacent riparian habitat, visually searching for eggs, larvae, and juveniles. Surveyors should use caution to avoid disturbing breeding toads. These surveys should include an assessment and mapping of arroyo toad habitat suitability and the presence of arroyo toad eggs, larvae, or juveniles;
- Nighttime surveys should be conducted by walking slowly and carefully on stream banks. Surveyors should stop periodically, remain still and silent for approximately 15 minutes to wait for arroyo toads to begin calling.

Table 2. Arroyo Toad Protocol Survey Field Conditions

Date of Survey	Time of Survey	Conditions
May 15, 1998	1330 to 1530	----
May 15, 1998	2000 to 2200	clear skies, 65° F, low wind
May 18, 1998	2000 to 2200	clear skies, 65° F, low wind
May 19, 1998	2000 to 2200	clear skies, 55°- 60° F, low wind
May 13, 1999	1330 to 1600	----
May 13, 1999	2030 to 2200	clear skies, 59° F, no moon
May 17, 1999	2030 to 2200	clear skies, 60° F, no moon
May 18, 1999	2030 to 2200	clear skies, 57° F, partial crescent moon

Although new protocol surveys have not been conducted in support of the proposed project, recent vegetation surveys in the project area indicate that conditions have become increasingly saline. As stated in the 1999 protocol survey report, such conditions would not be considered suitable habitat for the arroyo toad. Thus, additional protocol surveys will not be conducted for this species. John DeGregoria of the USFWS has confirmed that additional surveys for arroyo toad will not be necessary for this project (pers. comm. Oct. 13, 2004).

Protocol surveys for least Bell's vireo were conducted by M. Alfaro and E. Alfaro according to USFWS protocol summarized below:

- All areas of potential vireo habitat should be surveyed 8 times. Surveys are to be a minimum of 10 days apart, once a week from April 10 to July 31. Surveys may be extended to August 31.

- Surveys shall be conducted between dawn and 1100 and shall avoid excessive or abnormal heat, wind, rain or other inclement weather.

- All vireo detections should be used to estimate the location and extent of individual home ranges

- Surveyors should not survey more than 3 linear kilometers or more than 50 hectares of habitat on any given day.

- Surveys should be conducted by a qualified biologist familiar with the songs, whisper songs, calls, scolds and plumage characteristics of adult and juvenile vireos.

- Data pertaining to vireo status and distribution (e.g. numbers and locations of paired or unpaired territorial males, ages and sexes of all birds encountered) should be noted and recorded during each survey. In addition, surveyors should look for leg bands on vireo adults and juveniles if possible without harrassing the bird.

- The numbers and locations of all brown-headed cowbirds (*Molothrus ater*) detected within vireo territories should be recorded during each survey and subsequently reported to the USFWS.

- No attempts should be made to closely approach or examine vireo nests unless authorized by CDFG and USFWS.

- A final report should be submitted to the USFWS within 60 days of the completion of the survey.

Table 3 presents a summary of dates, times and weather conditions for each vireo survey.

Table 3. Least Bell's Vireo Protocol Survey Field Conditions

Date of Survey	Time of Survey	Conditions
April 19, 2002	0800 to 1000	60% cloud cover, 68 to 70° F, 0 to 2 mph wind
May 5, 2002	0830 to 1030	30% cloud cover, 70° F, 0 to 2 mph wind
May 15, 2002	0915 to 1100	100% cloud cover, 62 to 68° F, 0 to 3 mph wind
June 20, 2002	0955 to 1030	100% cloud cover, 68° F, no wind
July 1, 2002	0945 to 1020	80% cloud cover, 70° F, 3 mph wind from the southwest
July 9, 2002	0850 to 0925	80% cloud cover, 70° F, 3 mph wind from the southwest
July 20, 2002	0950 to 1020	no cloud cover, 70° F, no wind
July 30, 2002	0940 to 1010	70% cloud cover, 69° F, 1 mph wind

No CDFG protocol exists for focused Belding's Savannah sparrow surveys. Thus, focused surveys involved walking through areas of potentially suitable habitat while listening and looking for this species. Dates, times and weather conditions during these surveys are summarized in Table 4.

Table 4. Belding's Savannah Sparrow Focused Survey Field Conditions

Date of Survey	Time of Survey	Conditions
July 10, 2003	1000 and 1100	light mist, 65° F, wind 0 to 2 mph
July 21, 2003	1200 and 1300	75° F, wind 0 to 2 mph
July 25, 2003	0920 and 1020	100% cloud cover, 70-72° F, no wind

In 2004, updated habitat assessments for least Bell's vireo, southwestern willow flycatcher, Belding's savannah sparrow, and light-footed clapper rail were conducted by B. Haas of Varanus Biological Services. These surveys were conducted on May 17, 21 and 27. Dates, times and weather conditions during these surveys are summarized in Table 5. Survey methodology involved walking along the edge of the San Dieguito River and along horse trails along and through the river bottom in the vicinity of El Camino Real. Mr. Haas recorded species aurally detected in the project area. Because light-footed clapper rail were detected during these surveys, a site visit of the project area was conducted by B. Haas, J. Konecny and D. Zembal on May 21, 2004. Audio-tape was utilized during that survey to elicit vocalizations from the clapper rail. Due to the lateness of the census, survey results were conservative. Results of the updated habitat assessments and focused clapper rail survey are presented in Section V.D. Special Status Wildlife Species.

Table 5. Avian Habitat Assessment Field Survey Conditions

Date of Survey	Time of Survey	Conditions	Surveyors
May 17, 2004	530 to1030	100% cloud cover (80% at end of survey), 65-78° F, no wind	B. Haas
May 21, 2004	1100 to 1330	80% cloud cover (40% at end of survey), 78-79° F, wind 0 to 3 mph from SW	B. Haas, J. Konecny, D. Zembal
May 27, 2004	1830 to 2030	clear skies, 76-73° F, 0 to 5 mph from SW	B. Haas, C. Nordby

A focused survey for light-footed clapper rail was conducted by D. Zembal and S. Hoffman on March 31, 2005. Light-footed clapper rail vocalizations were played on tape during the survey. Results of this survey are presented in Section V.D. Special Status Wildlife Species.

A focused survey to determine the presence/absence of bat species was conducted by A. Clark of RECON on March 16, 2006 between the hours of 1720 and 1830. The survey encompassed the project area and adjacent agricultural fields.

C. Problems Encountered and Limitations that May Influence Results

With the exception of arroyo toad surveys, all biological surveys were conducted during daylight hours. Therefore, secretive and nocturnal wildlife species may not have been observed even if present. It is possible that plant species with blooming periods before or after the general biological surveys were conducted might have been overlooked. However, this is unlikely as the project area was surveyed repeatedly over a period of approximately 6 years. Furthermore, it is not likely that other sensitive species exist on-site but were not detected.

D. Definitions of Terms Used in the Report

Nomenclature used in this report conforms to Holland (1986) for vegetation; Hickman (1993) and Simpson and Rebman (2001) for plants; Sibley (2000) for birds; Jameson and Peeters (1988) for mammals; and Stebbins (1985) for reptiles and amphibians.

IV. ENVIRONMENTAL SETTING

A. Description of the Biological Communities

Botany

Vegetation communities are described in this report according to classifications defined in Holland (1986). Eight vegetation types were identified within the project area including southern willow scrub, disturbed southern willow scrub, and disturbed mule fat scrub, all considered riparian scrub by the City of San Diego; disturbed coastal brackisb marsb and disturbed soutbern coastal salt marsh, both considered coastal wetland by tbe City of San Diego; disturbed Diegan coastal sage scrub, ruderal and ornamental vegetation (Figures 3a, b and c). Disturbed areas and developed areas are subject to repeated clearing or support structures, respectively. As a result, these areas support little or no vegetation and, therefore, are not described below. A complete list of plant species observed within the project area boundaries is presented in Attachment A.

Southern willow scrub is characterized by dense, broadleaf, winter-deciduous riparian thickets dominated by several willow (*Salix*) species, with scattered Fremont's cottonwood (*Populus fremontii* ssp. *fremontii*) and western sycamore (*Platanus racemosa*). Most stands of southern willow scrub are dense with minimal understory development and occur on loose, sandy or fine gravelly alluvium near stream channels (Holland 1986).

On-site, disturbed southern willow scrub includes a relatively large proportion of exotic species. Southern willow scrub exists at the southwestern edge of the project site and consists of a monotypic stand of arroyo willow (*Salix lasiolepis*). Disturbed soutbern willow scrub exists within and along the edge of the San Dieguito River channel and is dominated by arroyo willow and tamarisk (*Tamarix ramosissima*). Other species associated with disturbed southern willow scrub include yerba mansa (*Anemopsis californica*), annual beard grass (*Polypogon monspeliensis*), Goodding's black willow (*Salix gooddingii*), wild radish (*Raphanus sativus*), mule fat (*Baccharis salicifolia*), yellow sweetclover (*Melilotus officinalis*), salt heliotrope (*Heliotropium curavassicum*), saltgrass (*Distichlis spicata*) and western ragweed (*Ambrosia psilostachya*). Both southern willow scrub and disturbed southern willow scrub are categorized by the City of San Diego as riparian scrub habitat.

Mule-fat scrub is a depauperate, tall, herbaceous riparian scrub dominated by mule-fat and maintained by frequent flooding (Holland 1986). Species typically associated with this community include arroyo willow, hoary nettle (*Urtica dioica* ssp. *holosericea*), and narrow-leaved willow (*Salix exigua*). In the project area, disturbed mule-fat scrub is dominated by mule-fat and arrow weed (*Pluchea sericea*) and also includes a relatively high proportion of non-native, weedy species. Species associated with disturbed mule-fat scrub in the project area include tamarisk, hoary nettle, annual beard grass, wild radish, horseweed (*Conyza canadensis*), jimson weed (*Datura wrightii*), sedge (*Carex* sp.) and scarlet pimpernel (*Anagallis arvensis*). This vegetation community was observed along both sides of the San Dieguito River channel. Mule-fat scrub is categorized by the City of San Diego as riparian scrub habitat.

Southern coastal salt marsh is a highly productive, herbaceous and salt tolerant vegetation community forming moderate to dense cover up to 1 meter (3 feet) tall. These areas are subject to regular tidal flooding and are usually found around lagoons, sheltered margins of bays, and estuaries. Typical plants found in southern coastal salt marsh habitat includes pickleweed (*Salicornia* sp.), alkali heath (*Frankenia salina*), saltwort (*Batis maritima*), jaumea (*Jaumea carnosa*), and woolly sea blite (*Suaeda taxifolia*). Salt marsh habitat in the project area occurs within the private property located directly east of El Camino Real Road and south of Via de la Valle Road. This area impounds water for a period of 3 weeks or greater each rainy season. Thus, it is apparent that the soils and hydrology on this parcel provide conditions that would be considered an isolated wetland. Lacking connectivity with waters of the U. S., this wetland may be considered jurisdictional by CDFG and the City, but would not qualify as ACOE jurisdictional habitat. Dominant salt marsh plant species include common pickleweed (*Salicornia virginica*) and salt grass (*Distichlis spicata*). Southern coastal salt marsh is a regionally sensitive plant community.

Coastal brackish marsh is characterized by the presence of perennial, emergent monocots that grow up to 2 m (6 feet) tall and freshwater input that creates brackish conditions. Common species include sedges (*Carex* ssp.), salt grass, rush (*Juncus* sp.), pickleweed (*Salicornia* sp.), bulrush (*Scirpus maritimus*) and cattails (*Typha* sp.) (Holland 1986). Disturbed coastal brackish marsh within the project alignment includes species typical of coastal brackish marsh as well as numerous exotic species. This vegetation type was observed within the San Dieguito River channel, along the eastern edge of El Camino Real, at the southern edge of Via de la Valle, and north of Via de la Valle. Dominant species observed in disturbed coastal brackish marsh include southern cattail (*Typha domingensis*), bulrush (*Scirpus maritimus*) and California bulrush (*Scirpus californicus*). Other species associated with brackish marsh in the project area include tamarisk, curly dock (*Rumex crispus*), saltgrass , western ragweed, brass buttons (*Cotula coronopifolia*), salt bush (*Atriplex* sp.), pampas grass (*Cortaderia selloana*), spiny rush (*Juncus acutus*) and pickleweed (*Salicornia virginica*).

Disturbed Diegan coastal sage scrub may be characterized by low, woody subshrubs that grow to approximately 1m (3 feet) in height (Holland 1986). This vegetation type includes species found in undisturbed Diegan coastal sage scrub such as California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*), white sage (*Salvia apiana*), deerweed (*Lotus scoparius*) and lemonadeberry (*Rhus integrifolia*). However, disturbed Diegan coastal sage scrub includes a relatively large proportion of non-native, invasive species. In the project area, disturbed Diegan coastal sage scrub includes California buckwheat, California sagebrush, San Diego County viguiera (*Viguiera laciniata*), tree tobacco (*Nicotiana glauca*), Bermuda grass (*Cynodon dactylon*), Russian thistle (*Salsola tragus*), California encelia (*Encelia californica*), deerweed, black sage (*Salvia mellifera*), goldenbush (*Isocoma menziesii*), yellow sweetclover, garland (*Chrysanthemum coronarium*), and sweet fennel (*Foeniculum vulgare*). Small, monotypic stands of Palmer sagewort (*Artemisia palmeri*) and white sage (*Salvia apiana*) were also designated as disturbed Diegan coastal sage scrub due to their isolation from contiguous patches of this habitat. This vegetation community was observed in the project area along El Camino Real Road and San Dieguito Road.

Ruderal habitat includes areas that have been previously graded or subject to some other form of disturbance that has allowed the invasion of non-native grasses and other invasive annual plant species. Non-native grasses comprise approximately 20% of the species observed in ruderal habitat. Species associated with ruderal habitat in the project alignment include castor bean (*Ricinus communis*), tree tobacco, purple star thistle (*Centaurea calcitrapa*), western ragweed, garland, tocalote (*Centaurea melitensis*), Russian thistle, telegraph weed (*Heterotheca grandiflora*), Hottentot fig (*Carpobrotus edulis*), and Canary Island Palm (*Phoenix canariensis*). Ruderal habitat in the project area also includes a stand of tamarisk located at the southern end of El Camino Real Road.

Ornamental vegetation in the project area consists primarily of planted acacia (*Acacia* sp.), gum tree (*Eucalyptus* sp.), ngaio (*Myoporum laetum*) and various cultivated grasses. Other species associated with ornamental vegetation include western ragweed, saltgrass, ripgut grass (*Bromus diandrus*), mugwort (*Artemisia douglasiana*) and evergreen pear (*Pyrus kawakamii*).

Zoology

This section discusses wildlife species that were observed or have potential to occur along the proposed project alignment. As shown in Figures 3a, b, and c, much of the habitat consists of disturbed, ruderal and ornamental vegetation or developed areas. Few wildlife species are expected to occur in these areas. However, higher quality habitat does occur along and within the San Dieguito River channel. Wildlife species that were observed from the project site are summarized in Attachment B.

Bird species observed during the surveys include song sparrow (*Melospiza melodia*), California quail (*Callipepla californica*), Say's phoebe (*Sayornis saya*), killdeer (*Charadrius vociferus*), American coot (*Fulica americana*), cliff swallow (*Petrochelidon pyrrhonota*), black phoebe (*Sayornis nigricans*), common yellowthroat (*Geothlypis trichas*), marsh wren (*Cistothorus palustris*), northern rough-winged swallow (*Stelgidopteryx serripennis*), and rufous hummingbird (*Selasphorus rufus*). Most of the species observed on-site, though not considered sensitive as defined in Section 4.3, are protected under the Migratory Bird Treaty Act (MBTA; § 16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755). This federal statute prohibits, unless permitted by regulations, the pursuit, hunting, taking, capture, killing, possession, sale, purchase, transport or export of any migratory bird or any part, nest or egg of that bird. Several MBTA-protected birds including black phoebe, house finch and cliff swallow utilize the project area for nesting. Project compliance with the MBTA will be addressed in Section IX. Mitigation Measures.

Several sensitive bird species were detected during surveys of the project area. These include light-footed clapper rail (*Rallus longirostris levipes*), least Bell's vireo (*Vireo bellii pusillus*), American bittern (*Botaurus lentiginosus*), yellow warbler (*Dendroica petechia*), white-tailed kite (*Elanus leucurus*), Vaux's swift (*Chaetura vauxi*), white-faced ibis (*Plegadis chihi*) and northern harrier (*Circus cyaneus*). Of these, yellow warbler and light-footed clapper rail were observed nesting within the project alignment.

Mammal species that were detected on-site include Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Spermophilus beecheyi*) and Audubon's cottontail (*Sylvilagus audubonii*). The remnant brackish marsh habitat supports a population of crayfish (*Procambarus clarki*), at least on a seasonal basis. Although a focused bat survey was conducted, none were observed (Attachment C).

In addition to those wildlife species observed on-site, several sensitive species are considered to be potentially occurring on-site though not observed during surveys of the project area. These include: Quino checkerspot butterfly (*Euphydryas editha quino*), arroyo toad (*Bufo californicus*), Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), southwestern willow flycatcher (*Empidonax traillii extimus*) and Pacific pocket mouse (*Perognathus longimembris pacificus*).

These species and their likelihood of occurrence in the project area is discussed in greater detail in Section V. Important Biological Resources in the Project Area.

B. The Existing Level of Disturbance

As described above, the relatively large proportion of exotic species among native species indicates disturbance in vegetated areas. This section describes existing disturbance in the project area in terms of physical setting. Soils found in the project area also are described below.

Physical Setting

El Camino Real is located approximately 2 km (1.25) miles east of Interstate 5. It is accessible from the east and west from Via de la Valle and from the south from Del Mar Heights Road (Figure 2). The project alignment extends across the floodplain of the San Dieguito River and is generally flat with the exception of the river bed. The San Dieguito River channel east of the bridge is fortified with quarter ton rip rap while the channel west of the bridge consists of a sandy substrate.

Two constructed drainage channels parallel the project area. Both support disturbed and wetland vegetation. One drainage is located just south of Via de la Valle; another parallels the east side of El Camino Real Road. Another drainage parallels the north side of Via de la Valle and is located just outside of the project area.

Surrounding land uses north of the existing bridge include an equestrian center, commercial area, and recreational fields. South of the bridge, a golf course was recently constructed (in 2004) on the eastern side of the road and agricultural fields exist to the west.

Elevation along the alignment is approximately 6.1 m (20 feet) above mean sea level (MSL) but drops between 1.5 to 3 m (5 to 10 feet) from the existing roadbed to the adjacent habitat. Elevation at the San Dieguito River bottom is approximately 1.5 m (5 feet) above MSL.

Soils

Four soil series occur on the project site including the Tujunga series, the Grangeville series, the Huerohuero series, and the Corralitos series. According to Bowman et al. (1973), the Tujunga series consists of very deep, excessively drained sands. These soils are found on alluvial fans and flood plains and have slopes of 0 to 5 percent. Tujunga sand, 0 to 5 percent slopes (TuB), dominates the alluvial valley bottom of the project site.

The Grangeville series consists of somewhat poorly drained, very deep fine sandy loams. These soils are on alluvial fans and alluvial plains and have slopes 0 to 2 percent. Grangeville fine sandy loam (GoA) occurs in the northern portion of the project site.

The Huerohuero series consists of moderately well-drained loams that have a clay subsoil. They have slopes of 2 to 30 percent. Huerohuero loam, 15 to 30 percent slopes, eroded (HrE2) is moderately steep and occurs in the southernmost and southwestern portion of the project site.

The Corralitos series consists of somewhat excessively drained, very deep loamy sands. These soils are typically found in narrow valleys and on small alluvial fans. They have slopes of 0 to 15 percent. Corralitos loamy sand, 5 to 9 percent slopes (CsC) is moderately sloping and occurs in the southeasternmost portion of the project site.

V. IMPORTANT BIOLOGICAL RESOURCES IN THE PROJECT AREA

A. Sensitive Species Potentially Occurring in the Project Area

Plant and animal species are considered sensitive if they have been listed as such by federal or state resource agencies, or by special interest groups such as the California Native Plant Society (CNPS). The California Department of Fish and Game (CDFG) publishes comprehensive lists for sensitive plants and animals through the California Natural Diversity Database (CNDDB). The CDFG also publishes the CNDDB RareFind, a computerized inventory of information on the location and condition of California's rare, threatened, endangered, and sensitive plants, animals, and natural communities (CDFG 2003a).

Sensitive species include those species formally designated by the USFWS as Endangered, Threatened, Proposed Endangered or Threatened or Federal Species of Concern. Other sensitive species include species designated by the CDFG as Endangered, Threatened, Fully Protected or Species of Special Concern.

Table 6 addresses the potential occurrence of sensitive species reported by the CNDDB and includes sensitive species that were detected in the project area. Narrow endemic plant species identified by the City of San Diego, i.e., species restricted in range to San Diego County, also are included in Table 6. Of these species, suitable habitat may exist in the project area for federally endangered San Diego ambrosia (*Ambrosia pumila*), Orcutt's spineflower (*Chorizanthe orcuttiana*) and narrow

Table 6. Threatened, Endangered or Rare Species Potentially Occurring on the Proposed El Camino Real Road/Bridge Widening Project Site

Species	Status[1]	Habitat[2]	Presence/Description
Plants			
coastal dunes milk vetch (*Astragalus tener* var. *titi*)	federally endangered; state endangered; narrow endemic; MSCP-covered; List 1B	Moist, open areas such as coastal bluffs.	Not detected during field surveys. Not expected to occur due to the absence of moist, open habitat.
Orcutt's spineflower (*Chorizanthe orcuttiana*)	federally endangered; state endangered; List 1B	Sandy clay loam; associated with coastal scrub and chaparral.	Not detected during field surveys. Possible; appropriate habitat may exist within the project boundaries.
San Diego button celery (*Eryngium aristulatum* var. *parishii*)	federally endangered; state endangered; narrow endemic; MSCP-covered; List 1B	Coastal scrub, valley and foothill grassland, and vernal pools.	Not detected during field surveys. Unlikely; remnant and degraded coastal scrub exists within the project boundaries.
willowy monardella (*Monardella linoides* ssp. *viminea*)	federally endangered; state endangered; MSCP-covered; List 1B	Rocky washes in riparian forest, scrub or woodland, chaparral or closed-cone conifer forest.	Not detected during field surveys. Not expected to occur as this perennial species would have been detected if present. Furthermore, appropriate habitat does not exist on-site.
California Orcutt grass (*Orcuttia californica*)	federally endangered; state endangered; narrow endemic; MSCP-covered; List 1B	Vernal pools.	Not detected during field surveys. Not expected to occur due to the absence of vernal pool habitat within the project boundaries.
San Diego mesa mint (*Pogogyne abramsii*)	federally endangered; state endangered; narrow endemic; MSCP-covered; List 1B	Vernal pools.	Not detected during field surveys. Not expected to occur due to the absence of vernal pool habitat within the project boundaries.

Table 6 (continued). Threatened, Endangered or Rare Species Potentially Occurring on the Proposed El Camino Real Road/Bridge Widening Project Site

Species	Status[1]	Habitat[2]	Presence/Description
Otay Mesa mint (*Pogogyne nudiuscula*)	federally endangered; state endangered; narrow endemic; MSCP-covered; List 1B	Vernal pools.	Not detected during field surveys. Not expected to occur due to the absence of vernal pool habitat within the project boundaries.
San Diego thornmint (*Acanthomintha ilicifolia*)	federally threatened; state endangered; narrow endemic; MSCP-covered; List 1B	Openings in coastal scrub and chaparral; associated with vernal pools and/or clayey soils.	Not detected during field surveys. Unlikely; remnant and degraded coastal scrub exists within the project boundaries.
San Diego ambrosia (*Ambrosia pumila*)	federally endangered; no state status; narrow endemic; MSCP-covered; List 1B	Disturbed areas; chaparral, coastal scrub, valley foothill grasslands and vernal pools.	Not detected during field surveys. Not expected to occur as this perennial species would have been detected if present. However, appropriate habitat may exist on-site.
Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*)	federally endangered; no state status; MSCP-covered; List 1B	Maritime chaparral, sandy mesas and bluffs.	Not detected during field surveys. Not expected to occur as this shrubby species would have been detected if present. Furthermore, appropriate habitat does not exist on-site.
Encinitas baccharis (*Baccharis vanessae*)	federally threatened; state endangered; narrow endemic; MSCP-covered; List 1B	Chaparral.	Not detected during field surveys. Not expected to occur as this shrubby species would have been detected if present. Furthermore, appropriate habitat does not exist on-site.

Table 6 (continued). Threatened, Endangered or Rare Species Potentially Occurring on the Proposed El Camino Real Road/Bridge Widening Project Site

Species	Status[1]	Habitat[2]	Presence/Description
Otay tarplant (*Deinandra conjugens*)	federally threatened; state endangered; narrow endemic; MSCP-covered; List 1B	Clayey soils in coastal sage scrub and valley foothill grasslands.	Not detected during field surveys. Unlikely; the project area is not within the known range of this species and dominance of loamy and sandy soils in the project area.
spreading navarettia (*Navarettia fossalis*)	federally threatened; no state status; narrow endemic; MSCP-covered; List 1B	Chenopod scrub, shallow freshwater habitat; vernal pools.	Not detected during field surveys and not expected to occur due to the absence of appropriate habitat.
short-leaved dudleya (*Dudleya blochmaniae* ssp. *brevifolia*)	no federal status; state endangered; narrow endemic; MSCP-covered; List 1B	Bare sandstone terraces; chaparral and coastal scrub.	Not detected during field surveys and not expected to occur due to the absence of sandstone terraces within the project boundaries.
Shaw's agave (*Agave shawii*)	no federal status; no state status; narrow endemic; MSCP-covered; List 2	Coastal bluffs.	Not detected during field surveys. Not expected to occur on-site as this perennial, shrub-like species would have been detected if present. Furthermore, appropriate coastal bluff habitat does not exist on-site.
aphanisma (*Aphanisma blitoides*)	no federal status; no state status; narrow endemic; MSCP-covered; List 1B	Coastal bluff scrub, coastal dunes and sage scrub on sandy soils.	Not detected during field surveys. Possible; appropriate habitat may occur within the project boundaries.
Palmer's sagewort (*Artemisia palmeri*)	no federal status; no state status; List 4	Chaparral, coastal scrub, riparian scrub, riparian woodland; in sandy soils, or mesic conditions.	Detected during field surveys.
variegated dudleya (*Dudleya variegata*)	no federal status; no state status; narrow endemic; MSCP-covered; List 1B	Grassland, rocky slopes, open mesa tops and saline coastal strand; often associated with clayey soils.	Not detected during field surveys. Not expected to occur due to the absence of appropriate habitat.

Table 6 (continued). Threatened, Endangered or Rare Species Potentially Occurring on the Proposed El Camino Real Road/Bridge Widening Project Site

Species	Status[1]	Habitat[2]	Presence/Description
San Diego marsh elder (*Iva hayesiana*)	no federal status; no state status; List 2	Marshes and swamps, or playas.	Detected during field surveys.
snake cholla (*Opuntia californica* var. *californica*)	no state status; no federal status; narrow endemic; MSCP-covered; List 1B	Coastal bluffs below 150 meters.	Not detected during field surveys. Not expected to occur as this perennial species would have been detected if present. Furthermore, appropriate habitat does not exist on-site.
Wildlife			
Quino checkerspot butterfly (*Euphydryas editha quino*)	federally endangered; no state status	Foothills and coastal mesas; associated with larval hostplant dot-seeded plantain (*Plantago erecta*) and chinese houses (*Collinsia* sp.).	Not detected during surveys. Not expected to occur due to lack of appropriate habitat on-site.
San Diego fairy shrimp (*Branchinecta sandiegonensis*)	federally endangered; no state status; MSCP-covered	Vernal pools.	Not detected during field surveys. Not expected to occur due to the absence of vernal pool habitat.
arroyo toad (*Bufo californicus*)	federally endangered; state species of special concern; MSCP-covered	Rivers with shallow, gravelly pools undisturbed by currents, adjacent to sandy terraces.	Not detected during protocol surveys. Not expected to occur due to the absence of suitable habitat in project vicinity.
western spadefoot toad (*Spea hammondii*)	federal species of concern; state species of special concern	Gravelly areas such as alkali flats, marshes and river floodplains.	Not detected during field surveys. Possible; this species was observed downstream of the project area (Josselyn 1997). However, it is not expected to occur on-site due to the saline conditions in the project area.

Table 6 (continued). Threatened, Endangered or Rare Species Potentially Occurring on the Proposed El Camino Real Road/Bridge Widening Project Site

Species	Status[1]	Habitat[2]	Presence/Description
light-footed clapper rail (*Rallus longirostris levipes*)	federally endangered; state endangered and fully protected; MSCP-covered	Coastal salt marshes and brackish marshes.	Detected during protocol survey.
California least tern (*Sterna antillarum browni*)	federally endangered; state endangered and fully protected; MSCP-covered	Barrier dunes and mudflats, tidal channels, lagoons and nearshore waters.	Not detected during field surveys. Not expected to occur due to the absence of appropriate habitat within the project boundaries.
least Bell's vireo (*Vireo pusillus bellii*)	federally endangered; state endangered; MSCP-covered	Diverse riparian woodland; most in coastal lowland.	Detected in southern willow scrub habitat west of project area.
southwestern willow flycatcher (*Empidonax traillii extimus*)	federally endangered; no state status; MSCP-covered	Riparian habitat dominated by dense willow woodland.	Not detected during field surveys. Not expected to occur due to the patchy and degraded condition of willow scrub within the project boundaries.
Belding's savannah sparrow (*Passerculus sandwichensis beldingi*)	no federal status; state endangered; MSCP-covered	Salt marshes or lagoons in low vegetation dominated by pickleweed.	Not detected during focused surveys. Not expected to occur due to the suboptimal habitat conditions available on-site.
western snowy plover (*Charadrius alexandrinus nivosus*)	federally threatened; state species of special concern; MSCP-covered	Nests in beach dunes; sandy ocean beaches, margins of lagoons, tidal mudflats, dried mudflats; bare dirt dikes or fills.	Not detected during field surveys. Not expected to occur due to the absence of appropriate habitat within project boundaries.
coastal California gnatcatcher (*Polioptila californica californica*)	federally threatened; state species of special concern; MSCP-covered	Coastal sage scrub.	Not detected during field surveys. Not expected to occur due to the degraded condition of sage scrub on-site and isolation from areas of higher quality habitat.

Table 6 (continued). Threatened, Endangered or Rare Species Potentially Occurring on the Proposed El Camino Real Road/Bridge Widening Project Site

Species	Status[1]	Habitat[2]	Presence/Description
white-tailed kite (*Elanus leucurus*)	federal species of concern; state fully protected	Open groves, river valleys, marshes and grasslands.	Detected on-site.
American bittern (*Botaurus lentiginosus*)	federal species of concern	Coastal and inland marsh habitat	Detected on-site.
white-faced ibis (*Plegadis chihi*)	federal species of concern, state species of special concern; MSCP-covered	Fresh water ponds, irrigated fields and brackish lagoons.	Detected on-site.
Vaux's swift (*Chaetura vauxi*)	federal species of concern; state species of special concern	Coastal lowlands.	Detected on-site.
northern harrier (*Circus cyaneus*)	no federal status; state species of special concern; MSCP-covered	Grasslands, agricultural fields, coastal marshes.	Detected on-site.
yellow warbler (*Dendroica petechia*)	no federal status; state species of special concern	Riparian areas along streams and swamps.	Nesting on-site.
Pacific pocket mouse (*Perognathus longimembris pacificus*)	federally endangered; state species of special concern	Coastal strand, sand dunes, ruderal vegetation on river alluvium, and open coastal sage scrub on coastal terraces.	Not detected during field surveys. Not expected to occur due to the absence of appropriate habitat within the project boundaries as determined during habitat assessment conducted by USFWS.
Harbison's dun skipper (*Euphyes bestris harbisoni*)	federal species of concern; no state status	Riparian habitat supporting San Diego sedge (*Carex spissa*).	Not detected during field survey. Not expected to occur due to the absence of lavral host plant San Diego sedge.

[1] Status taken from California Department of Fish and Game (2003b and c) and CNPS 2003. Narrow Endemic = plants of limited distribution in San Diego County as defined by the City of San Diego Land Development Code (2001). [2] Habitat taken from Hickman (1993) and CNPS (2001) for plants; Scott (1987) and Unitt (1984) for birds.

endemic aphanisma (*Aphanisma blitoides*). The ecology for these species is discussed in greater detail in Part C. Special Status Plant Species.

As described in Section III. Study Methodology, numerous surveys were conducted in support of the proposed project. These included habitat assessments, focused surveys and protocol surveys for sensitive wildlife species both reported and not reported by the CNDDB as potentially occurring in the project area. Several species specific habitat evaluations were conducted in the project area at the request of the City of San Diego. Each of the species for which habitat assessments, focused surveys, or protocol surveys were conducted has been included in Table 6 and discussed in greater detail in Part D. Special Wildlife Species.

B. Important Natural Communities

Sensitive habitats include vegetation communities that are considered to be ecologically valuable because they are regionally uncommon or they function as habitat for rare plant or wildlife species. In the project area, disturbed Diegan coastal sage scrub is considered to be a sensitive habitat. This community is most commonly identified as potential habitat for the federally threatened California gnatcatcher. It is identified by the City of San Diego (2001) as a (Tier II) Uncommon Upland habitat.

Disturbed coastal brackish marsh, southern willow scrub, disturbed southern willow scrub and disturbed mule-fat scrub are considered sensitive wetland habitats by the City of San Diego (2001) and are also subject to jurisdiction by the U.S. Army Corps of Engineers (ACOE) pursuant to Section 404 of the Clean Water Act and the California Department of Fish and Game (CDFG) pursuant to Section 1601 of the Fish and Game Code. Permits issued by these agencies would be required prior to any construction activities.

C. Special Status Plant Species

<u>Palmer's sagewort</u>
Federal status: None
State status: None
CNPS List 4

Palmer's sagewort (*Artemisia palmeri*), a member of the Sunflower Family, occurring in mesic areas such as valleys, meadows, and drainages between 45 and 3,000 feet above mean sea level (CNPS 2001; Lightner 2006). This biennial/perennial species blooms between May and September and can be described as strongly scented and wand like. Typically the base of this plant is woody and the leaves are glabrous (Hickman 1993).

Palmer's sagewort was observed in the project area as monotypic patches associated with the San Dieguito River and the drainage adjacent to El Camino Real. Within the project footprint, Palmer's sagewort occurs as a small patch established on fill soils on the western shoulder of El Camino Real. This area will be impacted by the proposed project. This patch is roughly 10 feet by 8 feet in area.

Therefore, impacts to this plant species are not considered significant. This species has been included in the riparian scrub revegetation plant pallette, which is discussed in greater detail in Section IX. Mitigation Measures.

Aphanisma
Federal status: None
State status: None
Narrow Endemic
CNPS List 1B

Aphanisma (*Aphanisma blitoides*) is a member of the Chenopodiaceae, or goosefoot family. This annual plant is fleshy, glabrous with one to many stems growing from the base that grow to between 10 and 55 cm in height (Hickman 1993). Leaves on the lower portions of the plant are sessile while upper leaves are more or less clasping (Hickman 1993). The leaf shape is elliptical to ovate and leaves range between 8 and 40 mm in length.

This species is associated with coastal bluff scrub, coastal dunes and sage scrub on sandy soils. It is known to bloom between March and June. This species has been threatened by urbanization, recreational development and foot traffic. Aphanisma was not observed during surveys of the project area. Although this species could occur within disturbed coastal sage scrub, its presence is unlikely because that vegetation community is relatively limited in the project area.

San Diego Ambrosia
Federal status: Endangered
State status: None
Narrow Endemic
CNPS List 1B

San Diego ambrosia (*Ambrosia pumila*), a member of the Asteraceae, or sunflower family, is a perennial herb that expands by rhizomes and grows in height to approximately two *feet*. The stems are green to straw colored, with short, dense hairs. The leaves of this plant are softly gray-white and hairy. The flowers of San Diego ambrosia grow in staminate and pistillate heads that bloom between May and September. This species occurs in chaparral, coastal scrub, valley and foothill grassland, and vernal pools. It is also known to occur in disturbed sites. Many occurrences of this plant have been extirpated in San Diego, where it is threatened by continued development (CNPS 2001).

No San Diego ambrosia was detected during field surveys of the project site and is not expected to occur. However, disturbed Diegan coastal sage scrub exists in the project area and may serve as suitable habitat for this species.

Orcutt's spineflower
Federal Status: Endangered
State Status: Endangered
CNPS List 1B

Orcutt's spineflower (*Corizanthe orcuttiana*) is a member of the Polygonaceae or Buckwheat family. It is an annual herb with a prostrate stem that grows to between 1 and 15 centimeters in length (Hickman 1993). The leaf blade varies between 5 and 15 mm in length and is narrow with light hairs (Hickman 1993). This species produces yellow tubular flowers that bloom between March and May. This plant can be found in coastal chaparral openings in chamise with a distinctive loose sandy substrate. It occurs in Corralitos loamy sand, and loamy alluvial land in the Huerohuero complex (Reiser 1994). It is known from only three occurrences in Point Loma and Encinitas. Most of its historical habitat has been urbanized. This species is tbreatened by foot traffic (CNPS 2001).

This species was not observed during the biological survey. Despite the presence of suitable soils for the spineflower, chaparral vegetation does not exist in the project area. Furthermore, given the limited known range of this species, it is not likely that the spineflower occurs within the project alignment.

D. Special Status Wildlife Species

Quino Checkerspot Butterfly
Federal Status: Endangered
State Status: None

The Quino checkerspot butterfly (*Euphydryas editha quino*) is known to occur in sunny openings within chaparral and coastal sage shrublands in portions of Riverside and San Diego counties, California, and northwestern Baja California, Mexico (Federal Register 1997). This species has been threatened by habitat loss and degradation as a result of grazing, urban development, fire management, excessive collection and general human disturbance (Federal Register 1997).

The checkerspot's primary larval hostplant, dot-seed plantain (*Plantago erecta*), is generally small, growing to between approximately 3 and 30 centimeters in height (Hickman 1993). It is easily displaced by non-native species that invade following disturbance from discing, grading or grazing (Federal Register 1997). Other known larval host plants include Chinese houses (*Collinsia concolor*), snapdragon (*Antirrhinum coulterianum*) and Indian paint brush (*Castilleja exserta*) (USFWS 1999).

In addition to specific larval host plant requirements, the Quino checkerspot is also associated with particular topographic features. It is known to prefer open or bare soils with moderate to heavy clay content or cryptogamic crusts (USFWS 1999). Ridges, rounded hilltops and generally, topographic diversity indicates suitable Quino habitat.

The proposed project area was evaluated to determine the presence or absence of suitable Quino habitat. None of the habitat conditions associated with the Quino checkerspot butterfly were observed in the project area. Thus, this species is not expected to occur within the proposed project boundaries. The habitat assessment report is provided in Attachment D. An updated habitat assessment conducted in 2005 also indicated that no suitable habitat for this species exists in the project area (Attachment D).

Arroyo Toad
Federal Status: Endangered
State Status: Species of Special Concern

The arroyo toad (*Bufo californicus*) is a federally-endangered amphibian that inhabits riparian habitats of the southwestern United States. The arroyo toad is small (5-8 cm), light greenish-gray or tan with warty skin and dark spots. Its underside is buff-colored and often without spots.

Optimal habitat for the arroyo toad consists of rivers that have shallow, gravelly pools adjacent to sandy terraces. Breeding for the arroyo southwestern toad takes place in large streams and occurs between late March and mid-June. Eggs are deposited and larvae develop in shallow pools with silty gravel/sand substrate that are relatively undisturbed by currents and have little emergent vegetation (Federal Register 1994). The toad requires shallow, slow-moving water for laying eggs. Sparsely vegetated sand or gravel terraces adjacent to streams having a closed canopy of cottonwoods or willows overhead are required for metamorphosing and foraging juveniles and adults. During the mating season, the adult males vocalize at night from mating pools to attract females. The courtship vocalization is a distinctive high trill that lasts for 8 to 10 seconds. It is during mating season that surveys for vocalizing males can be conducted to determine presence or absence at a given site.

The arroyo toad currently restricted to small, isolated populations in various parts of southern California and Baja California. Factors contributing to the decline of the arroyo toad include dam construction, artificial flow regulation and off-road vehicle activities.

Protocol surveys of the arroyo toad were conducted by Tierra in Spring 1998 and 1999 (Attachment E). No evidence of adult, juvenile or larval arroyo toad were detected during these surveys. The brackish conditions of the project area and the dense brackish marsh habitat would not provide arroyo toad breeding habitat. Therefore, this species is not expected to occur on-site.

Biological surveys conducted in 2003 indicate that the project area remains unsuitable to support this species. The river channel is dominated by brackish marsh rather than the freshwater conditions preferred by the arroyo toad. The project area lacks shallow pools on silty/sandy substrate adjacent to sparsely vegetated upland preferred by breeding arroyo toad. As stated previously, the USFWS has determined that additional surveys for this species will not be required (pers. comm. Oct. 13, 2004).

Coastal California Gnatcatcher
Federal Status: Threatened
State Status: Species of Special Concern

The coastal California gnatcatcher (*Polioptila californica californica*) is a small gray songbird that resides in coastal sage scrub plant communities. It is a recognized subspecies of the California gnatcatcher (*Polioptila californica*) which has a greater geographical distribution. The coastal California gnatcatcher is endemic to coastal southern California and northwestern Baja California, Mexico. The present distribution of the subspecies includes Los Angeles, Orange, Riverside, and San Diego counties. The southern limit of the coastal California gnatcatcher coincides with the distributional limit of coastal sage scrub.

The gnatcatcher occupies coastal sage scrub plant communities dominated by California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), various species of sage (*Salvia* spp.), California encelia (*Encelia californica*), and various species of cactus as well as intermixed elements of chaparral communities such as laurel sumac (*Malosma laurina*) and common chamise (*Adenostoma fasciculatum*). Within the overall range of suitable habitat, patches dominated by California sagebrush and California buckwheat are preferred over communities with a greater percent composition of sage, chamise or other sage scrub elements. Gnatcatcher population declines have been attributed to coastal sage scrub habitat destruction, fragmentation and modification. Degradation of approximately 90% of suitable habitat has occurred as a result of urban and agricultural development prior to the early 1980's (Westman 1981, 1987; Barbour and Major 1977).

Coastal California gnatcatcher was not observed within the project area. Although Diegan coastal sage scrub occurs on-site, it occurs as small patches and narrow bands adjacent to developed areas. This species is not expected to occur on-site due to the poor quality of habitat on-site.

Light-Footed Clapper Rail
Federal status: Endangered
State status: Endangered and Fully Protected

The light-footed clapper rail (*Rallus longirostris levipes*), a member of the Rallidae family of birds, is a year-round resident of coastal salt marshes of the west coast (Unitt 1984). Often referred to as a "marsh hen" because of its resemblance to a chicken, the light-footed clapper rail is a large tan and gray bird with a slightly decurved bill, barred flanks and a short upturned tail, which it flicks nervously (Peterson 1990). Nests are built in the coastal salt marshes they inhabit. Optimal nesting habitat consists of monotypic stands of Pacific cordgrass (*Spartina foliosa*) that the clapper rail uses to obscure its nest from view. The decline of the light-footed clapper rail has been directly attributed to the destruction of the salt marsh habitat that it requires.

A single advertising light-footed clapper rail was detected during each of three focused surveys conducted by Konecny Biological Services in March 2001. These surveys were conducted in support of the Northbound Interstate 5 Auxiliary Lane Expansion between Del Mar Heights Road and Via de la Valle proposed by Caltrans. The area surveyed included the San Dieguito River from the Interstate 5 bridge to the El Camino Real bridge and the entire periphery of the southern freshwater marsh/open water area. In addition, eight survey stations were established in the project area. Survey methods and locations of survey stations are depicted in the focused survey report provided as Attachment F.

Historically, light-footed clapper rail have been known to occur in the El Camino Road and Bridge Widening project vicinity. This species has been detected east of Interstate 5 during 6 of the last 20 years of focused surveys for the clapper rail (Konecny 2001).

During a habitat assessment conducted by B. Haas of Varanus Biological Services in May 2004, between 5 and 8 pairs of light-footed clapper rail were detected aurally. A subsequent survey conducted by D. Zembal, J. Konecny and B. Haas utilized audio-tape to elicit vocalizations and determined that approximately 5 pairs and 7 territories exist in the project area. These populations are considered to be conservative estimates as the survey was conducted midday and audio tape playback was used sparingly to avoid unnecessary disturbance to this species during its breeding season. Locations of light-footed clapper rail detected during the 2004 surveys are provided in Figure 4. The results of the updated habitat assessment and survey for the clapper rail is provided as Attachment J.

A focused census survey of the project area was conducted by D. Zembal and S. Hoffman on March 31, 2005 (L. Lucas 2005, pers. comm.). The survey area extended from the Mogan Run Golf Course to the eastern edge of the El Camino Real. A total of 7 pairs, 6 males, and 13 single rails were detected. The population size was estimated at 12 pairs. The results of the protocol survey for the clapper rail is provided as Attachment K.

A third focused survey for this species was conducted within the San Dieguito River in April of 2006. A total of 31-36 pairs, including 4-5 pairs west of the El Camino Real Bridge, were detected (J. Konecny pers. com).

A total of 350 pairs of light-footed clapper rails exhibiting breeding behavior were detected in 15 southern California marshes in the 2004 annual survey (Zembal et. al 2004). Subpopulations in Upper Newport Bay and Tijuana Estuary supported a combined total of 252 pairs, or 72% of the state total. No individual numbers were given for these two sites; however, in the 2003 survey there were 144 pairs at Upper Newport Bay and 64 pairs at Tijuana Estuary, a ratio of 2.25 to 1 (Zembal and Hoffman 2003). Point Mugu supported the next largest population in the state with 19 pairs, followed by Seal beach (16 pairs) and Kendall-Frost Reserve in Mission bay (14 pairs). Thus, the discovery of up to 36 pairs of clapper rails at the El Camino Real bridge site is of biological significance.

The physical and biological characteristics of the El Camino Real bridge site are unique in terms of supporting breeding light-footed clapper rails. While clapper rails have been known to utilize freshwater and brackish water marshes for breeding and foraging, their preferred breeding habitat is intertidal salt marsh dominated by California cordgrass (*Spartina foliosa*). The combination of shallow, slow-moving water, and dense vegetation adjacent to open pools have created an area of brackish marsh that is apparently ideal for the clapper rail. The shallow, slow-moving water provides conditions favorable to aquatic prey organisms and the establishment and persistence of emergent vegetation. The dense emergent vegetation provides cover for this secretive species, while the open pools provide foraging habitat immediately adjacent to cover. These characteristics occur from just west of the El Camino Real bridge to well upstream of the bridge. Thus, the clapper rails are concentrated in the project area and to the east of the project area.

Given the distribution of clapper rails in the project area (See Attachment K), the area of suitable habitat may be nearing carrying capacity. Construction activities may result in one or more pairs of rails abandoning their territory. Rails that attempt to move to a new site within the project area may be repelled by other pairs defending their established territory(s). Rails that are forced into suboptimal sites may be subject to predation or competition for resources. The recent survey of the site indicates that the clapper rails in the project area occur east of the bridge. Thus, any alternative that is located east of the existing bridge could potentially impact the breeding and foraging of this species.

The presence of a substantial population of breeding light-footed clapper rails within the confined banks of the San Dieguito River would suggest an exposure to predators due to the linear nature of the habitat and high degree of edge effect. The fact that this population appears to be thriving indicates that predation is not a limiting factor. This may be due to the fact that there are few residences in the area that might harbor unnatural predators, such as house cats, and the dense cover of the brackish marsh habitat that offers cover from natural predators, such as mammals and birds of prey.

Informal consultation with the USFWS and CDFG regarding the light-footed clapper rail is underway. It is anticipated that these agencies will require further assessment and documentation of potential project impacts to this fully protected species.

<u>Least Bell's Vireo</u>
Federal Status: Endangered
State Status: Endangered

The least Bell's vireo (*Vireo bellii pusillus*) is a small, olive-gray songbird that nests and forages almost exclusively in riparian woodland habitats. Nesting habitat typically consists of riparian woodland with well-developed overstories, understories and low densities of aquatic and herbaceous cover. The understory often consists of dense thickets composed of narrow-leaved willow (*Salix exigua*), mule-fat (*Baccharis salicifolia*), and saplings of arroyo willow (*Salix lasiolepis*), Goodding's black willow (*Salix gooddingii*) or one of several possible herbaceous species.

The population decline of the least Bell's vireo has been attributed to the destruction of riparian habitats and to brood-parasitism by the brown-headed cowbird (*Molothus ater*). As a result of brood-parasitism, vireos have been known to abandon nests or to raise cowbird chicks instead of their own (Unitt 1984).

No vireo were detected in the southern willow scrub habitat during eight protocol surveys conducted in 2002 (Attachment G). As described previously, southern willow scrub on-site would be considered disturbed. It occurs within the drainage on the eastern side of the site and is linear, remnant and isolated from larger areas of similar habitat. Least Bell's vireo require dense willow habitat for breeding. Thus, this vegetation would not be considered suitable to support nesting least Bell's vireo.

An updated habitat assessment was conducted in the project area in 2004. Although limited suitable habitat is reported from the project area, two least Bell's vireo territories were occupied at the time of the survey. One territory supported a solitary adult male; the second territory supported a pair. Locations of least Bell's vireo detected during the 2004 surveys are provided in Figure 4. Results of this habitat assessment are included in Attachment J.

Belding's Savannah Sparrow
Federal status: None
State status: Endangered

The Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) is a member of the Emberizidae family and a year-round resident of Southern California . It is a small brown songbird with dark brown breast streaks, a notched tail, whitish stripe on the crown of the head, and yellow eyebrow stripes (Peterson 1990). The Belding's savannah sparrow nests and forages almost exclusively in the coastal salt marsh environment dominated by pickleweed (*Salicornia virginica*). Nests are usually built in natural depressions in the ground and are concealed by overhanging vegetation (Ehrlich 1988).

Coastal development has greatly reduced the usable habitat available for the Belding's savannah sparrow (Unitt 1984). This species was not detected during surveys of the project area and none are expected to occur due to suboptimal habitat conditions available onsite.

An updated habitat assessment for this species was conducted in 2004. No Belding's savannah sparrow were observed at that time and suitable habitat remains limited. Results of this survey are included in Attachment J. Recommendations made in the habitat assessment report included conducting pre-construction surveys for this species.

Southwestern Willow Flycatcher
Federal status: Endangered
State status: None

The southwestern willow flycatcher (*Empidonax traillii extimus*) is a small (approximately 15 cm in length), insectivorous bird. The overall appearance of this species is greenish or brownish gray above, with a white throat that contrasts with a pale olive breast and pale yellow body. The flycatcher is one of four willow flycatcher subspecies and can be distinguished from other willow flycatchers by its distinct "fitz-bew" song (Yard and Brown 2000). It nests and forages in riparian habitats typically dominated by dense willow (*Salix* sp.) understory (Federal Register 1993). Other plant species characterizing appropriate flycatcher habitat include mule-fat (*Baccharis salicifolia*), arrow weed (*Pluchea sericea*), coast live oak (*Quercus agrifolia*) and scattered cottonwoods (*Populus fremontii*).

The historic breeding range of the southwestern willow flycatcher includes southern California, Arizona, New Mexico, extreme southern portions of Nevada and Utah, and western Texas. Currently, the southwestern willow flycatcher is declining in most states where it was historically found. The species was proposed for federal endangered status in July 1993.

Like least Bell's vireo, this species requires dense willow habitat for breeding. The patchy and degraded willow scrub on-site would be considered unsuitable to support nesting southwestern willow flycatcher. An updated habitat assessment for this species was conducted in 2004. No habitat suitable to support this species was observed in the project area. Results of this habitat assessment are included in Attachment J.

American Bittern
Federal Status: Species of Concern
State Status: None

The American Bittern (*Botarus lentiginosus*) is a large, cryptically colored, secretive bird that inhabits marsh habitats (Sibley 2000). This migratory bird species is 28 inches in height, has a wingspan of 42 inches and brown plumage with bold brown stripes on the neck and breast (Sibley 2000). In San Diego County, this species has become rare winter and summer visitor (Unitt 2004).

B. Haas detected an advertising male American bittern east of the El Camino Real Bridge during an avian habitat assessment conducted in May of 2004 (Attachment J). Although a nest was not observed, appropriate breeding habitat for this species occurs on-site. Construction activities would avoid the nesting season for this species. Therefore, direct impacts to the American bittern are not anticipated.

Yellow Warbler
Federal Status: None
State Status: California Special Concern Species

The yellow warbler is a fairly stout but long-bodied bird with a relatively short tail and a stout bill (Sibley 2000). This warbler species is five inches long and has a wingspan of eight inches. As its name suggests, the body and head of the yellow warbler are yellow. During the breeding season, the male has reddish streaks on the breast. In San Diego County, this migratory bird is a fairly common breeding summer resident and a rare but annual winter visitor that can be found in riparian habitat (Unitt 2004).

A pair of yellow warblers were observed nesting in riparian habitat east of the El Camino Real Bridge and within the project footprint. Although project construction would result in impacts to yellow warbler breeding habitat, construction activities would avoid the nesting season of this migratory bird species. Therefore, direct impacts to yellow warbler are not anticipated.

<u>Pacific Pocket Mouse</u>
Federal status: Endangered
State status: Species of Special Concern

The Pacific pocket mouse (*Perognathus longimembris pacificus*) occurs in areas of sandy soil with sparse vegetative cover (Montgomery 1995). It is a member of the rodent family Heteromyidae which includes primarily seed-eating kangaroo rats, kangaroo mice and pocket mice. The pocket mouse is the smallest of its genus with a combined body and tail length of 120 mm and weight ranging from 6 to 10 grams.

Specific habitats for the Pacific pocket mouse include coastal strand, sand dunes, ruderal vegetation on river alluvium and open coastal sage scrub on coastal terraces. The preferred habitat of the species appears to be scattered vegetation on sand-dominated substrate, specifically coastal sage scrub vegetation occurring on predominantly sandy soils. However, the pocket mouse has been known to occur in various other vegetation types such as weedy fields, dune habitats and vernal pools.

The historic range of the Pacific pocket mouse extends along the coast from Tijuana River area northward to Los Angeles County. Its distribution has been restricted however, probably due to extensive habitat loss resulting from development and off-road vehicle activities.

In February 1999, Tierra requested that the USFWS perform a habitat assessment to determine the suitability of the El Camino Real site for this species (Attachment H). A habitat assessment was conducted by M. Pavelka of the USFWS shortly after that request. Subsequently, Mr. Pavelka verbally reported that the area was not suitable for this species.

<u>Harbison's Dun Skipper</u>
Federal Status: Species of Concern
State Status: None

The Harbison's dun skipper (*Euphyes vestris harbisoni*) is an endemic subspecies that occurs in scattered and fragmented colonies throughout western San Diego County. This subspecies is restricted to riparian areas such as intermittent streams and oak woodlands where its larval host plant San Diego sedge (*Carex spisa*) is present.

Harbison's dun skipper was not detected during biological surveys. This species is not expected to occur on-site due to the absence of its larval host plant San Diego sedge. Therefore, impacts to this subspecies are not anticipated.

VI. IN DEPTH STUDIES FOR SPECIAL LAWS

A. Biological Assessment

Two federally and state endangered species were detected in the project area: light-footed clapper rail and least Bell's vireo. Preconstruction surveys may be required to verify the presence or absence of least Bell's vireo in the project area. If it is determined that the project "may affect" this species, a formal consultation will be required pursuant to Section 7 of the Federal Endangered Species Act and Section 2080 of the State Endangered Species Act.

B. Wetlands Assessment

The ACOE currently requires that wetland delineations be performed using the 1987 Wetland Delineation Manual (ACOE 1987). The 1987 manual delineates wetlands based on three parameters: the prevalence of hydrophytic vegetation; the presence of hydric soils; and the presence of wetland hydrology. Hydrophytic vegetation refers to "water-loving" or wetland indicator plants. Wetland plants are classified as obligate or facultative based on their requirements for wetland conditions during their life cycles (Reed 1988). Obligate (OBL) wetland plants require wetland conditions, at least saturated soils, during periods in their life cycle to survive. Facultative (FAC) wetland plants prefer wet or moist conditions; however, depending on the species, may be found in wetlands, uplands or transitional areas. Facultative species have been further described to include a range of preference from upland to wetland conditions as facultative upland (FACU), facultative (FAC), and facultative wetland (FACW). Hydrophytic vegetation is considered to be prevalent in an area if more than 50 percent of the dominant species are OBL, FACW, or FAC.

Hydric soils are soils that are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (ACOE 1987). Such soils generally develop indicators of anaerobic conditions, such as reduced regions in the soil profile. The U.S. Natural Resources Conservation Service (formerly U.S. Soil Conservation Service) has published a list of soils that qualify as hydric soils (USDA 1992).

Wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Wetland hydrology can be obvious or subtle. Surface saturation is an obvious indication, as is free water in a pit excavated to examine soils. Less obvious indicators include water marks or water-stained leaves.

The 1987 ACOE Manual includes two methods for determining wetland boundaries: the routine method and the comprehensive method. The routine delineation method usually involves a field visit where existing conditions are observed and indicators of wetland vegetation, hydric soils and wetland hydrology are noted and mapped on an aerial photograph or facsimile, such as an orthotopographic photograph. The comprehensive delineation method involves the analysis of vegetation, soils, and hydrology along a number of transects, randomly distributed along a main transect that parallels the project. For this project, the routine method of wetland delineation, described below, was used.

A black and white aerial photograph of the site (1" = 50") was used as a reference and for mapping the wetland boundary. Observation points were established in areas that appeared to represent a shift in habitat from wetland to upland. At each observation point, the following data were recorded:

- Dominant plant species by type. Herbs, shrubs and saplings recorded within a 5-foot radius of the observation point; trees within a 30-ft radius.

- Soil characteristics demonstrated by a soil pit excavated to a depth exceeding 16 inches.

- Evidence of wetland hydrology as indicated by visual examination of the surface and soil strata.

Prior to the field survey, U.S. Department of Agriculture Soil Conservation Service maps for the project area were reviewed. A total of 10 detailed observation points were analyzed for the project. The data sheets for these determinations are provided in Attachment I.

ACOE jurisdiction also includes Waters of the U.S., specifically water bodies. For streams, this jurisdiction extends to the upper limits of the ordinary high water (OHW) mark indicated by marks on the channel banks, debris and other indicators. In situations where a stream is confined to a clearly incised channel, determination of OHW is fairly straight forward. In cases where the floodplain is characterized by a series of meandering braided channels, OHW may be difficult to determine. The CDFG and the City of San Diego employ less restrictive definitions of wetlands. Both claim jurisdiction over areas that exhibit any one of the three wetland indicators discussed above. In the El Camino Real Road/Bridge Widening project area, ACOE, CDFG and City of San Diego jurisdictional habitats are equal as these habitats are contained within clearly defined channel banks. Jurisdictional wetlands include southern willow scrub, disturbed southern willow scrub, disturbed mule-fat scrub, disturbed coastal brackish marsh and disturbed southern coastal salt marsh. At the request of the City, an updated wetland delineation was performed in 2004. Results of this delineation indicate that the conditions of the project area have not changed. Jurisdictional habitat occurs within well-defined channels, including that of the San Dieguito River and the previously mentioned drainage channels. Jurisdictional habitats are the same as previously delineated.

C. Evaluation of Resources/Conformance with City of San Diego Multiple Species Conservation Program and Other Regional Plans

Evaluation of Resources

The proposed alignment supports a variety of habitats that vary in ecological value. Along the San Dieguito River channel, southern willow scrub, disturbed southern willow scrub, disturbed mule-fat scrub and disturbed coastal brackish marsh would be considered of moderate to high ecological value. On the east side of El Camino Real, vegetation has established on a riprap substrate. Although various species not typically associated with riparian habitats comprise the understory, herbaceous species growing densely beneath mule-fat and willow dominants provide the structural heterogeneity necessary to support a diverse wildlife population. Disturbed coastal brackish marsh also includes exotic elements. Nevertheless, all three vegetation communities comprise a contiguous band of habitat along the river and therefore function as part of a regional, east/west-trending wildlife corridor. Furthermore, as stated previously in this document, federally and state-endangered species such as least Bell's vireo and light-footed clapper rail are known to utilize the wetland habitats in the project area.

It is likely that direct and indirect impacts from construction activities will disrupt current use of this portion of the San Dieguito River channel as a wildlife corridor. However, this disruption will be temporary as construction activities will be restricted to the non-breeding season of sensitive bird species and to daylight hours. In addition, all construction equipment will be removed from the river channel at the end of each day. Also, no staging areas or storage of equipment or material will occur within the river channel. Therefore, the San Dieguito River will function as a wildlife corridor without interruption during the breeding season (February 15 through September 15) and in the night during construction in the non-breeding season (September 16 through February 14). Disturbed portions of the channel will be revegetated and wildlife will be able to move freely through the area once the project is completed.

Although they may provide foraging ground or perching sites for raptor species including federal species of concern white-tailed kite (*Elanus leucurus*) and northern harrier (*Circus cyaneus*) observed during surveys of the project area, ruderal and ornamental areas provide limited habitat value. Rather, such habitats are more likely to support primarily species commonly associated with urban or disturbed settings. Remnant patches of disturbed Diegan coastal sage scrub would be considered to be of low ecological value. These areas are small and isolated from other areas of sage scrub habitat.

Similarly, patches of disturbed southern willow scrub and disturbed coastal brackish marsh located along El Camino Real and Via de la Valle would be considered to be of low ecological value. These habitats are surrounded by either ruderal or ornamental vegetation or developed land. It is unlikely that these isolated pieces of disturbed wetland vegetation would serve as suitable habitat for sensitive plant or wildlife species. None were observed in these areas during repeated surveys of the project alignment.

Multiple Species Conservation Program

The MSCP is a conservation program designed to facilitate the implementation of a regional habitat preserve by coordinating project impacts and mitigation while allowing the issuance of "take" permits for sensitive upland species at the local level (City of San Diego 1997). This habitat preserve is known as the Multi-Habitat Preserve Area (MHPA) and lands within it have been designated for conservation. Various jurisdictions, including the City of San Diego, have developed

MSCP Subarea plans to establish guidelines for the implementation of their respective preserve areas which are included in the regional MHPA.

In addition to general guidelines and directives provided in the City's MSCP subarea plan, development in the City of San Diego is subject to restrictions discussed in the City of San Diego Land Development Code Biology Guidelines (2001). These guidelines have been prepared to ensure the consideration of environmentally sensitive lands located in the vicinity of proposed development.

The MHPA established within the City boundaries delineates core biological areas and corridors targeted for conservation. Limited development is allowed within the MHPA (City of San Diego 1997). The proposed project alignment lies partially within the Northern Area of the Multi-Habitat Preserve Area (MHPA) established by the City's subarea plan (Figures 3a, b and c).

The subarea plan includes one specific MHPA guideline that directly addresses improvements to El Camino Real Road and bridge. It requires that once funding becomes available, a culvert be constructed for wildlife movement where El Camino Real crosses the outlet of Gonzales Canyon into the San Dieguito River. The proposed project area is located north of the portion of El Camino Real that crosses Gonzales Canyon. Consequently, a culvert for wildlife movement will not be included in the project design.

Habitat disturbance resulting from project construction would be subject to restrictions discussed in the City of San Diego Land Development Code Biology Guidelines (2001). These guidelines have been prepared to ensure the consideration of environmentally sensitive lands located in the vicinity of proposed development. The following guidelines apply to the proposed project:

1. Impacts to wetland areas are to be avoided if possible. Where impacts are unavoidable, mitigation would be proposed at specified ratios and would be consistent with the ACOE policy of "no net loss" of wetlands. Unavoidable impacts include those that allow reasonable use of essential public facilities such as essential roads, sewer and water lines where no feasible alternative exists.

   The proposed project will result in unavoidable impacts to wetland habitats as defined by the City of San Diego. Although six alternatives have been developed for this project, some impacts to wetlands are necessary in order to widen El Camino Real Road and replace the bridge to maintain its function as an essential roadway for area circulation. As a result, mitigation will be provided at a 3:1 or 4:1 ratio per the mitigation ratios established in the City's Land Development Code Biology Guidelines (2001), including 1:1 to 3:1 creation of wetland habitat. The remaining mitigation will be accomplished through habitat creation and enhancement. Mitigation for unavoidable impacts to wetlands is discussed in detail in Section VIII.

2. A wetland buffer must be maintained around all wetlands as appropriate to protect the functions and values of the wetland. In the coastal zone, a minimum 100-foot buffer is required.

As described above, the proposed project involves improvement and maintenance of an essential public facility. While the proposed project alternatives avoid wetlands to the extent possible and mitigation is proposed where necessary to achieve "no-net-loss" of wetlands, the linear nature of El Camino Real Road and Bridge precludes the maintenance of a wetland buffer between the proposed widened road and bridge and wetlands associated with the San Dieguito River. Currently, there is no wetland buffer between the existing bridge and wetland habitat associated with the San Dieguito River. The proposed bridge would be higher and consist of fewer pilings than the existing bridge, thereby improving the river's function as a wildlife corridor.

3. Within the MHPA, development must be located on the least sensitive portion of the site and designed to avoid covered species where feasible.

As described above, disturbed Diegan coastal sage scrub located within the project occurs in small, isolated patches and would be considered to be of low ecological value. Ruderal and ornamental vegetation, as well as disturbed and developed areas also would be considered to be of low ecological value. In general, the portions of the MHPA located within the project alignment would not be considered sensitive. Nevertheless, mitigation would be provided for project impacts to disturbed Diegan coastal sage scrub.

Although the San Dieguito River and associated wetlands also are considered sensitive habitats, impacts to such areas are unavoidable due to the nature of the project i.e. widening the bridge as it crosses the San Dieguito River. However, mitigation in the form of habitat creation, restoration and enhancement is proposed to offset project impacts to such sensitive areas. This is discussed further in Section IX. Mitigation Measures.

Additional requirements of the MSCP program that apply to the proposed project are found in Section 1.4 of the City of San Diego subarea plan which describes acceptable land uses planned or existing adjacent to the MHPA. The proposed road widening and bridge replacement is an essential public facility. According to the Framework Plan for the project area, El Camino Real is designated a four-lane major roadway (City of San Diego 1995). The proposed project would conform to the following land use guidelines provided in the subarea plan and thus will be considered a land use compatible with the goals of the MSCP. Where mitigation is required for MSCP conformance, specific measures to be implemented upon project construction are described in detail in Section IX. Additional Mitigation Measures.

1. Temporary construction areas and roads, staging areas, or permanent access roads must not disturb existing habitat unless determined to be unavoidable. If temporary habitat disturbance is unavoidable, then restoration of, and/or mitigation for, the disturbed area after project completion will be required.

Information provided in this report will assist in the selection of a construction alternative that will avoid existing habitat, particularly those considered to be sensitive, to the extent possible. Mitigation in the form of creation, restoration or enhancement will be provided for any impacts to sensitive habitats resulting from the proposed project.

For all alternatives and phases of construction, staging is planned at the southern end of the project area, just northeast of the junction of El Camino Real Road and San Dieguito Road. This area is located outside of the wildlife corridor associated with the San Dieguito River Channel. Much of the vegetation in this area has been characterized as ruderal; however, a small patch of Diegan coastal sage scrub occurs inside of the staging area. Temporary construction fencing and silt fencing will be installed around the perimeter of the staging area for the duration of construction to ensure that habitats adjacent to the project area are not impacted and to contain sediment. In addition, the small patch of Diegan coastal sage scrub occurring inside of the staging area will be fenced and protected. Therefore, use of staging areas will not result in impacts to sensitive biological resources.

All access related to project construction will be attained through areas that have been previously disturbed or already impacted by project components. Additional access roads will not be necessary.

2. Construction and maintenance activities in wildlife corridors must avoid significant disruption of corridor usage. Training of construction crews and field workers must be conducted.

The proposed project will require temporary disruption of wildlife movement in the vicinity of El Camino Real bridge. However, construction will be restricted during the light-footed clapper rail nesting season (February 15 to September 15), which also includes the least Bell's vireo nesting season. Outside of the nesting season, construction activities will occur during daylight hours such that wildlife use of the San Dieguito River corridor may continue to some extent. In addition, all construction equipment will be removed from the wildlife corridor at the end of each construction day. Also, staging areas and storage areas for equipment and materials will be located outside of the river channel. The project will provide adequate traffic control signage but none will interfere with the wildlife corridor. Temporary construction lighting has not been proposed as part of the project. Training of construction crews and field workers by a qualified biologist will be provided in order to avoid unnecessary impacts to biological resources in the area. Specific issues to be addressed during such pre-construction training is described in Section IX. C. Additional Mitigation Measures.

3. Roads in the MHPA will be limited to those identified in Community Plan Circulation Elements, collector streets essential for area circulation, and necessary maintenance/emergency access roads. Local streets should not cross the MHPA except where needed to access isolated development areas.

The proposed project is considered a four-lane major roadway essential for area circulation and, therefore, is compatible with the MSCP. The road is currently existing. The proposed project involves widening the road and bridge from 23 feet to up to 122 feet in order to accommodate additional travel lanes and, depending on the alternative chosen, various proposed features such as a bicycle lane and pedestrian walkway.

4. Where possible, roads within the MHPA should be narrowed from existing design standards to minimize habitat fragmentation and disruption of wildlife movement and breeding areas. Roads must be located in lower quality habitat or disturbed areas to the extent possible.

   The proposed project will result in a wider bridge crossing the San Dieguito River. However, the bridge will be higher with fewer pilings creating an improved buffer.

   For the eastern alignment alternative only, the exiting bridge would be returned to the JPA and vacated by the City for non-vehicular use as a trail. This will avoid additional disruption of the wildlife movement and breeding areas associated with demolition of the bridge.

5. Fencing or other barriers will be used where it is determined to be the best method to achieve conservation goals and adjacent to land uses incompatible with the MHPA. For example, use chain link or cattle wire to direct wildlife to appropriate corridor crossings, natural rocks/boulders or split rail fencing to direct public access to appropriate locations, and chain link to provide added protection of certain sensitive species or habitats (e.g. vernal pools).

   At both ends of the widened roadway and bridge, white, wood-faced fencing will be erected to direct pedestrian and bicycle traffic north and south along the paved road and away from the river bed.

6. Lighting shall be designed to avoid intrusion into the MHPA and effects on wildlife.

   Permanent lighting in areas of wildlife crossings will consist of low-sodium lighting as described in Section IX. C. Additional Mitigation Measures.

7. Signage will be limited to access and litter control and educational purposes.

   Signage erected along the project alignment will be only for the purposes of education, and access and litter control.

8. Prohibit the storage of material (e.g. hazardous or toxic, chemicals, equipment, etc.) within the MHPA and ensure appropriate storage per applicable regulations in any areas that may impact the MHPA, especially due to potential leakage.

   As presented earlier, for all alternatives and phases of construction, staging is planned at the southern end of the project area, just northeast of the junction of El Camino Real Road and San Dieguito Road. This area is located outside of the MHPA and wildlife corridor associated with the San Dieguito River Channel. A small patch of Diegan coastal sage scrub occurs within the staging area. Temporary construction fencing will be installed around this small patch to ensure its protection. The remaining vegetation has been characterized as ruderal and would not be considered biologically valuable. Therefore, impacts to sensitive habitats will not occur as a result of staging area use.

9. Flood control should generally be limited to existing agreements with Resource Agencies unless demonstrated to be needed based on a cost benefit analysis and pursuant to a restoration plan. Floodplains within the MHPA, and upstream from the MHPA if feasible, should remain in a natural condition and configuration in order to allow for ecological, geological, hydrological and other natural processes to remain or be restored.

   The proposed project will not create the need for flood control measures. No increase in flood elevations over the predicted 100-year water surface elevation is anticipated. This is discussed in greater detail in Section 3.7 of the Environmental Impact Report (EIR).

10. No berming, channelization, or man-made constraints or barriers to creek, tributary, or river flows should be allowed in any floodplain within the MHPA unless reviewed by all appropriate agencies, and adequately mitigated.

    Stabilization of the north bank of the San Dieguito River would be accomplished according to methods described in Section 3.7, Mitigation Measure 7-1 in the EIR. This measure includes placing buried rip-rap in an excavated bank separated from the existing habitat so that wetlands are not disturbed by construction. See Figure 3.7-5 in the EIR for a similar installation that was placed upstream. No man-made constraints to the flows associated with the San Dieguito River will be implemented.

11. No riprap, concrete, or other unnatural material shall be used to stabilize river, creek, tributary, and channel banks within the MHPA. River, stream, and channel banks shall be natural, and stabilized where necessary with willows and other appropriate native plantings. Rock gabions may be used where necessary to dissipate flows and should incorporate design features to ensure wildlife movement.

    Rip-rap will be used under the proposed bridge because these areas will be too steep to vegetate naturally. It has been determined that 100-year flood velocities with the proposed project would be the same as predicted for existing conditions. With the exception of bank stabilization described in #10 above, additional channel stabilization will not be included as part of the proposed project. Mitigation for impacts associated with the proposed bridge are described in Section IX.

Because a portion of the alignment is located outside of the MHPA, the following land use adjacency guidelines also apply to the proposed project. These guidelines address drainage, lighting, noise, invasives, and grading/land development implications and are discussed below.

1. All new proposed parking lots and developed areas in and adjacent to the preserve must not drain directly into the MHPA. All developed and paved areas must prevent the release of

toxins, chemicals, petroleum products, exotic plant materials, and other elements that might degrade or harm the natural environment or ecosystem processes within the MHPA. This can be accomplished using a variety of methods including natural detention basins, grass swales or mechanical trapping devices. These system should be maintained approximately once a year or as often as needed, to ensure proper functioning.

The created drainage ditches along the El Camino Real and Via De La Valle will provide for the treatment of runoff from paved areas, filtering fuel, oils and metals before runoff enters the San Dieguito River. These ditches would be vegetated with wetland species and would serve as natural grass swales to provide water treatment via uptake of pollutants in plant materials. Exotic plants would be controlled in the restored wetland areas by periodic maintenance focused on hand clearing of undesirable vegetation as described in Section IX. C. Additional Mitigation Measures.

2. Lighting of developed areas should be directed away from the MHPA. When necessary, lighting system should be shielded with non-invasive plant materials, berming, and/or other methods to protect the MHPA and sensitive species from night lighting.

Permanent lighting associated with the proposed road widening and bridge replacement will be directed down and away from the MHPA. This is described in Section IX. C. Additional Mitigation Measures. Construction activities will be conducted during the daytime. Therefore, temporary lighting will not be installed.

3. Uses in or adjacent to the MHPA should be designed to minimize noise impacts. Berms or walls should be constructed adjacent to commercial areas, recreational areas and any other use that may introduce noises that could impact or interfere with wildlife utilization of the MHPA.

The proposed project would not generate traffic, and would not create new uses in or adjacent to the MHPA that would generate noise. The widened roadway would reduce congestion along the existing road, and allow for greater vehicle speeds. Noise issues are addressed in the EIR/EA.

However, due to the presence of federal and state endangered least Bell's vireo and light-footed clapper rail, mitigation will be proposed to offset indirect impacts to these species from construction and operational noise. Construction will be restricted during the nesting season (February 15 to September 1). Although remnant Diegan coastal sage scrub exists in the project area, it is unlikely that these isolated patches provide habitat for the federally threatened California gnatcatcher and none were observed during surveys of the project area. Gnatcatcher preconstruction surveys will be conducted. If gnatcatchers occur within the project area, construction activity will not be allowed during the breeding season (March 1 16 through August 15). Therefore, impacts to this species will be avoided.

Outside of the nesting season, construction activities will occur during daylight hours such that wildlife use of the San Dieguito River corridor may continue to some extent. Training of construction crews and field workers by a qualified biologist will be provided in order to avoid unnecessary impacts to biological resources in the area. Specific mitigation measures to be implemented in order to minimize indirect noise impacts are described in Section IX. C. Additional Mitigation Measures.

4. No invasive non-native plant species shall be introduced into areas adjacent to the MHPA (City of San Diego 1997).

   Any proposed landscaping associated with the final project design will utilize native plant species. Proposed planting palettes for created wetlands along the San Dieguito River include only native species (please refer to Section IX. Mitigation Measures). No non-native species will be introduced into the project area or the MHPA.

5. New development adjacent to the MHPA may be required to provide barriers (e.g. non-invasive vegetation, rocks/boulders, fences, walls, and/or signage) along the MHPA boundaries to direct public access to appropriate locations and reduce domestic animal predation.

   Barriers, specifically white, wood-faced fencing, will be provided along the newly constructed road and bridge to direct the public and associated domestic animals away from the MHPA.

6. Manufactured slopes associated with site development shall be included within the development footprint for projects within or adjacent to the MHPA.

   All manufactured slopes associated with the proposed road and bridge are considered direct and permanent project impacts. These areas of impact have been quantified in Tables 7a-d as "Road Alignment" or "Bridge Footprint".

MSCP-Covered Species. Covered species are those that are considered adequately protected within the City of San Diego provided that they are conserved according to the conditions of coverage provided in the City's MSCP Subarea plan. Of the sensitive species detected in the project area (please refer to Table 6), light-footed clapper rail, Belding's savannah sparrow, least Bell's vireo, white-faced ibis and northern harrier are considered covered by the MSCP. Thus, project compliance with the MSCP would require conformance to the following conditions of coverage:

<u>Light-footed Clapper Rail.</u> This species is considered covered by the MSCP because 93% of its potential habitat, including southern coastal salt marsh, will be preserved. Wetland regulations that require no-net-loss of wetlands will provide additional protection for this species. The proposed project conforms to the conditions of coverage established for this species as proposed mitigation will result in no-net-loss of wetlands. In the project area, potential light-footed clapper rail habitat consists of disturbed coastal brackish marsh. To offset anticipated project impacts to this habitat,

coastal brackish marsh will be restored, created or enhanced at a 4:1 ratio. Mitigation will be accomplished within the San Dieguito River watershed. The proposed mitigation site and conceptual revegetation are discussed further in Section IX Mitigation Measures.

Least Bell's Vireo. This species is considered covered by the MSCP because 81% of its potential habitat, including riparian woodland and oak riparian forest, will be preserved. Wetland regulations that require no-net-loss of wetlands will provide additional protection for this species. The proposed project conforms to the conditions of coverage established for this species as proposed mitigation will result in no-net-loss of wetlands. Mitigation for anticipated project impacts to riparian scrub habitats will be provided at a 3:1 ratio through habitat restoration, creation and enhancement in the project vicinity.

White-faced Ibis. This species is considered covered by the MSCP because 78% of its potential habitat, including freshwater marsh, natural flood channel and agricultural land, will be preserved. Wetland regulations provide additional protection for this species by requiring no-net-loss of wetlands from proposed development. The proposed project conforms with these conditions of coverage. No impacts to freshwater marsh or agricultural land are anticipated from the proposed project. As described above, 4:1 mitigation will be provided for project impacts to brackish marsh in San Dieguito River channel.

Northern Harrier. This species is considered covered by the MSCP because 42% of its potential habitat, including salt marsh, freshwater marsh and grasslands, will be preserved. No impacts to freshwater marsh or grasslands are anticipated from the proposed project. Impacts to disturbed southern coastal salt marsh and disturbed coastal brackish marsh may affect the harrier which is associated with freshwater and salt water habitats. Nevertheless, the project conforms to MSCP conditions of coverage because mitigation for such habitats will be provided in the form of wetland restoration, creation and enhancement within the San Dieguito River watershed. Mitigation will be accomplished at a 4:1 ratio thereby resulting in no-net-loss of these wetland habitats.

Other Regional Plans

In addition to the City of San Diego MSCP, the proposed project was designed to conform with several plans that pertain specifically to the management of the San Dieguito River Valley. Each of these plans is described below. Figure 5 provides an overview of the areas included in each plan relative to the proposed project.

San Dieguito River Park Concept Plan

The proposed project alignment occurs within the focused planning area (FPA) of the San Dieguito River Park. Several documents pertaining to the long-range plans for the river park have been prepared. In 1994, the San Dieguito River Park Concept Plan was adopted to establish the goals for the future of the San Dieguito River Valley and to develop a planning framework for future park implementation (San Dieguito River Park Joint Powers Authority (JPA) 1994).

With regard to improvements to existing public facilities such as El Camino Real Road and Bridge, the concept plan indicates that these activities should be permitted within the FPA. Improvements must, however, be installed in a manner that minimizes environmental impacts, complies with the California Environmental Quality Act (CEQA), avoids impacts to existing and proposed park amenities, and is compatible with the objectives listed below:

- preservation of open space
- conservation of sensitive resources
- protection of water resources
- preservation of the natural floodplain
- retention of agricultural uses
- creation of recreational and educational opportunities (San Dieguito River Park JPA 1994).

In general, the proposed project will conform to these objectives. For each of the alternatives, sensitive species and habitats have been avoided to the extent possible. All alternatives facilitate the creation of recreational and educational opportunities, specifically the creation of public access via pedestrian walkways or bike lanes. Unavoidable impacts will be mitigated as required by the City of San Diego. However, the extent to which impacts to sensitive species or habitats are required will vary depending on the alternative chosen. These impacts are evaluated in Section VII Project Impacts.

San Dieguito Wetland Restoration Project

The San Dieguito Wetland Restoration Project also is located in the vicinity of the proposed El Camino Road and Bridge Widening. Specifically, this project involves restoration of wetland areas west of El Camino Real (Figure 5). Thus, it is possible that wetland restoration, creation or enhancement proposed as mitigation for the road and bridge widening could be coordinated with restoration efforts already planned for this watershed.

This project was proposed by Southern California Edison in 2000 in order to mitigate for impacts related to the San Onofre Nuclear Generating System (SONGS) project. A joint EIR/EIS (San Dieguito River Park JPA/USFWS 2000) was prepared to evaluate potential restoration project effects. Several alternative approaches to restoring this area are proposed in the EIR/EIS. However, the preferred alternative identified in that document is known as the Mixed Habitat Alternative (San Dieguito River Park JPA/USFWS 2000).

The major components of the preferred alternative include:

- excavation and long-term maintenance of the tidal inlet to maintain tidal exchange
- excavation of up to 247 acres of the site to create/restore coastal wetlands, associated uplands, nesting areas and required river berms.
- construction of three berms adjacent to the San Dieguito River to maintain the existing flood flows and river sediment transport to the ocean

- creation of four nesting site and rehabilitation of another nesting site to provide 13.7 acres of nesting habitat suitable for least tern and snowy plover
- placement of berms, weir, slope protection
- design and implementation of public access and interpretive plan (Kimley-Horn and Associates Inc. 2003).

Therefore, once completed, the San Dieguito Wetland Restoration Project would result in impacts to wetlands as a result of converting one type of wetland to another or as a result of proposed project components. Overall, project implementation would contribute to the total acreage of wetlands existing in the project vicinity.

San Dieguito River Valley Regional Open Space Park Master Plan

The joint EIR/EIS for the San Dieguito Wetland Restoration Project also describes the San Dieguito River Park Master Plan that encompasses the entire restoration project area and was prepared in accordance with the JPA Park Concept Plan. The primary objective of the Master Plan is to convert, to the extent feasible, previously filled or otherwise disturbed areas within the planning boundaries to habitat types that were historically found in and around the San Dieguito Lagoon. This conversion would involve restoring and maintaining tidal influence to existing wetlands, excavating additional areas to recreate tidal wetlands, restoring freshwater drainages and facilitating the growth of southern willow scrub habitat, vegetating disturbed agricultural fields to appropriate upland habitats and removing exotic invasives from natural areas (San Dieguito River Park JPA/USFWS 2000).

The Master Plan involves the restoration of tidal wetlands including mudflats, coastal salt marsh, seasonal salt marsh and transitional wetlands as described in the San Dieguito River Wetland Restoration Plan, as well as freshwater and upland habitat restoration. In addition, the Park Master Plan includes a proposal to construct the western segment of the Coast to Crest trail, two nature/interpretive trails and a nature center.

As mitigation for SONGS-related impacts, the Wetland Restoration Plan proposes to implement all of the tidal wetland restoration associated with the JPA Park Master Plan. Implementation of the planned non-tidal and upland restoration, however, would require grant funding or other sources. Non-tidal and upland restoration would involve the creation or enhancement of additional vegetation communities including: seasonal/transitional marsh, freshwater marsh, brackish marsh, Diegan coastal sage scrub, native grassland, chaparral, and riparian habitats. Public access and interpretive components of the plan also would require other funding sources.

Thus, the proposed El Camino Road and Bridge Widening project conforms conceptually with the objectives of the JPA Park Concept Plan, San Dieguito Wetland Restoration Project, and the JPA Park Master Plan in that each of these projects involve wetland restoration, creation, enhancement and preservation. At this time, the former Boudreau property is being proposed as a mitigation site (please refer to Section IX. Mitigation Measures); the parcel is located within the San Dieguito River Valley and has been previously identified by the above-named plans as an area designated for future wetland restoration. The proposed project also will not conflict with the construction of park trails. It should be noted that construction schedules are not precisely known for these neighboring projects in the San Dieguito River Valley. Thus, the relationship between the proposed project and other planned improvements or construction phases cannot be determined at this time.

VII. PROJECT IMPACTS

This section presents the proposed project impacts in Tables 7a through 7d, followed by summaries of impacts to sensitive habitats inside or outside of clapper rail habitat or the coastal zone in Tables 8 and 9, respectively. Impacts associated with each alternative are illustrated in Figures 6, 7, 8 and 9. In order to simplify the presentation of impacts, alternatives with similar right-of-way requirements, and therefore similar project footprints and impacts to biological resources, are presented together. Mitigation proposed for project impacts is discussed in greater detail in Section IX.

Definition of Project Impact

All impacts discussed in this section are considered direct project impacts. Indirect impacts, such as those associated with construction or operational noise and lighting, will likely result from the proposed project. These impacts are difficult to quantify precisely. However, proposed mitigation to offset the effects of such impacts is discussed in Section IX Mitigation Measures.

Impacts of the project are encompassed within the impact footprint on Figures 6 through 9. The footprint includes areas permanently covered by project features (e.g., the bridge), and areas disturbed only during construction (construction easement). Permanent impacts occur in areas permanently altered or shaded as a result of constructed project features. Thus, impacts that result from construction of road and bridge structures would be considered permanent. These are presented in Tables 7a-d under the "Bridge Footprint" and "Road Alignment" project features. The area under the existing bridge was considered to be already impacted by shading and bridge piers, and was not included in the compilation of impact acreage for the proposed project. For all build alternatives, this area would continue to be shaded, whether by a new bridge in place of the existing bridge, or by the existing bridge in the case of the Eastern Alignment Alternative only.

For the purposes of this document, areas temporarily altered by project construction or excavation within the construction easement also are considered to be permanently impacted. These impacts are presented in Tables 7a-d under "Construction Corridor in San Dieguito River" and "Construction Corridor for Road Alignment." Such areas, including the construction easement located within the river channel, would be returned to their original condition following project completion. However, due to the temporal loss of these wetland habitats, impacts to these areas are considered to be permanent.

Construction access would be obtained through areas already considered impacted by the proposed project, i.e., the permanent project footprint, or construction easements. Thus, access roads are not considered separately in this analysis of project impacts.

Previously Impacted Areas Under Existing Bridge

It should be noted that the acreage of disturbed coastal brackish marsh under the existing bridge (0.24 acre) is not included in Tables 7a through 7d. This area is currently shaded by the existing bridge and is considered to be impacted. For all alternatives, this area of brackish marsh will remain shaded as the bridge is widened to the east, west or east and west of the existing bridge. For the purposes of this report, the 0.24 acre of coastal brackish marsh is not considered additional project impact.

Impacts in the MHPA or Coastal Overlay Zone

For certain vegetation types, the location of impact and proposed mitigation influences the mitigation ratio required. In accordance with the City of San Diego Land Development Guidelines, impacted upland habitats inside the MHPA require mitigation provided at a higher ratio if proposed outside the MHPA. However, a lower ratio is acceptable if mitigation is accomplished inside the MPHA. Thus, in the following tables, acreage of project impacts to Diegan coastal sage scrub are distinguished by location inside or outside of the MHPA. Mitigation for impacts to Diegan coastal sage scrub both in and out of the MHPA is discussed further in Section IX.

Similarly, impacts to riparian scrub (including mule-fat scrub, southern willow scrub and disturbed southern willow scrub) located inside of the Coastal Overlay Zone require mitigation at a higher ratio than impacts to riparian scrub located outside of the Coastal Overlay Zone. The eastern boundary of the Coastal Overlay Zone is defined by the eastern edge of the existing El Camino Real right-of-way (Figures 6-9). Furthermore, the City of San Diego requires that unavoidable impacts to wetlands inside the Coastal Overlay Zone be mitigated on-site, if possible. Otherwise, mitigation must occur inside of the Coastal Overlay Zone within the same watershed as the wetland impact. Although the location of impacts and mitigation relative to the coastal zone is relevant only for riparian scrub habitats, all project impacts to sensitive habitats have been distinguished in Table 9 by their location, inside or outside of the coastal zone. Mitigation for impacts to riparian scrub habitats in and out of the coastal zone will be accomplished inside of the coastal zone and is discussed further in Section IX.

Impacts to Sensitive Habitats

The proposed project would result in impacts to sensitive wetland habitats which include riparian scrubs: southern willow scrub, disturbed southern willow scrub, disturbed mule-fat scrub; and coastal wetlands: disturbed coastal brackish marsh and disturbed southern coastal salt marsh. Based on the acreages presented in Tables 7a-d and summarized in Table 8, Eastern Alignment Alternative would result in the greatest impacts to sensitive wetlands. However, the Central Alignment and the Lower Elevation Alternative would result in the greatest impact to potential clapper rail habitat. The Road Capacity and Bicycle Safety Alternatives would result in the fewest impacts to sensitive wetlands and the smallest impact to potential clapper rail habitat.

Table 7a. Anticipated Project Impacts Associated with the Central Alignment Alternative and Lower Elevation Alternative

Project Features	Vegetation Communities (hectare/acre)[1]										
	SWS	DSWS	DMFS	DCBM	DSCSM	DDCSS inside MHPA	DDCSS outside MHPA	RUD	DIST	ORN	DEV
Bridge Footprint	--/--	0.03/0.08	0.06/0.16	0.26/0.64	--/--	--/--	0.03/0.09	0.0/0.01	--/--	--/--	0.03/0.09
Construction Corridor in San Dieguito River	0.00/0.01	--/--	--/--	0.09/0.22	--/--	--/--	--/--	--/--	--/--	--/--	0.02/0.04
Road Alignment	0.01/0.03	0.03/0.07	0.12/0.3	0.66/1.63	0.13/0.33	0.16/0.4	0.2/0.49	1.0/2.46	0.55/1.36	0.34/0.83	1.64/4.05
Construction Corridor for Road Alignment	--/--	--/--	0.00/0.01	0.23/0.56	0.12/0.32	--/--	--/--	0.28/0.68	1.31/3.24	0.01/0.02	0.32/0.79

1 <u>City of San Diego Riparian Scrub includes</u>:

SWS	Southern Willow Scrub
DSWS	Disturbed Southern Willow Scrub
DMFS	Disturbed Mule-fat Scrub

<u>City of San Diego Uncommon Uplands</u>:

DDCSS	Disturbed Diegan Coastal Sage Scrub

<u>City of San Diego Coastal Wetlands includes</u>:

DCBM	Disturbed Coastal Brackish Marsh
DSCSM	Disturbed Southern Coastal Salt Marsh

<u>City of San Diego Other Uplands</u>:

DIST	Disturbed
ORN	Ornamental

DEV	Developed
RUD	Ruderal

Table 7b. Anticipated Project Impacts Associated with Road Capacity and Bicycle Safety Alternatives

Project Features	Vegetation Communities (hectare/acre)[1]										
	SWS	DSWS	DMFS	DCBM	DSCSM	DDCSS inside MHPA	DDCSS outside MHPA	RUD	DIST	ORN	DEV
Bridge Footprint	--/--	--/--	--/--	0.16/0.39	--/--	--/--	0.0/0.01	--/--	--/--	--/--	0.07/0.18
Construction Corridor in San Dieguito River	--/--	0.02/0.04	--/--	0.05/0.12	--/--	--/--	0.02/0.05	--/--	--/--	--/--	0.0/0.01
Road Alignment	0.01/0.03	0.01/0.03	0.08/0.18	0.48/1.16	0.06/0.16	0.16/0.41	0.16/0.41	0.79/1.94	0.41/1.01	0.01/0.02	0.37/0.91
Construction Corridor for Road Alignment	--/--	0.03/0.07	--/--	0.24/0.58	0.09/0.23	--/--	--/--	0.28/0.68	1.13/2.8	--/--	0.05/0.12

1 City of San Diego Riparian Scrub includes:

SWS	Southern Willow Scrub
DSWS	Disturbed Southern Willow Scrub
DMFS	Disturbed Mule-fat Scrub

City of San Diego Coastal Wetlands includes:

DCBM	Disturbed Coastal Brackish Marsh
DSCSM	Disturbed Southern Coastal Salt Marsh

DEV	Developed
RUD	Ruderal

City of San Diego Uncommon Uplands:

DDCSS	Disturbed Diegan Coastal Sage Scrub

City of San Diego Other Uplands:

DIST	Disturbed
ORN	Ornamental

Table 7c. Anticipated Project Impacts Associated with the Western Alignment Alternative

Project Features	Vegetation Communities (hectare/acre)[1]										
	SWS	DSWS	DMFS	DCBM	DSCSM	DDCSS inside MHPA	DDCSS outside MHPA	RUD	DIST	ORN	DEV
Bridge Footprint	--/--	--/--	--/--	0.2/0.49	--/--	--/--	0.0/0.01	--/--	--/--	--/--	0.1/0.26
Construction Corridor in San Dieguito River	--/--	0.01/0.03	--/--	0.06/0.14	--/--	--/--	0.02/0.05	--/--	--/--	--/--	0.0/0.01
Road Alignment	0.01/0.03	--/--	0.17/0.4	0.5/1.23	0.06/0.25	0.17/0.42	0.16/0.41	0.8/1.97	0.45/1.11	0.01/0.02	0.89/2.19
Construction Corridor for Road Alignment	--/--	0.03/0.07	--/--	0.23/0.58	0.09/0.14	--/--	--/--	0.28/0.68	1.18/2.92	--/--	0.05/0.12

[1] City of San Diego Riparian Scrub includes:

SWS	Southern Willow Scrub
DSWS	Disturbed Southern Willow Scrub
DMFS	Disturbed Mule-fat Scrub

City of San Diego Coastal Wetlands includes:

DCBM	Disturbed Coastal Brackish Marsh
DSCSM	Disturbed Southern Coastal Salt Marsh

DEV	Developed
RUD	Ruderal

City of San Diego Uncommon Uplands:

DDCSS	Disturbed Diegan Coastal Sage Scrub

City of San Diego Other Uplands:

DIST	Disturbed
ORN	Ornamental

Table 7d. Anticipated Project Impacts Associated with the Eastern Alignment Alternative

Project Features	**Vegetation Communities (hectare/acre)**[1]										
	SWS	DSWS	DMFS	DCBM	DSCSM	DDCSS inside MHPA	DDCSS outside MHPA	RUD	DIST	ORN	DEV
Bridge Footprint	--/--	0.03/0.1	0.09/0.23	0.2/0.5	--/--	0.06/0.16	--/--	0.04/0.09	0.01/0.03	--/--	0.0/0.01
Construction Corridor in San Dieguito River	0.0/0.01	--/--	0.07/0.17	0.11/0.27	--/--	--/--	0.00/0.01	--/--	--/--	--/--	0.01/0.03
Road Alignment	--/--	--/--	0.11/0.28	0.66/1.63	0.2/0.5	0.09/0.23	0.15/0.36	0.58/1.42	0.69/1.72	0.37/0.91	1.89/4.67
Construction Corridor for Road Alignment	--/--	0.0/0.01	0.02/0.06	0.23/0.56	0.09/0.25	--/--	0.00/0.01	0.41/1.0	1.15/2.83	0.05/0.12	0.2/0.51

[1]

City of San Diego Riparian Scrub includes:
SWS Southern Willow Scrub
DSWS Disturbed Southern Willow Scrub
DMFS Disturbed Mule-fat Scrub

City of San Diego Coastal Wetlands includes:
DCBM Disturbed Coastal Brackish Marsh
DSCSM Disturbed Southern Coastal Salt Marsh

DEV Developed
RUD Ruderal

City of San Diego Uncommon Uplands:
DDCSS Disturbed Diegan Coastal Sage Scrub

City of San Diego Other Uplands:
DIST Disturbed
ORN Ornamental

Table 8. Anticipated Impacts to Sensitive Habitats Relative to Light-Footed Clapper Rail Habitat

Vegetation Communities (hectare/acre)	Project Alternative											
	Central Alignment and Lower Elevation			Road Capacity and Bicycle Safety			Western Alignment			Eastern Alignment		
	Clapper Rail	Non-Clapper Rail	*Total*	Clapper Rail	Non-Clapper Rail	*Total*	Clapper Rail	Non-Clapper Rail	*Total*	Clapper Rail	Non-Clapper Rail	*Total*
City of San Diego Riparian Scrub												
Southern Willow Scrub	--	0.01/0.04	0.01/0.04	--	0.01/0.03	0.01/0.03	–	0.01/0.03	0.01/0.03	–	0.0/0.01	0.0/0.01
Disturbed Southern Willow Scrub	–	0.06/0.15	0.06/0.15	–	0.06/0.14	0.06/0.14	--	0.04/0.1	0.04/0.1	–	0.03/0.11	0.03/0.11
Disturbed Mule-fat Scrub	--	0.18/0.47	0.18/0.47	–	0.08/0.18	0.08/0.18	--	0.17/0.4	0.17/0.4	–	0.29/0.74	0.29/0.74
Riparian Scrub Total	–	*0.25/0.66*	*0.25/0.66*	–	*0.15/0.35*	*0.15/0.35*	--	*0.22/0.53*	*0.22/0.53*	–	*0.32/0.86*	*0.32/0.86*
City of San Diego Coastal Wetlands												
Disturbed Coastal Brackish Marsh	0.35/0.86	0.89/2.19	1.24/3.05	0.21/0.51	0.72/1.74	0.93/2.25	0.26/0.63	0.73/1.81	0.99/2.44	0.31/0.77	0.89/2.19	1.2/2.96
Disturbed Southern Coastal Salt Marsh	--	0.25/0.65	0.25/0.65	–	0.15/0.39	0.15/0.39	--	0.15/0.39	0.15/0.39	–	0.29/0.75	0.29/0.75
Coastal Wetland Total	*0.35/0.86*	*1.14/2.84*	*1.49/3.7*	*0.21/0.51*	*0.87/2.13*	*1.08/2.64*	*0.26/0.63*	*0.88/2.2*	*1.14/2.83*	***0.31/0.77***	***1.18/2.94***	***1.49/3.71***
Total Wetland Impact	0.35/0.86	1.39/3.5	**1.74/4.36**	0.21/0.51	1.02/2.48	**1.23/2.99**	0.26/0.63	1.1/2.73	**1.36/3.36**	0.31/0.77	1.5/3.8	**1.81/4.57**
Total Upland (Disturbed Diegan Coastal Sage Scrub) Impact	–	0.39/0.98	**0.39/0.98**	–	0.34/0.88	**0.34/0.88**	–	0.35/0.89	**0.35/0.89**	–	0.31/0.77	**0.31/0.77**

Table 9. Anticipated Impacts to Sensitive Habitats Relative to the Coastal Overlay Zone

Vegetation Communities (hectare/acre)	Project Alternative											
	Central Alignment and Lower Elevation			Road Capacity and Bicycle Safety			Western Alignment			Eastern Alignment		
	Coastal Zone	Non-Coastal Zone	*Total*	Coastal Zone	Non-Coastal Zone	*Total*	Coastal Zone	Non-Coastal Zone	*Total*	Coastal Zone	Non-Coastal Zone	*Total*
City of San Diego Riparian Scrub												
Southern Willow Scrub	0.01/0.03	0.0/0.01	0.01/0.04	0.01/0.03	--	0.01/0.03	0.01/0.03	--	0.01/0.03	--	0.0/0.01	0.0/0.01
Disturbed Southern Willow Scrub	0.06/0.15	--	0.06/0.15	0.01/0.03	0.05/0.11	0.06/0.14	--	0.04/0.1	0.04/0.1	0.03/0.1	0.0/0.01	0.03/0.11
Disturbed Mule-fat Scrub	0.18/0.47	–	0.18/0.47	0.08/0.18	--	0.08/0.18	0.17/0.4	–	0.17/0.4	0.2/0.51	0.09/0.23	0.29/0.74
Riparian Scrub Total	*0.25/0.65*	*0.0/0.01*	*0.25/0.66*	*0.1/0.24*	*0.05/0.11*	*0.15/0.35*	*0.18/0.43*	*0.04/0.1*	*0.22/0.53*	*0.23/0.61*	*0.09/0.25*	*0.32/0.86*
City of San Diego Coastal Wetlands												
Disturbed Coastal Brackish Marsh	0.26/0.64	0.98/2.41	1.24/3.05	0.16/0.39	0.77/1.86	0.93/2.25	0.2/0.49	0.79/1.95	0.99/2.44	0.25/0.62	0.95/2.34	1.2/2.96
Disturbed Southern Coastal Salt Marsh	–	0.25/0.65	0.25/0.65	--	0.15/0.39	0.15/0.39	–	0.15/0.39	0.15/0.39	--	0.29/0.75	0.29/0.75
Coastal Wetland Total	*0.26/0.64*	*1.23/3.06*	*1.49/3.7*	*0.16/0.39*	*0.92/2.25*	*1.08/2.64*	*0.2/0.49*	*0.94/2.34*	*1.14/2.83*	***0.25/0.62***	***1.24/3.09***	***1.49/3.71***
Total Wetland Impact	0.51/1.29	1.23/3.07	**1.74/4.36**	0.26/0.63	0.97/2.36	**1.23/2.99**	0.38/0.92	0.98/2.44	**1.36/3.36**	0.48/1.23	1.33/3.34	**1.81/4.57**
Total Upland (Disturbed Diegan Coastal Sage Scrub) Impact	0.18/0.44	0.21/0.54	**0.39/0.98**	0.33/0.82	0.01/0.06	**0.34/0.88**	0.07/0.19	0.28/0.7	**0.35/0.89**	0.24//0.61	0.06/0.16	**0.31/0.77**

The proposed project also would result in impacts to disturbed Diegan coastal sage scrub. This vegetation community is considered a Tier II Uncommon Upland habitat by the City of San Diego. Based on the acreages presented in Tables 7a-d and summarized in Table 8, the Central Alignment Alternative and the Lower Elevation Alternative would result in the greatest impacts to sensitive upland habitat. The Eastern Alignment Alternative would result in the fewest impacts to sensitive upland habitat.

Significance Determination for Impacts to Sensitive Habitat

Impacts to sensitive wetland habitats are considered significant but mitigable. Proposed mitigation to achieve no-net-loss of wetlands is discussed in Section IX.

Although the remnant Diegan coastal sage scrub habitat found in the project area would be considered of low ecological value as described in Section VI. C., a portion of the impacts to this habitat are located in the MHPA and thus considered significant but mitigable. Mitigation for impacts to this habitat type also is discussed further in Section IX.

Impacts to Sensitive Species

No impacts to sensitive plants are anticipated from the construction of the El Camino Real Road/Bridge Widening Project. Although potential habitat for Orcutt's spineflower, aphanisma and

San Diego ambrosia may occur on the project site, none were observed during repeated surveys of the project area. Thus, no sensitive plant species are expected to occur on-site.

Direct impacts to sensitive wildlife species also are not anticipated from the proposed project. However, indirect impacts to federally and state endangered least Bell's vireo and light-footed clapper rail will most likely result from project construction.

Three species considered California Species of Special Concern, Vaux's swift, northern harrier and white-faced ibis, also were observed in the project area. White-tailed kite and American bittern, two federal species of concern, were also observed on-site. Yellow warbler, also a California Species of Special Concern, was observed nesting in the project area. Construction activity will avoid the combined nesting season (February 15 through September 15) of all sensitive avian species. Therefore, impacts to bird species potentially nesting in the project area are not anticipated.

Significance Determination for Impacts to Sensitive Species

Potential indirect impacts to the sensitive wildlife species mentioned above would be considered significant but mitigable. As discussed in Section V, informal consultation with the wildlife agencies is underway in order to appropriately address potential project impacts and mitigation for indirect impacts to the state fully protected light-footed clapper rail. Proposed measures to mitigate for indirect project impacts during construction are discussed in Section IX.

VIII. CUMULATIVE IMPACTS

All Alternatives

Several projects are planned in the project vicinity or are currently under construction. These include the restoration of the Boudreau property located south of the San Dieguito River, directly west of El Camino Real. A golf course was recently constructed south of the river channel, directly east of El Camino Real. In addition, as described previously, Southern California Edison has developed the San Dieguito Wetland Restoration Project as mitigation for the San Onofre Nuclear Generating Station (SONGS). This project would involve restoration of wetlands to the west of the El Camino Real Road and Bridge Widening project area. As stated above, mitigation for the proposed project may be accomplished in association with the San Dieguito Wetland Restoration Project; however, the details of such an arrangement are currently being negotiated.

Biological Resources. Project conformance with the City of San Diego MSCP guidelines (City of San Diego 1997) and conditions of coverage ensures that no cumulative impacts to biological resources will occur as a result of the proposed project. The City's MSCP facilitates coordinated regional conservation of biological resources and mitigation for impacts within the City boundaries. Thus, it is not likely that the proposed project will result in cumulative impacts to the river channel or associated wildlife movement provided that it conforms with the City's MSCP.

Significance Determination for Cumulative Impacts

Although the proposed project will result in indirect impacts to the light-footed clapper rail, a species covered by the MSCP, the project is not expected to result in significant cumulative impacts. Most of the projects identified in the project vicinity involve restoration, enhancement and creation of wetland habitats. Although the schedules for these projects have not yet been finalized, it is likely that seasonal restrictions also will apply such that indirect noise impacts will be minimized in order to avoid disruption of the normal activities of the clapper rail and other wildlife species utilizing the wildlife corridor (San Dieguito River).

IX. MITIGATION MEASURES

The mitigation program was developed in coordination with the City and permitting agencies. Mitigation ratios are based on the sensitivity of the light-footed clapper rail, as recommended by the CDFG and USFWS in multi-agency coordination meetings held in 2005 (see Appendix C of the EIR). Mitigation for impacts to sensitive habitats and sensitive species has been proposed in accordance with the ESL regulations found in the City's Land Development Code. As required by the City of San Diego, proposed mitigation consists of three elements, presented below: 1) the Mitigation Element; 2) the Protection and Notice Element; and 3) the Management Element.

IX. A. Mitigation Element

Mitigation for Upland Habitats

As described previously, Diegan coastal sage scrub is considered a Tier II Uncommon Upland habitat (City of San Diego 2001). Because proposed mitigation will be accomplished through a contribution to the City's Habitat Acquisition Fund, mitigation is required at a 1:1 ratio regardless of the location of impact relative to the MHPA (City of San Diego 2001).

Mitigation for Wetland Habitats

Wetland habitats are not included in the City's ranking of sensitive habitat tiers. As described in Section VI. C., projects within the City of San Diego are required to avoid wetlands to the extent possible both in and out of the MHPA (City of San Diego 2001). Where wetlands cannot be avoided, impacts must be minimized and mitigation provided to offset these impacts. Mitigation for unavoidable impacts to sensitive wetland habitats will be accomplished by: 1) creating habitat of equal value in the vicinity of the project; 2) enhancing degraded wetland habitats in the project vicinity through the removal of exotic plant species; and, 3) restoring wetland areas impacted during construction to their pre-project condition. The City also requires that unavoidable wetland impacts within the Coastal Overlay Zone must be mitigated in the Coastal Overlay Zone (City of San Diego 2001).

Mitigation proposed for the El Camino Real Road and Bridge Widening project conforms with these City guidelines. Mitigation in the form of habitat creation and enhancement will be accomplished on a 75-acre property currently owned by the San Dieguito JPA. The proposed parcel is located adjacent to the project area and is within the Coastal Overlay Zone.

Construction corridors, defined as areas used for construction staging or access, will be returned to their pre-project conditions following project completion, thus providing 1:1 restoration. Nevertheless, impacts associated with temporary construction easements are considered direct, permanent impacts, and will be mitigated as such, due to the temporal disturbance associated with project construction. Consequently, additional off-site acreage will be provided as necessary to achieve 3:1 or 4:1 mitigation for riparian scrub or coastal wetland habitats, respectively.

Mitigation for Riparian Scrub Habitats

Riparian scrub habitats located in the Coastal Overlay Zone require mitigation at a 3:1 ratio while those located outside of the Coastal Overlay Zone require mitigation at a 2:1 ratio. For this project, mitigation for impacts to riparian scrub habitats including southern willow scrub, disturbed southern willow scrub and disturbed mule-fat scrub are proposed at a 3:1 ratio, regardless of their location relative to the Coastal Zone. Because required mitigation for southern willow scrub and disturbed southern willow scrub is the same, these two vegetation types will be referred to hereafter as southern willow scrub.

Mitigation for impacts to riparian scrub in the road and bridge construction corridor will be accomplished at a 3:1 ratio through 1:1 restoration in the river and 2:1 enhancement of degraded riparian habitat in the project vicinity. Impacts of the permanent footprint of the bridge and road will be accomplished at 3:1 ratio through 1:1 creation and 2:1 enhancement of similar habitat.

Mitigation for Coastal Wetland Habitats

Impacts to coastal wetlands, such as disturbed coastal brackish marsh and disturbed southern coastal salt marsh, require mitigation at a 4:1 ratio. In order to provide species-specific mitigation for impacts to potential light-footed clapper rail habitat, i.e., all coastal brackish marsh associated with the existing El Camino Real bridge, mitigation has been proposed at a 4:1 ratio for impacts associated with the bridge footprint and bridge construction corridor. All mitigation proposed for impacts in these areas will entail creation of clapper rail habitat at the chosen mitigation site.

Coastal wetland habitat not occupied by light footed clapper rail (including coastal brackish marsh and coastal salt marsh) impacted along the road alignment and the road construction corridor also will be mitigated at a 4:1 ratio. This could be accomplished through 1:1 creation and 3:1 enhancement of similar habitat. However, no sites for potential enhancement of coastal wetland habitat were found in the immediate project vicinity. Therefore, it is proposed to mitigate impacts to coastal wetlands not occupied by light-footed clapper rail through creation of similar habitat and out of kind creation of riparian scrub habitat at the selected mitigation site.

Proposed mitigation measures to offset impacts to sensitive habitats associated with each alternative are summarized in Tables 10a-10d. These tables present the proposed mitigation based solely on mitigation ratios. In reality, some proposed mitigation ratios can not be achieved. For example, there is not enough disturbed coastal brackish marsh in the project area to satisfy the proposed enhancement acreages. Detailed, site-specific mitigation measures that include creating additional habitat where enhancement cannot be achieved is presented for the Eastern Alignment alternative in Table 11.

Mitigation Site Selection

In order to identify a suitable location for project mitigation, the City of San Diego project team, including Hon Consulting Inc., Rick Engineering, Tierra Environmental Services, and City staff from Environmental Analysis, Parks and Recreation, Real Estate Assets and MSCP, considered a range of feasible sites. The selection process included developing 1) criteria for identifying potential sites, 2) a list of possible sites, and 3) criteria for evaluating these sites. The following describes this process by which the three proposed mitigation sites were selected.

Identification of Mitigation Site

Criteria used during the selection process for a mitigation site were developed according to City of San Diego mitigation requirements for project impacts, particularly impacts that occur within the Coastal Overlay Zone which extends from the eastern side of the El Camino Real right-of-way

Table 10a. Mitigation Needed - Central Alignment and Lower Elevation Alternatives

Vegetation Community	Impacts[1] (hectare/acre)	Mitigation Ratio[2]	Total Mitigation Required (hectare/acre)	Creation or Restoration (hectare/acre)	Enhancement (hectare/acre)
Central Alignment and Lower Elevation Alternatives					
Riparian Scrubs: Southern Willow Scrub, Disturbed Southern Willow Scrub and Disturbed Mule-fat Scrub	0.0/0.02 (road and bridge construction corridor)	3:1 including 1:1 restoration 2:1 enhancement	0.0/0.06	0.0/0.02 (restoration in river)	0.0/0.04 (enhancement)
	0.25/0.64 (bridge and road permanent footprint)	3:1 including 1:1 creation 2:1 enhancement	0.75/1.92	0.25/0.64 (creation)	0.5/1.28 (enhancement)
Disturbed Coastal Brackish Marsh with Clapper Rail	0.09/0.22 (bridge construction corridor)	4:1 including 1:1 restoration 3:1 creation	0.36/0.88	0.09/0.22 (restoration in river) 0.27/0.66 (creation)	–
	0.26/0.64 (bridge permanent footprint)	4:1 creation	1.04/2.56	1.04/2.56 (creation)	--
Disturbed Coastal Brackish Marsh without Clapper Rail	0.89/2.19 (road construction corridor and permanent footprint)	4:1 including 1:1 creation 3:1 enhancement	3.56/8.76	0.89/2.19 (creation)	2.67/6.57 (enhancement) Boudreau Parcel
Disturbed Southern Coastal Salt Marsh	0.25/0.65 (road construction corridor and permanent footprint)	4:1 including 1:1 creation 3:1 enhancement	1.0/2.6	0.25/0.65 (creation)	0.75/1.95 (enhancement) Boudreau Parcel
Disturbed Diegan Coastal Sage Scrub	0.39/0.98	1:1	0.39/0.98	–	0.39/0.98 (habitat acquisition fund)

[1]Construction corridor refers to the temporary construction easement for either the road or bridge, or both, as noted.
[2]Mitigation has been presented at a 3:1 ratio for impacts to riparian scrub both in and out of the Coastal Overlay Zone.

Table 10b. Mitigation Needed - Road Capacity and Bicycle Safety Alternatives

Vegetation Community	Impacts[1] (hectare/acre)	Mitigation Ratio[2]	Total Mitigation Required (hectare/acre)	Creation or Restoration (hectare/acre)	Enhancement (hectare/acre)
Road Capacity and Bicycle Safety Alternatives					
Riparian Scrubs: Southern Willow Scrub, Disturbed Southern Willow Scrub and Disturbed Mule-fat Scrub	0.05/0.11 (road and bridge construction corridor)	3:1 including 1:1 restoration 2:1 enhancement	0.15/0.33	0.05/0.11 (restoration in river)	0.1/0.22 (enhancement)
	0.1/0.24 (bridge and road permanent footprint)	3:1 including 1:1 creation 2:1 enhancement	0.3/0.72	0.1/0.24 (creation)	0.2/0.48 (enhancement)
Disturbed Coastal Brackish Marsh with Clapper Rail	0.05/0.12 (bridge construction corridor)	4:1 including 1:1 restoration 3:1 creation	0.2/0.48	0.05/0.12 (restoration in river) 0.15/0.36 (creation)	
	0.16/0.39 (bridge permanent footprint)	4:1 creation	0.64/1.56	0.64/1.56 (creation)	
Disturbed Coastal Brackish Marsh without Clapper Rail	0.72/1.74 (road construction corridor and permanent footprint)	4:1 including 1:1 creation 3:1 enhancement	2.88/6.96	0.72/1.74 (creation)	2.16/5.22 (enhancement) Boudreau Parcel
Disturbed Southern Coastal Salt Marsh	0.15/0.39 (road construction corridor and permanent footprint)	4:1 including 1:1 creation 3:1 enhancement	0.6/1.56	0.15/0.39 (creation)	0.45/1.17 (enhancement) Boudreau Parcel
Disturbed Diegan Coastal Sage Scrub	0.34/0.88	1:1	0.34/0.88	--	0.34/0.88 (habitat acquisition fund)

[1]Construction corridor refers to the temporary construction easement for either the road or bridge, or both, as noted.
[2]Mitigation has been presented at a 3:1 ratio for impacts to riparian scrub both in and out of the Coastal Overlay Zone.

Table 10c. Mitigation Needed - Western Alignment Alternative

Vegetation Community	Impacts [1] (hectare/acre)	Mitigation Ratio [2]	Total Mitigation Required (hectare/acre)	Creation or Restoration (hectare/acre)	Enhancement (hectare/acre)
Western Alignment Alternative					
Riparian Scrubs: Southern Willow Scrub, Disturbed Southern Willow Scrub and Disturbed Mule-fat Scrub	0.04/0.1 (road and bridge construction corridor)	3:1 including 1:1 restoration 2:1 enhancement	0.12/0.3	0.04/0.1 (restoration in river)	0.08/0.2 (enhancement)
	0.18/0.43 (bridge and road permanent footprint)	3:1 including 1:1 creation 2:1 enhancement	0.54/1.29	0.18/0.43 (creation)	0.36/0.86 (enhancement)
Disturbed Coastal Brackish Marsh with Clapper Rail	0.06/0.14 (bridge construction corridor)	4:1 including 1:1 restoration 3:1 creation	0.24/0.56	0.06/0.14 (restoration in river) 0.18/0.42 (creation)	–
	0.2/0.49 (bridge permanent footprint)	4:1 creation	0.8/1.96	0.8/1.96 (creation)	–
Disturbed Coastal Brackish Marsh without Clapper Rail	0.73/1.81 (road construction corridor and permanent footprint)	4:1 including 1:1 creation 3:1 enhancement	2.92/7.24	0.73/1.81 (creation)	2.19/5.43 (enhancement) Boudreau Parcel
Disturbed Southern Coastal Salt Marsh	0.15/0.39 (road construction corridor and permanent footprint)	4:1 including 1:1 creation 3:1 enhancement	0.6/1.56	0.15/0.39 (creation)	0.45/1.17 (enhancement) Boudreau Parcel
Disturbed Diegan Coastal Sage Scrub	0.35/0.89	1:1	0.35/0.89	–	0.35/0.89 (habitat acquisition fund)

[1]Construction corridor refers to the temporary construction easement for either the road or bridge, or both, as noted.
[2]Mitigation has been presented at a 3:1 ratio for impacts to riparian scrub both in and out of the Coastal Overlay Zone.

Table 10d. Mitigation Needed - Eastern Alignment Alternative

Vegetation Community	Impacts[1] (hectare/acre)	Mitigation Ratio[2]	Total Mitigation Required (hectare/acre)	Creation or Restoration (hectare/acre)	Enhancement (hectare/acre)
Eastern Alignment Alternative					
Riparian Scrubs: Southern Willow Scrub, Disturbed Southern Willow Scrub and Disturbed Mule-fat Scrub	0.09/0.25 (road and bridge construction corridor)	3:1 including 1:1 restoration 2:1 enhancement	0.27/0.75	0.09/0.25 (restoration in river)	0.18/0.5 (enhancement)
	0.23/0.61 (bridge and road permanent footprint)	3:1 including 1:1 creation 2:1 enhancement	0.69/1.83	0.23/0.61 (creation)	0.46/1.22 (enhancement)
Disturbed Coastal Brackish Marsh with Clapper Rail	0.11/0.27 (bridge construction corridor)	4:1 including 1:1 restoration 3:1 creation	0.44/1.08	0.11/0.27 (restoration in river) 0.33/0.81 (creation)	–
	0.2/0.5 (bridge permanent footprint)	4:1 creation	0.8/2.0	0.8/2.0 (creation)	--
Disturbed Coastal Brackish Marsh without Clapper Rail	0.89/2.19 (road construction corridor and permanent footprint)	4:1 including 1:1 creation 3:1 enhancement	3.56/8.76	0.89/2.19 (creation)	2.67/6.57 (enhancement)
Disturbed Southern Coastal Salt Marsh	0.29/0.75 (road construction corridor and permanent footprint)	4:1 including 1:1 creation 3:1 enhancement	1.16/3.0	0.29/0.75 (creation)	0.87/2.25 (enhancement)
Disturbed Diegan Coastal Sage Scrub	0.3/0.77	1:1	0.31/0.77	--	0.31/0.77 (habitat acquisition fund)

[1] Construction corridor refers to the temporary construction easement for either the road or bridge, or both, as noted.
[2] Mitigation has been presented at a 3:1 ratio for impacts to riparian scrub both in and out of the Coastal Overlay Zone.

Table 11. Proposed Wetland Mitigation Concept - Eastern Alignment Alternative

Vegetation Community	Impacts (acre)	Mitigation Ratio	Total Mitigation Required (acre)	Creation or Restoration Proposed (acre)	Enhancement Proposed (acre)
Eastern Alignment (City's Preferred Alternative)					
Riparian Scrubs; Southern Willow Scrub and Disturbed Mule-fat Scrub	0.25 (road and bridge construction corridor)	3:1 including 1:1 restoration 2:1 enhancement	0.75	0.25 Restoration in Project corridor in river	0.5 Enhancement north of berm on JPA Site: East
	0.61 (bridge and road permanent footprint)	3:1 including 1:1 creation 2:1 enhancement	1.83	0.61 Creation north of berm on JPA Site: East	1.22 Enhancement north of berm on JPA Site: East
Disturbed Coastal Brackish Marsh with Clapper Rail (San Dieguito River)	0.27 (bridge construction corridor)	4:1 including 1:1 restoration 3:1 creation	1.08	0.27 Restoration in project corridor in river 0.81 Creation south of berm on JPA Site: East	--
	0.5 (bridge permanent footprint)	4:1 creation	2.0	2.0 Creation south of berm on JPA Site: East	--
Disturbed Coastal Brackish Marsh without Clapper Rail (Drainage ditches)	2.19 (road construction corridor and permanent footprint)	4:1 including 1:1 creation 3:1 enhancement	8.76	2.19 Creation south of berm on JPA Site: East	6.57 No likely enhancement sites found. Propose 6.35 acres creation south of berm on JPA Site: East, and 0.22 acre creation of riparian scrub (out of kind) north of berm on JPA Site: East
Disturbed Southern coastal Salt Marsh (Hu property)	0.75 (road construction corridor and permanent footprint)	4:1 including 1:1 creation 3:1 enhancement	3.0	0.75 Creation on JPA Site: West	2.25 No likely enhancement sites found. Propose creation on JPA Site: West

JPA Site: East = Former Boudreau property, east of SDG&E easement (approximately 10.8 acres available south of protective berm)

JPA Site: West = Former Boudreau property, west of SDG&E easement toward the west. Selection criteria were also developed with the intention of satisfying mitigation requirements to offset direct impacts to coastal brackish marsh and indirect impacts to the endangered and fully protected light-footed clapper rail. To avoid the complications associated with other jurisdictions, it was determined that the sites should be located within City of San Diego boundaries. Additionally, the site is immediately available for use as biological mitigation.

Thus, the following criteria was developed to determine a feasible potential mitigation site:

- The site must be located within the Coastal Zone in order to mitigate for impacts within the Coastal Zone
- The site is within the San Dieguito River watershed
- It would be feasible to create coastal brackish marsh habitat on this site
- The site is currently available to be considered for use as biological mitigation
- Current land use on the site would not preclude its use as biological mitigation
- The site does not require continuous maintenance that would interfere with biological mitigation efforts
- The site is located within the City of San Diego

Each site was further evaluated according to a second list of criteria developed by the Project Team. These evaluation criteria, presented below, were used to assess the advantages and disadvantages of the possible mitigation sites.

- Ownership
- Cost
- Impacts on existing infrastructure
- Impacts on existing biological resources
- Impacts on other projects
- Ability to connect to the San Dieguito River
- Ability to enhance existing biological resources for mitigation credit
- Suitable zoning

Following an extensive analysis of potential mitigation sites, it was determined that mitigation for wetland impacts would be accomplished on an approximately 75-acre parcel formerly owned by the Boudreau Trust, now owned by the San Dieguito River Park JPA (Figure 10). This parcel is located adjacent to the project area and consists of recently abandoned tomato fields.

There are four components of the mitigation plan: 1) an area of approximately 11.35 acres to be excavated to approximately the same elevation as the river to create brackish marsh habitat suitable for breeding light-footed clapper rails; 2) a 3-acre area to be lowered by approximately 4 feet to create riparian scrub habitat; 3) a 2-acre area of riparian scrub to be enhanced through the removal of exotic species; and 4) an area of approximately 3 acres to be restored as high salt marsh habitat. Each component is illustrated in Figure 10 and is described in detail below.

Brackish Marsh Mitigation Area. The brackish marsh mitigation area was designed to provide compensation for impacts to disturbed brackish marsh impacted by the project. It includes sufficient area to mitigate for both clapper rail occupied brackish marsh (creation of 2.81 acres) as well as unoccupied habitat (creation of 2.19 acres). In addition, due to the limited area of existing brackish marsh available for enhancement near the project area, it is proposed that an additional 6.35 acres of brackish marsh be created within the brackish marsh mitigation area instead of enhanced for the enhancement portion of the mitigation program. The total enhancement acreage is estimated as 6.57 acres. The deficiency of 0.22 acre is proposed to be provided by creating 0.22 acre of riparian habitat adjacent to the river corridor. Table 11 presents the proposed acreages of creation and enhancement.

The area proposed for mitigation, the former Boudreau property, is constrained by a utility corridor that crosses the property from southeast to northwest (see Figure 10). This utility corridor includes above-ground electric lines, a buried high-pressure natural gas line, and buried fuel lines. As a result, mitigation is constrained to either the east or west portions of the site in order to avoid jeopardizing the buried utilities. Because the resource agencies desired the mitigation site to be as close to the area of impact as possible, the eastern portion of the property was used to the maximum extent possible.

As discussed below, the design of the brackish marsh mitigation area was the result of extensive study of the hydraulics of the San Dieguito River. Those studies determined that earthen berms would be required parallel to the river and parallel to the utility easement to protect the created marsh from sediment deposition that would occur during high floods (approximately greater than 20-year storm) when water would flow outside of the river banks and carry sediment across the floodplain. The function of the berms is discussed in more detail under Brackish Marsh Mitigation Area Hydraulics.

The berm parallel to the river would be extended laterally near the existing bridge to create a gently sloping ramp that would provide access to clapper rails. This extended ramp would be benched into the side of the berm and created with open stabilization material to allow plants to establish and provide cover for this secretive species. A 100-foot buffer would be maintained between the created marsh and El Camino Real per City of San Diego guidelines.

The brackish marsh would be created with slight variations in bottom elevation in order to create areas of open water adjacent to areas of dense vegetation. The brackish marsh habitat associated with the San Dieguito River that currently supports clapper rails has such topographic diversity. It is apparent that the rails require dense cover for moving within the marsh and for nesting, but forage in open areas. Water flow through the created brackish marsh site would be less than 2.4 feet per second (see hydrology discussion below) and would, therefore, be optimal for plant growth. The created site will attempt to mimic the topographic diversity and flow regime of the existing brackish marsh associated with the San Dieguito River.

Brackish Marsh Mitigation Area Hydraulics. The design of the brackish marsh mitigation area was the result of extensive study of the hydraulics of the San Dieguito River. Those studies determined that an earthen berm parallel to the river would be required to protect the created marsh from sediment deposition. The berm would have a 10-foot top width, and would stand approximately 7 to 10 feet above the current ground level, constructed at a 2.5:1 slope on the channel side of the berm, and a 2:1 slope facing into the mitigation site. An armored weir would be constructed within the berm approximately 3 feet lower than the top of the berm. This weir would be approximately 250 feet long and would allow water to flow through the constructed wetland during large flood events while excluding bedload sediment (sand). The portion of the berm that would parallel the main river channel would be protected with turf reinforcement matting (TRM) along the north-facing slope (adjacent to main channel) and would be fully vegetated and planted with native upland species. The remaining portions of the berm (i.e., the inside slopes facing the mitigation area) would also be vegetated and planted with native upland species, however, they would not require the installation of TRM. Cross sections of the berm are illustrated in Figure 11. A downstream berm would be created inside the mitigation site adjacent and parallel to the utility easement. This berm would also have an armored weir and would be planted with native upland species. The slopes of the downstream berm would not require erosion protection with TRM, because velocities would be non-erosive away from the weir.

In addition to the upstream and downstream weirs, a 36-inch RCP culvert would be installed under the existing bridge that would convey water to the mitigation area during low-flow conditions (Figure 12). The culvert allows flow and water surface elevations (WSELs) to equalize between the river channel and the mitigation area during both low and high flow storm events. As mentioned earlier, the bottom of the mitigation site would have slight variations in depth, including a low-flow pilot channel to allow for meandering of flows within the basin. During dry conditions, groundwater should also provide water to the mitigation site, much like the current conditions of the main river channel during dry weather conditions.

The flow characteristics of water entering and exiting the mitigation area would vary during different stages of each storm event. The chronology of flow entering and exiting the mitigation area is more specifically described as follows (Figure 12):

1st – The beginning of a storm event: Water enters into the low-flow culvert and the mitigation site begins to fill.

2nd – When the WSEL of the river reaches the elevation of the downstream weir: Additional water begins to enter the mitigation area by overtopping the downstream weir in a reverse direction. The water enters in a reverse direction at this stage because the downstream weir crest is slightly below that of the upstream weir. In other words, as the WSEL of the main river channel begins to rise, it will overtop the downstream weir prior to overtopping the upstream weir.

3rd – When the WSEL of the river reaches the elevation of the upstream weir: Water begins to enter the mitigation area by overtopping the upstream weir. During this phase, water continues to enter through both the low-flow culvert and the upstream weir, and exits through the downstream weir.

4th – WSEL of the river drops below the elevation of the upstream weir: At first, water continues to exit through the downstream weir until the WSELs recede below the elevation of the downstream weir crest.

5th – WSEL of the river reaches the elevation of the downstream weir and continues to recede: As WSELs continue to recede within the main channel of the river (below the elevation of the downstream weir), flow will slowly begin to exit the mitigation area through the culvert. The WSEL within the mitigation site will continue to slowly recede at approximately the same rate of the main channel.

The low-flow culvert would be flat (0% slope) which would help maintain non-erosive velocities in and out of the mitigation site. The invert elevations of the culvert should be set slightly above the main river channel bed, which would help prevent bed sediment from entering the wetland. Small riprap pads would be provided at both ends in order to stabilize the surrounding areas at each end as well.

Even during the larger storm events, flow velocities through the wetland area would be low and should have limited effects on scour. This is described on page 26 of the November 2005 study by Dr. Howard Chang. Specifically, they would be lower than 2.4 feet per second. As stated in the report, "it may therefore be concluded that the flow through the wetland will not cause scour damages."

Riparian Scrub Mitigation Area. Based on the impacts associated with the construction of the Eastern Alignment, 0.61 acre of created riparian scrub is required to offset permanent impacts to this habitat (Table 11). An additional 0.22 acre of riparian creation is proposed as out-of-kind mitigation for brackish marsh enhancement that could not be accomplished near the project area. The City is offering approximately 3 acres of riparian scrub creation in order to create a more complete restoration of the eastern portion of the JPA parcel, which is more than 3.5 times the acreage actually needed for mitigation.

The riparian scrub mitigation area would be created by removing approximately 4 feet of existing soil. This removal would bring the area closer to the water table and expose soils that have not been subjected to amendment and fertilization associated with agricultural practice on the property. With the existing ground surface varying between approximately 11 and 12 feet, removal of 4 feet of soil would result in elevations of approximately 7 to 8 feet. The water table in this area is at approximately 3 to 6 feet below the current ground level. Thus, by lowering the ground level by 4 feet, the riparian scrub mitigation area would be sufficiently wet to support the proposed created habitat.

Riparian Scrub Enhancement Area. The approximately 2-acre site identified for riparian enhancement is currently composed of mule-fat (*Baccharis salicifolia*) and willows (*Salix* spp) with a high density of salt cedar (*Tamarix* sp.), an exotic invasive species. The salt cedar and other invasive species would be removed to enhance the riparian corridor in this part of the river.

High Salt Marsh Mitigation Area. Impacts to isolated, non-tidal salt marsh habitat located near the intersection of El Camino Real and Via de la Valle will be mitigated by creating higher quality high salt marsh on the west side of the utility corridor. Although only 0.75 acres of creation are required under the proposed mitigation ratios, the lack of available high salt marsh for enhancement is balanced by providing creation at a 4:1 ratio.

Feasibility of the Proposed Mitigation Site to Support Target Habitats. The proposed restoration of the former Boudreau parcel has been designed in much the same manner as the San Dieguito Lagoon Wetlands Restoration Project located immediately to the west. Both areas were converted to agriculture in the past, both require berms to ensure that they are not filled with sediment during floods, and both have been designed to complement existing hydrological conditions.

Historical photographs demonstrate that both the area proposed for restoration as salt marsh by Southern California Edison (SCE) for the San Dieguito Lagoon restoration and the area proposed for brackish marsh by the City of San Diego for the El Camino Real project were converted to agriculture in the recent past. The area north of the San Dieguito River and east of I-5 that is the main intertidal salt marsh restoration area for the San Dieguito Lagoon restoration is shown to be in agricultural use in 1953 and 1964 aerial photographs. This suggests that this area was farmed for a minimum of 11 years. The former Boudreau parcel is shown in agricultural use in 1928, 1964 and 1997 aerial photographs, indicating that this parcel has been farmed, at least periodically, for nearly 80 years.

Agricultural practices were abandoned for the area north of the San Dieguito River and east of I-5 that is the main restoration area of the San Dieguito Lagoon restoration well before planning of the San Dieguito Lagoon restoration began in the early 1990s. Much of this area has been colonized by common pickleweed (*Salicornia virginica*) and glasswort (*Salicornia subterminalis*), both considered high salt marsh species. In addition, due to modifications from agriculture and frequent closure of the lagoon's tidal inlet, this area is not subject to tidal action. Therefore, it must be assumed that pickleweed and glasswort became established on the former agricultural parcel once farming and associated irrigation ceased. This type of conversion has been observed on formerly farmed parcels near the coast in the Tijuana River Valley (Zedler and Nordby 1986). The colonization of these areas with these salt tolerant species suggests that the soils retain salts from ancient tidal influence long after agricultural practices of soil augmentation and irrigation have ceased. The silty/sandy soils of the proposed mitigation site are suitable for the establishment of brackish marsh plant species and the marsh is expected to accumulate silts and other fine sediments as it evolves. While the pH of the soils on-site has not been tested, this is not expected to be a contributing factor for plant establishment and growth.

The area proposed for brackish marsh creation for the El Camino Real project occurs upstream of San Dieguito Lagoon where there is no longer any tidal action (Howard Chang, pers, comm.). However, within the river channel, the wetland habitat is co-dominated by both freshwater and salt marsh vascular plant species, suggesting, again, the presence of saline soils. It is because of this brackish marsh within the San Dieguito River channel at El Camino Real that the proposed mitigation is located immediately adjacent to the bridge where similar soils are expected.

The former Boudreau parcel was purchased in 2004 by the JPA with funds from the California Coastal Conservancy. A conceptual habitat restoration plan was developed for the parcel (Tierra 2004) that was based on the non-tidal restoration plans developed by Tierra and Dudek & Associates presented in the Park Master Plan (January 2000). Both the conceptual restoration plan for the Boudreau parcel and the non-tidal restoration plans developed for the Park Master Plan are relevant to the current brackish marsh restoration plan developed for the El Camino Real project.

The conceptual restoration plan originally developed for the Boudreau parcel included the creation/restoration of four habitat types, including native grassland, seasonal salt marsh, transition and Diegan coastal sage scrub, and enhancement of southern willow scrub habitat. Seasonal salt marsh restoration was modeled after the same type of habitat to be created as part of the San Dieguito Lagoon Wetlands Restoration Project. Seasonal wetlands are defined as those that have either saturated or inundated soils during the rainy season (SCE 2000). Most of the seasonal wetlands in San Diegiuto Lagoon are dominated by pickleweed. These occur east of I-5 and south of the shopping center at the I-5/Via de la Valle intersection and east of I-5 and south of the river adjacent to the bluffs that define the upland portion of the river valley.

The conceptual restoration plan for the Boudreau parcel proposed to create seasonal wetlands that would take advantage of seasonal runoff conveyed by culverts beneath El Camino Real. In particular, a large box culvert conveys runoff from Gonzalez Canyon approximately 900 feet west of the SDG&E utility easement. It is at this site that the seasonal wetlands for the conceptual restoration, and now the El Camino Real Road/Bridge Project mitigation, are planned. While the water conveyed during rain events would be fresh, it is anticipated that the natural salts occurring in the soils would be retained as the freshwater evaporates, thus maintaining a saline environment. Saline soils can be observed on the SDG&E easement where the soils have not been farmed. The soils here are compact with a surface layer of salt. Halophytes, including pickleweed and saltgrass (*Distichlis spicata*), are sparsely distributed within the easement.

The seasonal salt marsh habitat proposed to be created on the west side of the SDG&E easement as mitigation for the El Camino Real project would be graded to match the elevations found at the seasonal wetlands that occur in San Dieguito Lagoon east of I-5 and south of Via de la Valle and east of I-5 south of the San Dieguito River. The elevations at these sites range from about 7 to 10 feet above NGVD. The elevation of the area proposed for seasonal salt marsh at the former Boudreau parcel is approximately 12-13 feet above NGVD. Thus, it is proposed that approximately 3 feet of soil be excavated to create a depression that captures runoff conveyed beneath El Camino Real, which, upon evaporation or percolation, will concentrate naturally occurring salts that support halophytic plant species. By grading to lower the elevation, soils that have been augmented for farming would be removed and more saline soils would be exposed. It is consistent with previous plans that this area be lowered to facilitate mitigation success.

The SDG&E easement would not be disturbed as part of the proposed mitigation plan. As stated above, this area exhibits salt-encrusted soils that support halophytic plant species. Thus, the existing conditions of the easement are compatible with the proposed conditions on the west side of the easement, i.e., seasonal salt marsh.

The riparian creation proposed as mitigation for the El Camino Real project is also designed to mimic the natural southern willow scrub habitat that exists on the banks of the San Dieguito River west of the El Camino Real bridge. Lowering the elevation of this area by approximately 4 feet will allow the planted trees access to groundwater from the river. This habitat type has invaded the former tomato fields during winter on previous occasions when the tomatoes had been harvested and the fields were fallow (C. Nordby, personal observation) During the 2004-2005 winter, willow and mule-fat saplings invaded the furrows created to grow tomatoes. Thus, it is apparent that this habitat type can become established naturally at the current elevation.

The berms that protect the created wetlands from sedimentation would be vegetated with coastal sage scrub species. The north-facing slope of the berm that is adjacent to the main channel would be armored with turf reinforcement matting (TRM). This can be cut to allow plants to be planted in the soil beneath the TRM. The inside slopes of the berm (within the mitigation area), as well as the west-facing (outside) slope of the berm that parallels the utility corridor would all be planted as well, but would not require TRM, because velocities would be non-erosive in these areas. The coastal sage scrub planting palette is consistent with the Park Master Plan and the conceptual restoration plan prepared for the former Boudreau parcel (Table 12).

The coastal sage scrub plant palette is not expected to affect the brackish marsh as these upland species are not adapted to wet conditions. It is anticipated that the boundary between upland and wetland will come to a natural equilibrium over the first two to three growing seasons.

A temporary overhead irrigation system would be installed prior to planting the coastal sage scrub elements. The irrigation system would be used to provide supplemental water until plantings have become established. The use of the irrigation system would be phased out gradually depending on the local weather conditions during the establishment period. It is anticipated that groundwater can be pumped for irrigation as was recently done to irrigate the tomato fields. It is not expected that the minor runoff that would occur during operation of the irrigation system would affect the brackish marsh as the duration of these events would be short lived and would contribute very little in terms of the overall water supply to the site. Thus brackish conditions, which are mostly due to salty soils, would not be affected.

Table 12. Plant Palette Species Composition for Diegan Coastal Sage Scrub Restoration

Scientific / Common Name	Container Size	% Composition	Spacing on Center (initial planting)
Artemisia californica/California sagebrush	1 gal	25%	3 ft.
Baccharis pilularis/Coyote bush	1 gal.	5%	3 ft.
Isomeris arborea/Bladderpod	1 gal.	5%	3 ft.
Encelia californica/California encelia	1 gal.	10%	3ft.
Eriogonum fasciculatum/California buckwheat	1 gal.	20%	3 ft.
Isocoma menziesii/Spreading goldenbush	1 gal.	20%	6 ft.
Lessingia filaginifolia/California aster	1 gal.	5%	3 ft.
Hydroseed Mix	**%P/%G**		**Lbs./ac.**
Ambrosia psilostachya/Western ragweed	2/30		2
Artemisia californica/Coastal sagebrush	15/50		6
Castilleja exserta/Owl's clover	50/50		2
Encelia californica/California encelia	40/60		4
Eriogonum fasciculatum/California buckwheat	10/65		8
Eschscholzia californica/California poppy	98/75		4
Isocoma menziesii/Spreading goldenbush	20/40		4
Lotus scoparius/Deerweed	98/75		8
Lupinus succulentus/Arroyo lupine	95/80		2
Mimulus aurantiacus/Coast monkey flower	2/55		4
Nassella pulchra/Purple needlegrass	70/60		3
Salvia mellifera/Black sage	70/50		3
Phacelia parryi/Parry's phacelia	95/70		2
Plantago ovata/Woolly plantain	98/75		2
Total Lbs. Per Acre:			**54 Lbs.**

IX. B. Protection Element

This mitigation monitoring and reporting program is presented to provide assurance that mitigation measures were properly undertaken and successful in restoring project impacts. The plan includes conditions for construction monitoring, revegetation, and revegetation monitoring.

IX. B. 1. Construction monitoring. Construction monitoring will be conducted during all phases of the project to minimize impacts to native vegetation, sensitive species, and damage to soils. Construction monitoring will be conducted by a qualified biologist. This individual or individuals will have a minimum of a Bachelor's degree in biology, botany or related science and will have at least 2 years experience in monitoring of native habitat restoration projects in southern California. Construction fencing will be provided on the limits of construction areas prior to grading activity. The construction monitor will provide a letter to the Environmental Review Manager before the commencement of construction activities. This letter will propose mitigation for impacts, not assessed in this report, that occur during construction.

IX. B. 2. Revegetation. The restoration of degraded habitat on-site, in addition to the restoration of habitats impacted by project activities, will be considered as mitigation. The following sections outline specific species for planting/hydroseeding, irrigation, maintenance, monitoring and reporting program, and criteria for success, in addition to contingency measures in the event that the revegetation efforts fail.

a. Site Preparation

Grading

Grading to create wetland habitat will be required in order to lower the existing elevation of the proposed mitigation site. In addition to lowering the elevation in these areas, grading will allow the

removal of soils augmented for farming on the former Boudreau property. Grading at the proposed mitigation area will result in a net export of soil from the site.

Brackish Marsh Mitigation Area. Approximately 11.35 acres of this habitat will be created as shown in Figure 10. Brackish marsh habitat will be created at approximately the same elevation as the existing brackish marsh habitat that occurs in the river bed near the bridge (roughly 5-6 feet National Geodetic Vertical Datum). The existing elevation of the proposed brackish marsh mitigation area on the former Boudreau property ranges from approximately 11-17 National Geodetic Vertical Datum (NGVD). Thus, anywhere from 5 to 12 feet of soil must be graded and transported off-site.

Riparian Scrub Mitigation Area. Approximately 3 acres of this habitat will be created on-site as shown in Figure 10. Mule-fat/southern willow scrub habitat will be created at the same elevation as existing mule-fat/willow scrub habitat, roughly 7-8 feet NGVD. This will require the removal of approximately 4 feet of existing soil and transportation off-site.

Riparian Scrub Enhancement Area. Approximately 2 acres of degraded riparian habitat will be accomplished in the area depicted in Figure 10. This riparian habitat is heavily infested with salt cedar (*Tamarix* sp) the removal of which will greatly enhance the riparian corridor of the San Dieguito River.

High Salt Marsh Mitigation Area. Approximately 3 acres of former tomato field will be planted with high salt marsh plant species. Approximately 3 feet of soil would be graded and transported off site.

b. Planting Specification

Seed and Plant Sources and Procurement

All seeds and container stock included in hydroseed mixes used for habitat revegetation should be collected on-site if possible, to retain the genetic integrity of the area. If certain species are not available, seeds and container stock may be attained from a commercial source, upon approval from the City and the resource agencies.

Planting Plan

Brackish Marsh. Brackish marsh creation includes perennial herbaceous species established from container stock (Table 13). The planting pallette for this habitat has been designed to mimic existing brackish marsh habitat in the area of the bridge and includes planting densities and container sizes proposed in the Park Master Plan for the Coastal Area of the San Dieguito River Valley Regional Open Space Park (JPA 2000). The dominant species include a mixture of traditional fresh and salt marsh species including pickleweed (*Salicornia virginica*), alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), spiny rush (*Juncus acutus*), southern cattail (*Typha domingensis*), bulrush (*Scirpus maritimus*) and California bulrush (*Scirpus californicus*). All species except southern cattail will be planted from container stock grown from seed or cuttings collected within the project site. Southern cattail is expected to colonize the site naturally from existing stock. Spacing and densities are presented in Table 13. The planting plan applies to revegetation of brackish marsh areas disturbed in the ditches parallel to Via de la Valle and El Camino Real, and in the San Diego River as well as the brackish marsh creation on the mitigation site.

Riparian Scrub. Riparian scrub, composed of mule-fat/southern willow scrub habitat will be planted with mule-fat (*Baccharis salicifolia*), willow species (*Salix* spp.) and selected understory elements (Table 14). Mule-fat and willows will be planted as 1-gallon containers installed on approximately 10-foot centers at total densities of about 440/acre. Containers will be planted in augered holes to facilitate tap root development. Container stock will be planted in groups to allow open areas for seeded understory plants.

Additional shrub and grass species are proposed for the riparian scrub areas to provide diversity and food sources for wildlife. These include San Diego marsh elder (*Iva hayesiana*), giant wild rye (*Elymus condensatus*) and California rose (*Rosa californica*).

Table 13. Plant Pallette Species Composition for Brackish/Marsh Creation

Botanical/Common Name	*Container Size*	*Percent Composition*	*Spacing on Center (initial planting)*
Shrubs			
Distichlis spicata/saltgrass	6-inch pot	20	1 ft.
Frankenia salina/alkali heath	1-gallon	10	3 ft.
Juncus acutus/spiny rush	1-gallon	10	6 ft.
Salicornia virginica/pickleweed	1-gallon	20	3 ft.
Scirpus californicus/California bulrush	1-gallon	20	3 ft.
Scirpus maritimus/bulrush	1-gallon	20	3 ft.

Several species will be planted in the revegetation site from seed. These include western ragweed (*Ambrosia psylostachya*), Douglas mugwort (*Artemisia douglasiana*), Palmer's sage wort (*Artemisia palmeri*), creeping wild rye (*Leymus triticoides*) and great marsh evening-primrose (*Oenothera hookeri*; Table 14). Seeds for establishing understory species will be purchased from a commercial seed company. All seeds will be tested for purity, percent germination and number of live seeds per pound prior to broadcasting at the mitigation site. Testing costs will be included in the seed costs. Results of the seed tests will be made available to the restoration consultant prior to seed delivery.

Riparian Scrub Enhancement. The riparian scrub enhancement plan entails the removal of target weed species from the site. These species include salt cedar, pepper tree, giant reed and eucalyptus. Salt cedar and giant reed should be removed by cutting and removing above ground biomass and treating the cut stump with glyphosate (e.g., Garlon 4 or AquaMaster™). Herbicide should be painted directly onto the cut stump. Herbicide should be applied only by a licensed applicator. All above-ground biomass should be removed from the site. Removal of eucalyptus and pepper trees involves cutting and removing above ground biomass and injecting each cut stump with the herbicide.

High Salt Marsh The plant palette for the creation of high salt marsh is similar to that presented above for brackish marsh (Table 15), with the exception of *Scirpus* and *Juncus* species. The intent of this mitigation component is to create non-tidal high salt marsh that is self-sufficient and of higher quality than that impacted by the project. The plan is consistent with the Park Master Plan for the Coastal Area of the San Dieguito River Valley Regional Open Space Park (JPA 2000).

Table 14. Plant Palette for Riparian Scrub Revegetation

Botanical/Common Name	*Container Size*	*Plants per acre*	*Spacing on Center (initial planting)*
Trees			
Salix exigua/narrow-leaved willow	1 gal.	100	10 ft.
Salix lasiolepis/arroyo willow	1 gal.	50	10 ft.
Salix gooddingii/Goodding's black willow	1 gal.	50	10 ft.
Sambucus mexicana/blue elderberry	1 gal.	20	10 ft.
Shrubs			
Baccharis salicifolia/mule-fat	1 gal.	220	10 ft.
Iva hayesiana/San Diego marsh elder	1 gal	100	6 ft.
Leymus condensatus	1 gal.	200	3 ft.
Rosa californica	1 gal.	100	6 ft.
Hydroseed mix	*% pur/%germ*	*Lbs/Acre*	
Ambrosia psilostachya var. *californica*/ western ragweed	4/30	2	
Artemisia douglasiana/mugwort	10/50	5	
Artemisia palmeri/Palmer's sagewort	15/50	2	
Oenothera elata ssp. hookeri/Hooker's evening primrose	98/75	1	
Leymus triticoides/ Creeping wild rye	95/80	5	
Iva hayesiana/San Diego marsh elder	30/20	4	

Timing of Installation

Planting should be timed to coincide with the winter rainy season, if possible, to take advantage of natural precipitation. Regardless of the final timing of installation, installation of the irrigation system must be completed prior to planting. Treatment of salt cedar and other exotics should occur during fall when sap is being translocated to the roots. No treatment or removal of exotics will occur during the general avian breeding season (February 15 through September 15).

Table 15. Plant Palette Species Composition for High Salt Marsh Creation

Scientific/Common Name	Container Size	% Composition	Spacing on Center
Frankenia salina/alkali heath	1-gallon	10%	3 ft
Distichlis spicata /saltgrass	6" pot	10%	1 ft.
Salicornia virginica/pickleweed	1-gallon	40%	3 ft
Limonium californicum/sea lavender	1 gallon	10%	3 ft
Monanthochloe littoralis/shoregrass	6" pot	10%	1 ft.
Salicornia subterminalis/glasswort	1 gallon	20%	3 ft

Irrigation

A temporary overhead irrigation system will be installed at the riparian scrub and high salt marsh mitigation areas prior to any planting. The irrigation system will be used to provide supplemental water to these restoration sites until plantings have become established. The use of the irrigation system will be phased out gradually depending on the local weather conditions during the establishment period (e.g., after the first growing season). It is anticipated that ground water can be pumped to be used in the irrigation system as is currently being done to irrigate the tomato fields.

Riparian scrub and high salt marsh plants and seed mixes should be irrigated immediately after planting. The amount of water and duration of irrigation should be determined by the revegetation contractor and approved by the project biologist. Each watering episode should allow for deep penetration of the water into the soil. Deep soaking of the soil will promote good root development and will enhance survivorship of seedlings and container stock.

Irrigation will be provided on an as-needed basis for a minimum of the first year after planting. The need for irrigation to continue beyond the first year will be evaluated by the project biologist, based on the overall survival and vigor of the planted material. Local drought conditions should be considered when evaluating the need and time period for supplemental irrigation. The irrigation program will be designed to provide water necessary for the initial establishment of the plantings, but the goal of the restoration effort is to create a habitat supported by natural weather conditions. However, irrigation of the site will be necessary until the plants are determined to be self-sufficient.

As-Built Conditions

Within 60 days of completion of site preparation and planting, a report will be submitted describing the as-built status of the mitigation project. Separate reports will be submitted for grading, plant installation, and erosion control measures. In addition, topographic maps showing as-built contours of the restoration site, as well as locations of plantings, will be provided. Changes from original plans will be indicated in indelible red ink. Significant changes from the original planting plan will be coordinated with and approved by the appropriate agencies prior to implementation.

IX. B. 3. Revegetation Maintenance and Monitoring

This section describes maintenance, biological monitoring and reporting of the revegetation site. Criteria for revegetation success is outlined as well as contingency measures in the event that the revegetation efforts fail.

Maintenance and Monitoring Plan

Monitoring Period. To determine if the mitigation site is functioning as expected, biological monitoring will be conducted. Monitoring surveys will concentrate initially on qualitative observations to identify potential problems and recommend remedial maintenance actions, where necessary. Remedial actions, described in greater detail below, may be necessary to address factors that could jeopardize attainment of the criteria for success. Ultimately, the success of the mitigation plan will be evaluated by comparing the final year of monitoring data with project success criteria.

Monitoring is proposed for a five year period. At that time, if established target values for plant coverage and for areal cover have been achieved, further monitoring of the site will not be necessary and the restoration will be deemed a success.

It is recommended that monitoring be conducted monthly for the first three months after planting, quarterly for the remainder of Year 1 and all of Year 2, and semi-annually for Years 3-5. The monthly monitoring surveys conducted during the first three months will concentrate on qualitative observations to identify potential problems and recommend maintenance activities, where necessary.

Maintenance Period. Maintenance activities are proposed for a period of five years, beginning at the end of the plant establishment period. Often, success criteria are achievable by the end of Year 3. Therefore, the need for additional maintenance beyond Year 3 will be determined at the end of that year. The maintenance contractor will be responsible for maintaining the plants and planting sites in good condition and maintaining the irrigation system. Maintenance inspections will be conducted concurrently with biological monitoring of the site. Thus, maintenance inspections will be conducted monthly for the first three months after planting, and quarterly for the first two years following the plant establishment period. Subsequent inspections will be conducted on a semi-annual basis.

Specific maintenance activities will be determined by observations made during the scheduled site visits described above. Plant replacement, repairs to the irrigation system, erosion control and other remedial actions to correct problems or damage resulting from natural causes, vandalism or other factors that may jeopardize the successful completion of the project will be performed promptly, generally within two weeks of identification of the problem.

Replacement Planting. Planted material that fails to become established during the maintenance period as a result of disease, vandalism, or other natural causes, will be replaced with similar plant species. Supplemental planting will occur as required, based on the results of site monitoring. Replacement vegetation should be installed between October 1 and March 31.

Weed Abatement. Observations made during maintenance and monitoring visits will identify any need for non-native plant control. Measures to control weedy species will be implemented promptly. Some exotic species may invade the restoration site and become a problem before the native species can become established. Species that cause problems in southern California riparian systems include salt cedar (*Tamarix* sp.), pampas grass (*Cortaderia selloana*), giant reed (*Arundo donax*), castor bean (*Ricinus communis*), tree tobacco (*Nicotiana glauca*), and bristly ox tongue (*Picris echioides*). Because the site is currently used as a tomato field, it can be expected that this species will also pose a weed problem. All weedy species should be removed from the restoration site frequently so they do not compete with the establishment of the native plantings. Removal of exotic species will take place at least monthly during Year 1 and as needed thereafter as determined by the project biologist. The exotic species should be removed by hand wherever possible. In the case of large, monotypic areas of weeds, limited use of herbicide may be allowed.

Vandalism. The mitigation area should be protected and maintained from vandalism, breakage of irrigation system, uprooting of plantings, off-road vehicle activity, and illegal trash dumping by the installation of an appropriate access barrier. Posted signs designating the area as a restoration site may deter casual vandalism.

Maintenance and monitoring of the mitigation site will continue until the objectives of the plan are met. Success of the plantings also will be assessed at 2, 3, 4, and 5 years after installation. Plantings within the restoration area must achieve the specified goals of plant survival and coverage, as described below.

Monitoring Methods

Monitoring will be conducted by the designated Project Biologist. The Project Biologist shall possess a minimum of a bachelor's degree in biology, botany, ecology or a closely related field. In addition, the Project Biologist shall demonstrate expertise in southern California wetland habitats including recognition of the dominant annual and perennial plant species of wetland habitats and the ecological requirements of those species. The Project Biologist shall have a minimum of four years experience in the implementation of southern California wetland restoration projects.

Initial monitoring will begin following a 120-day plant establishment period. The as-built plantings will be compared to the original planting plan with any deviation from the plan mapped and noted. Any significant deviations will be inspected by a restoration specialist and, if necessary, additional plantings made to conform to the plan. The map of the site will identify planting methods, species, densities, and spacing of plants. Final inspection will be conducted by the Project Biologist. The monitoring period will start when the project is accepted by the Project Biologist.

Both qualitative and quantitative data will be collected during monitoring surveys. Qualitative information will be similar to that collected during initial monitoring surveys, and will include observations of wildlife use on-site, general site conditions and plant health, identification of potential problems and remediation alternatives. Quantitative information will include survivorship and growth, canopy development, and estimated cover of seeded areas.

In order to minimize impacts to created brackish marsh, it is proposed that quantitative analyses be conducted remotely, using low altitude aerial photography supplemented by ground-truthing. For riparian scrub and high salt marsh, quantitative data will be collected along line and belt transects positioned randomly throughout the site. Two transects per acre are recommended. Survival will be measured by direct counts within established belt transects. Vegetation growth and establishment will be quantitatively assessed using appropriate California Native Plant Society (CNPS) methodology. On each transect, height and cover will be determined for each species rooted in the transect. These data are recorded on standard field data forms and, along with notes of observations, kept on file by the City or their agent for documentation purposes.

Permanent photo-documentation stations will also be established within each habitat type to visually document the vegetational changes and community development. Representative photographs shall be taken during each assessment.

Monitoring of the riparian enhancement area should be conducted at six month intervals for Year 1 to ensure that treated species are dead. Additional herbicide application may be necessary for the successful treatment of salt cedar. If treated species are still alive after Year 1, monitoring will be extended as needed until the herbicide treatment is effective.

Monitoring Reports

The data described above will be presented in interim reports that will be submitted to the City and appropriate agencies following each quarterly and semi-annual monitoring survey. At the end of each monitoring year, an annual report also will be submitted to these agencies. Interim and annual reports will discuss the progress of the restoration site and will prescribe corrective measures that may facilitate the attainment of restoration success as defined by the established performance goals, presented below. A review of the project by the resource agencies will occur within 45 days of receiving the report and remedial measures will be recommended, if necessary.

Success Criteria

In order to determine if the goals of the revegetation program have been achieved, certain success criteria must be met. These criteria typically include quantified measures such as percent survival and percent cover by species. As discussed, these data will be collected during periodic monitoring events. Each monitoring report will evaluate if these criteria have been met and prescribe corrective measure necessary. Success criteria for each monitoring year are presented below for each of the habitats to be created.

Brackish Marsh Mitigation Area

<u>First Year Performance Standards</u>. It is anticipated that the brackish marsh vegetation will establish quickly once the proper hydrologic conditions are established. Year 1 performance standards will include an overall survival rate of planted monocots of 80%. Any mortality exceeding 20% will require replanting.

Second Year Performance Standards. By the end of Year 2, planted species should comprise 30% total cover, except in areas of open water caused by slight variations in elevation. During Year 2, 100% of the container stock that survived during Year 1 must be alive or replaced.

Third Year Performance Standards. By the end of Year 3, planted species should comprise 50% total cover except in areas of open water caused by slight variations in elevation. 100% of the container stock that survived during Year 1 must be alive or replaced.

Fourth Year Performance Standards. By the end of Year 4, planted species should comprise 65% total cover except in areas of open water caused by slight variations in elevation.

Fifth Year Performance Standards. By the end of Year 5, planted species should account for 85% total cover except in areas of open water caused by slight variations in elevation.

Riparian Scrub Mitigation Area

First Year Performance Standards. It is difficult to characterize survival of seeded areas during the first months following application. An overall criteria of 50% germination and survival of the hydroseed mix is required for Year 1. Should the hydroseed fail to achieve 50% germination and survival in Year 1, additional seeding will be required. During Year 1, 80% of all container stock must survive or be replaced.

Second Year Performance Standards. By the end of Year 2, hydroseeded species should account for 35% total cover in areas without container stock. During Year 2, 100% of the container stock that survived during Year 1 must be alive or replaced.

Third Year Performance Standards. By the end of Year 3, hydroseeded species should account for 50% total cover in areas without container stock. During Year 3, 100% of the container stock that survived during Year 1 must be alive or replaced. Target height for tree species is minimum of 8 feet by Year 3, with the exception of narrow-leaved willow (6 feet).

Fourth Year Performance Standards. By the end of Year 4, hydroseed species should account for 65% total cover in areas without container stock. Target height for tree species is minimum of 10 feet by Year 4, with the exception of narrow-leaved willow (8 feet).

Fifth Year Performance Standards. By the end of Year 5, hydroseed species should account for 85% total cover in areas without container stock. Target height for tree species is minimum of 12 feet by Year 5, with the exception of narrow-leaved willow (8 feet).

High Salt Marsh Mitigation Area

First Year Performance Standards. Year 1 performance standards will include an overall survival rate of planted species of 80%. Any mortality exceeding 20% will require replanting.

Second Year Performance Standards. By the end of Year 2, planted species should comprise 30% total cover. During Year 2, 100% of the container stock that survived during Year 1 must be alive or replaced.

Third Year Performance Standards. By the end of Year 3, planted species should comprise 45% total cover.

Fourth Year Performance Standards. By the end of Year 4, planted species should comprise 60% total cover.

Fifth Year Performance Standards. By the end of Year 5, planted species should account for 75% total cover.

Notification of Completion

Once the project monitor determines that the success criteria have been met, a report summarizing the revegetation project will be prepared and submitted to the City of San Diego, the U.S. Army Corps of Engineers, and California Department of Fish and Game. Upon acceptance of the revegetation site by the agencies, long term management will become the responsibility of either the property owner (JPA), or a designated agent of the City or the JPA.

Secondary Impacts from Implementation of the Mitigation Plan

The proposed mitigation plan components and their impact on existing resources are illustrated in Figure 13. The majority of the mitigation areas are located on former tomato fields and, thus, have no impact on sensitive biological resources. For the Eastern Alignment Alternative only, an additional 0.02 acre of DCSS would be impacted by the protective berm. This impact will be mitigated through a contribution to the City's Habitat Acquisition Fund. The extreme easternmost mitigation features, including the clapper rail access and low flow culvert, will be constructed within the area impacted by the existing bridge and new bridge. Impacts associated with the construction of these features have been accounted for as part of the bridge impacts. Removal of salt cedar and other exotic species will be conducted on foot by field crews outside of bird breeding season (February 15 through September 15). Implementation of the mitigation plan will not result in any additional impacts to wetland resources.

IX. C. Additional Mitigation Measures

In addition to mitigation measure to the implementation of the revegetation plan previously presented, the following mitigation measures will be implemented to minimize project impacts to biological resources.

Prior to bid opening/bid award, the Transportation and Drainage Design Division shall verify that the following measures are incorporated into the plans and specifications and City monitoring requirements.

Prior to Permit Issuance

A. Land Development Review (LDR) Plan Check

1. Prior to permit issuance or Bid Opening/Bid Award, whichever is applicable, the Assistant Deputy Director (ADD) environmental designee shall verify that the requirements for the revegetation/restoration plans and specifications, including mitigation of direct impacts to the vegetation communities and acreages shown for the build alternatives in Tables 3.12-7a through 3.12-7d, including disturbed southern willow scrub, disturbed mule-fat scrub, disturbed coastal brackish marsh, disturbed southern coastal salt marsh, and disturbed Diegan coastal sage scrub have been shown and noted on the appropriate landscape construction documents. The landscape construction documents and specifications must be found to be in conformance with the final revegetation/restoration plan ("Exhibit A") prepared by the designers, the requirements of which are summarized below:

B. Revegetation/Restoration Plan(s) and Specifications

1. Landscape Construction Documents (LCD) shall be prepared on D-sheets and submitted to the City of San Diego Development Services Department, Landscape Architecture Section (LAS) for review and approval. LAS shall consult with the Environmental Analysis Section (EAS) or Mitigation Monitoring Coordination (MMC) and obtain concurrence prior to approval of LCD. The LCD shall consist of revegetation/restoration, planting, irrigation and erosion control plans; including all required graphics, notes, details, specifications, letters, and reports as outlined below.
2. Landscape Revegetation/Restoration Planting and Irrigation Plans shall be prepared in accordance with the San Diego Land Development Code (LDC) Chapter 14, Article 2, Division 4, the LDC Landscape Standards submittal requirements, and Attachment "B" (General Outline for Revegetation/Restoration Plans) of the City of San Diego's LDC Biology Guidelines (July 2002). The Principal Qualified Biologist (PQB) shall identify and adequately document all pertinent information concerning the revegetation/restoration goals and requirements, such as but not limited to, plant/seed palettes, timing of installation, plant installation specifications, method of watering, protection of adjacent habitat, erosion and sediment control, performance/success criteria, inspection schedule by City staff, document submittals, reporting schedule, ect. The LCD shall also include comprehensive graphics and notes addressing the ongoing maintenance requirements (after final acceptance by the City).

3. If a Brush Management Program is required the revegetation/restoration plan shall show the dimensions of each brush management zone and notes shall be provided describing the restrictions on planting and maintenance and identify that the area is impact neutral and shall not be used for habitat mitigation/credit purposes.

Prior to Start of Construction

A. Letters of Qualification Have Been Submitted.

1. The applicant shall submit, for approval, a letter verifying the qualifications of the biological professional to MMC. This letter shall identify the PQB, Principal Restoration Specialist (PRS), and QBM, where applicable, and the names of all other persons involved in the implementation of the revegetation/restoration plan and biological monitoring program, as they are defined in the City of San Diego Biological Review References. Resumes and the biology worksheet should be updated annually.
2. MMC will provide a letter to the applicant confirming the qualifications of the PQB/PRS/QBM and all City Approved persons involved in the revegetation/restoration plan and biological monitoring of the project.
3. Prior to the start of work, the applicant must obtain approval from MMC for any personnel changes associated with the revegetation/restoration plan and biological monitoring of the project.
4. PBQ must also submit evidence to MMC that the PQB/QBM has completed Storm Water Pollution Prevention Prevention Program (SWPPP) training.

B. PQB/PRS Shall Attend Preconstruction (Precon) Meetings

1. Prior to beginning any work that requires monitoring:
    a. The owner/permittee or their authorized representative shall arrange and perform a Precon Meeting that shall include the PQB or PRS, Construction Manager (CM) and/or Grading Contractor (GC), Landscape Architect (LA), Revegetation Installation Contractor (RIC), Revegetation Maintenance Contractor (RMC), Resident Engineer (RE), Building Inspector (BI), if appropriate, and MMC.
    b. The PQB shall also attend any other grading/excavation related Precon Meetings to make comments and/or suggestions concerning the revegetation/restoration plan(s) and specifications with the RIC, CM and/or GC.
    c. If the PQB is unable to attend the Precon Meeting, the owner shall schedule a focused Precon Meeting with MMC, PQB/PRS, CM, BI, LA, RIC, RMC, RE and/or BI, if appropriate, prior to the start of any work associated with the revegetation/ restoration phase of the project, including site grading preparation.
2. Where Revegetation/Restoration Work Will Occur
    a. Prior to the start of any work, the PQB/PRS shall also submit a revegetation/restoration monitoring exhibit (RRME) based on the appropriate reduced LCD (reduced to 11"x 17" format) to MMC, and the RE, identifying the areas to be revegetated/restored including the delineation of the limits of any disturbance/grading and any excavation.
    b. PQB shall coordinate with the construction superintendent to identify appropriate Best Management Practices (BMP's) on the RRME.

3. When Biological Monitoring Will Occur
    a. Prior to the start of any work, the PQB/PRS shall also submit a monitoring procedures schedule to MMC and the RE indicating when and where biological monitoring and related activities will occur.
4. PQB Shall Contact MMC to Request Modification
    a. The PQB may submit a detailed letter to MMC prior to the start of work or during construction requesting a modification to the revegetation/restoration plans and specifications. This request shall be based on relevant information (such as other sensitive species not listed by federal and/or state agencies and/or not covered by the MSCP and to which any impacts may be considered significant under CEQA) which may reduce or increase the potential for biological resources to be present.

During Construction

A. PQB or QBM Present During Construction/Grading/Planting
    1. The PQB or QBM shall be present full-time during construction activities including but not limited to, site preparation, cleaning, grading, excavation, landscape establishment in association with construction of the bridge and widened roadway and other project features which could result in impacts to sensitive biological resources as identified in the LCD and on the RRME. The RIC and/or QBM are responsible for notifying the PQB/PRS of changes to any approved construction plans, procedures, and/or activities. The PQB/PRS is responsible to notify the CM, LA, RE, BI and MMC of the changes.
    2. The PQB or QBM shall document field activity via the Consultant Site Visit Record Forms (CSVR). The CSVR's shall be faxed by the CM the first day of monitoring, the last day of monitoring, monthly, and in the event that there is a deviation from conditions identified within the LCD and/or biological monitoring program. The RE shall forward copies to MMC.
    3. The PQB or QBM shall be responsible for maintaining and submitting the CSVR at the time that CM responsibilities end (i.e., upon the completion of construction activity other then that of associated with biology).
    4. All construction activities (including staging areas) shall be restricted to the development areas as shown on the LCD. The PQB/PRS or QBM staff shall monitor construction activities as needed, with MMC concurrence on method and schedule. This is to ensure that construction activities do not encroach into biologically sensitive areas beyond the limits of disturbance as shown on the approved LCD.
    5. The PQB or QBM shall supervise the placement of orange construction fencing or City approved equivalent, along the limits of potential disturbance adjacent to (or at the edge of) all sensitive habitats, including disturbed southern willow scrub, disturbed mule-fat scrub, disturbed coastal brackish marsh, disturbed southern coastal salt marsh, and disturbed Diegan coastal sage scrub, as shown on the approved LCD.

6. The PBQ shall provide a letter to MMC stating that the approved limits of disturbance have been surveyed, staked, and that the construction fencing is installed properly.
7. The PQB or QBM shall oversee implementation of BMP's, such as gravel bags, straw logs, silt fences or equivalent erosion control measures, as needed to ensure prevention of any significant sediment transport. In addition, the PQB/QBM shall be responsible to verify the removal of all temporary construction BMP's upon completion of construction activities. Removal of temporary construction BMP's shall be verified in writing on the final construction phase CSVR.
8. PQB shall verify in writing on the CSVR's that no trash stockpiling or oil dumping, fueling of equipment, storage of hazardous wastes or construction equipment/material, parking or other construction related activities shall occuradjacent to sensitive habitat. These activities shall occur only within the designated staging area located outside the area defined as biological sensitive area.
9. The long-term establishment inspection and reporting schedule per LCD must all be approved by MMC prior to the issuance of the Notice of Completion (NOC) or any bond release.

B. Disturbance/Discovery Notification Process

1. If unauthorized disturbances occurs or sensitive biological resources are discovered that were not previously identified on the LCD and/or RRME, the PQB or QBM shall direct the contractor to temporarily divert construction in the area of disturbance or discovery and immediately notify the RE or BI, as appropriate.
2. The PQB shall also immediately notify MMC by telephone of the disturbance and report the nature and extent of the disturbance and recommend the method of additional protection, such as fencing and appropriate Best Management Practices (BMP's). After obtaining concurrence with MMC and the RE, PQB and CM shall install the approved protection and agreement on BMP's.
3. The PQB shall also submit written documentation of the disturbance/discovery to MMC within 24 hours by fax or email. The PQB shall evaluate the significance of disturbance and/or discovered biological resource and provide a detailed analysis and recommendation in a letter report with the appropriate photo documentation (e.g., show adjacent vegetation) to MMC to obtain concurrence and formulate a plan of action which can include fines, fees, and supplemental mitigation costs.
   a. MMC shall review this letter report and provide the RE with MMC's recommendations and procedures.

C. Plant Establishment Period Maintenance and Monitoring

1. The Revegetation Installation Contractor (RIC), Revegetation Maintenance Contractor (RMC), Construction Manager (CM) and Grading Contractor (GC), where applicable shall be responsible to insure for all grading and contouring, clearing and grubbing, installation of plant materials, and any necessary maintenance activities or remedial actions required during installation and the 120 day plant

establishment period are done per approved LCD. The following procedures at a minimum, not limited to, shall be performed:

a. Upon Installation completion, the PQB shall review the mitigation area to assess completion of installation and submit a letter report to MMC requesting an installation inspection. MMC will schedule inspection after review of report.
b. The RMC shall be responsible for the maintenance of the mitigation area for a minimum period of 120 days. Maintenance visits shall be conducted on a weekly basis throughout the plant establishment period.
c. At the end of the 120-day period the PQB shall review the mitigation area to assess the completion of the short-term plant establishment period (PEP) and submit a report for approval by MMC. A request for inspection of the completed 120-day PEP shall be submitted at this time; MMC will schedule after review of report.
d. MMC will provide approval in writing to begin the five year long-term establishment/maintenance and monitoring program.
e. Existing indigenous/native species shall not be pruned, thinned or cleared in the revegetation/mitigation area.
f. The revegetation site shall not be fertilized.
g. The RIC is responsible for reseeding (if applicable) if weeds are not removed, within one week of written recommendation by the PQB.
h. Weed control measures shall include the following: (1) hand removal, (2) cutting, with power equipment, and (3) chemical control. Hand removal of weeds is the most desirable method of control and will be used wherever possible.
i. Damaged areas shall be repaired immediately by the RIC/RMC. Insect infestations, plant diseases, herbivory, and other pest problems will be closely monitored throughout the five-year maintenance period. Protective mechanism such as metal wire netting shall be used as necessary. Diseased and infected plants shall be immediately disposed of off-site in a legally-acceptable manner at the discretion of the PQB or Qualified biological Monitor (QBM) (City approved). Where possible, biological controls will be used instead of pesticides and herbicides.

Post Construction

A. Mitigation Monitoring and Reporting Period

I. Five-Year Mitigation Establishment/Maintenance Period

a. The RMC shall be retained to complete maintenance monitoring activities throughout the five-year mitigation monitoring period.
b. Maintenance visits will be conducted twice per month for the first six months, once per month for the remainder of the first year, and quarterly thereafter.
c. Maintenance activities will include all items described in the LCD.
d. Plant replacement will be conducted as recommended by the PQB (note:

plants shall be increased in container size relative to the time of initial installation or establishment or maintenance period may be extended to the satisfaction of MMC.

2. Five-Year Biological Monitoring

   a. All biological monitoring and reporting shall be conducted by a PQB or QBM, as appropriate, consistent with the LCD.

   b. Monitoring shall involve both qualitative horticultural monitoring and quantitative monitoring (i.e., performance/success criteria). Horticultural monitoring shall focus on soil conditions (e.g., moisture and fertility), container plant health, seed germination rates, presence of native and non-native (e.g., invasive exotic) species, any significant disease or pest problems, irrigation repair and scheduling, trash removal, illegal trespass, and any erosion problems.

   c. After the 120-day PEP is complete, qualitative monitoring surveys will occur monthly during year one and quarterly during years two through five.

   d. Upon the completion of the 120-day PEP, quantitative monitoring surveys shall be conducted at 0, 6, 12, 24, 36, 48 and 60 months by the PQB or QBM. The revegetation/restoration effort shall be quantitatively evaluated once per year (in spring) during years three through five, to determine compliance with the performance standards identified on the LCD. All plant material must have survived without supplemental irrigation for the last two years prior to acceptance.

   e. Quantitative monitoring shall include the use of fixed transects and photo points to determine the vegetative cover within the revegetated habitat. Collection of fixed transect data within the revegetation/restoration site shall result in the calculation of percent cover for each plant species present, percent cover of target vegetation, tree height and diameter at breast height (if applicable) and percent cover of non-native/non invasive vegetation. Container plants will also be counted to determine percent survivorship. The data will be used to determine attainment of performance/success criteria identified within the LCD.

   f. Biological monitoring requirements may be reduced if, before the end of the fifth year, the revegetation meets the fifth year criteria and the irrigation has been terminated for a period of the last two years.

   g. The PQB or QBM shall oversee implementation of post-construction BMP's, such as gravel bags, straw logs, silt fences or equvalent erosion control measures, as needed to ensure prevention of any significant sediment transport. In addition, the PBQ/QBM shall be responsible to verify the removal of all temporary post-construction BMP's upon completion of construction activities. Removal of temporary post-construction BMPs shall be verified in writing on the final post-construction phase CSVR.

C. Submittal of Draft Monitoring Report

1. Upon completion of landscape installation, the PQB shall submit a letter report notifying MMC of the completion of landscape installation. This report shall address any deviations from the approved project LCDs.
2. A draft monitoring letter report shall be prepared to document the completion of the 120-day plant establishment period. The report shall include discussion on weed control, horticultural treatments (pruning, mulching, and disease control), erosion control, trash/debris removal, replacement planting/reseeding, site protection/signage, pest management, vandalism, and irrigation maintenance. The revegetation/restoration effort shall be visually assessed at the end of the120-day period to determine mortality of individuals.
3. The PQB shall submit two copies of the Draft Monitoring Report which describes the results, analysis, and conclusions of all phases of the Biological Monitoring and Reporting Program (with appropriate graphics) to MMC for review and approval within 30 days following the completion of monitoring. Monitoring reports shall be prepared on an annual basis for a period of five years. Site progress reports shall be prepared by the PQB following each site visit and provided to the owner, RMC and RIC. Site progress reports shall review maintenance activities, qualitative and quantitative (when appropriate) monitoring results including progress of the revegetation relative to the performance/success criteria, and the need for any remedial measures.
4. Draft annual reports (three copies) summarizing the results of each progress report including quantitative monitoring results and photographs taken from permanent viewpoints shall be submitted to MMC for review and approval within 30 days following the completion of monitoring.
5. MMC shall return the Draft Monitoring Report to the PQB for revision or, for preparation of each report.
6. The PQB shall submit revised Monitoring Report to MMC (with a copy to RE) for approval within 30 days.
7. MMC will provide written acceptance of the PQB and RE of the approved report.

D. Final Monitoring Reports(s)

1. PQB shall prepare a Final Monitoring upon achievement of the fifth year performance/success criteria and completion of the five year maintenance period.
    a. This report may occur before the end of the fifth year if the revegetation meets the fifth year performance /success criteria and the irrigation has been terminated for a period of the last two years.
    b. The Final Monitoring report shall be submitted to MMC for evaluation of the success of the mitigation effort and final acceptance. A request for a pre-final inspection shall be submitted at this time, MMC will schedule after review of report.
    c. If at the end of the five years any of the revegetated area fails to meet the project's final success standards, the applicant must consult with MMC. This consultation shall take place to determine whether the revegetation effort is

acceptable. The applicant understands that failure of any significant portion of the revegetation/restoration area may result in a requirement to replace or renegotiate that portion of the site and/or extend the monitoring and establishment/maintenance period until all success standards are met.

Existing Biological Resources

The following mitigation measures address the avoidance of sensitive biological resources occurring on-site.

1. Prior to bid opening/bid award, the transportation and drainage design diversion shall obtain all agency permits.

2. Construction in the river corridor will be prohibited from February 15 to September 15, which encompasses the breeding season of the light-footed clapper rail and the least Bell's vireo.

3. Prior to the start of construction, the project biologist shall supervise the placement of orange construction fencing or equivalent along the limits of disturbance within and surrounding sensitive habitats as shown on the approved plans to protect adjacent environmentally sensitive lands (ESL) including sensitive upland and wetland habitat. This will include DCSS on the staging area to avoid impacts.

4. All construction activities (including staging areas) shall be restricted to the development area as shown on the approved plan. The project biologist shall monitor construction activities as needed to ensure that construction activities do not encroach into biologically sensitive areas beyond the limits of disturbance as shown on the approved plan.

5. After completion of construction, permanent low-sodium lighting will be used along the El Camino Real bridge. Such lighting will be directed away from the MHPA and areas that might be used for wildlife movement.

IX. D. Management Element

Long-term maintenance and management of the lands preserved or restored will be the responsibility of the City, a designated agent of the City or the property owner, the JPA. The project is consistent with the Preserve Management section of the City's MSCP Subarea plan which directs the management of resources within the preserve. Any future management activities required for compliance with the subarea plan will occur at the discretion of the City.

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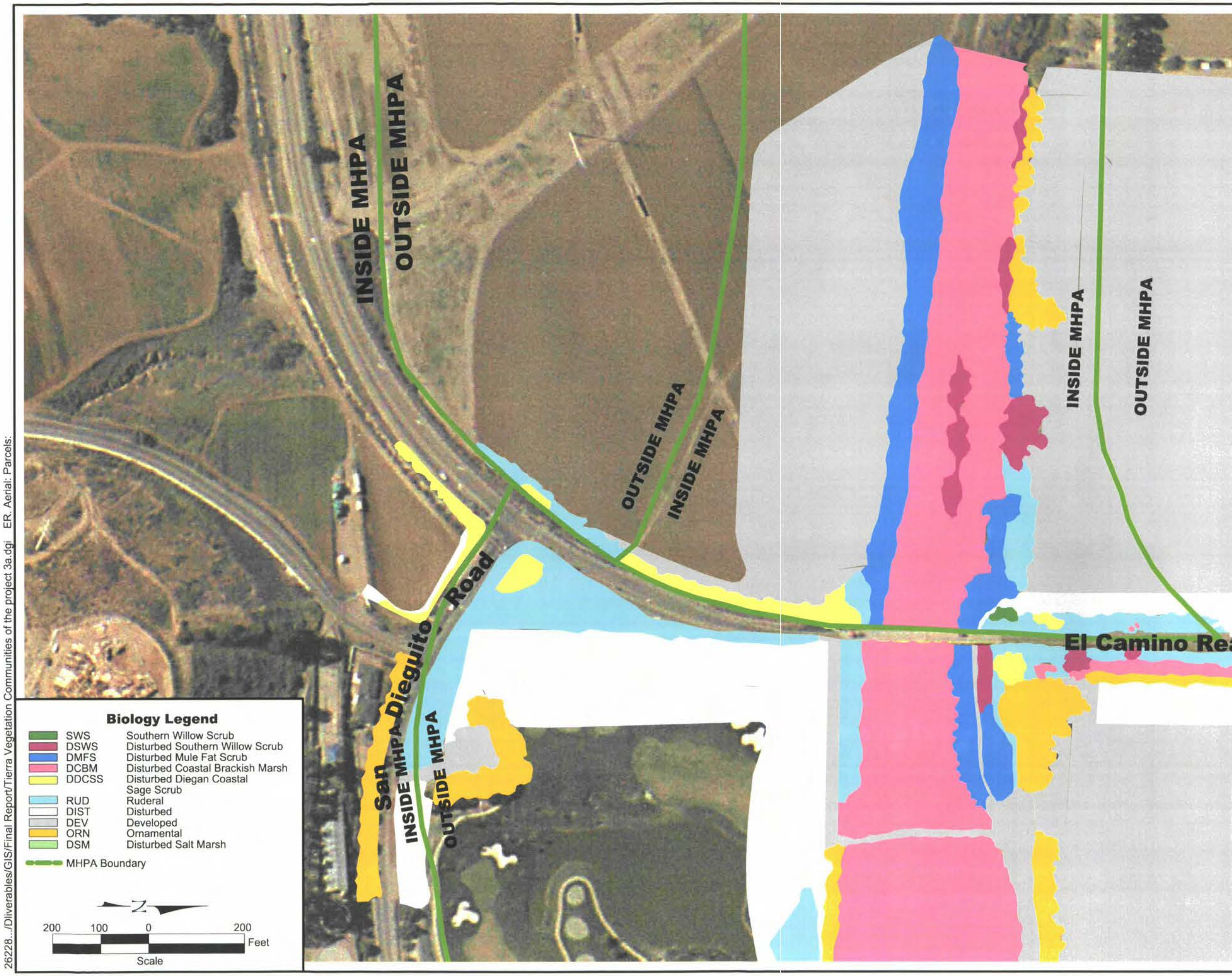
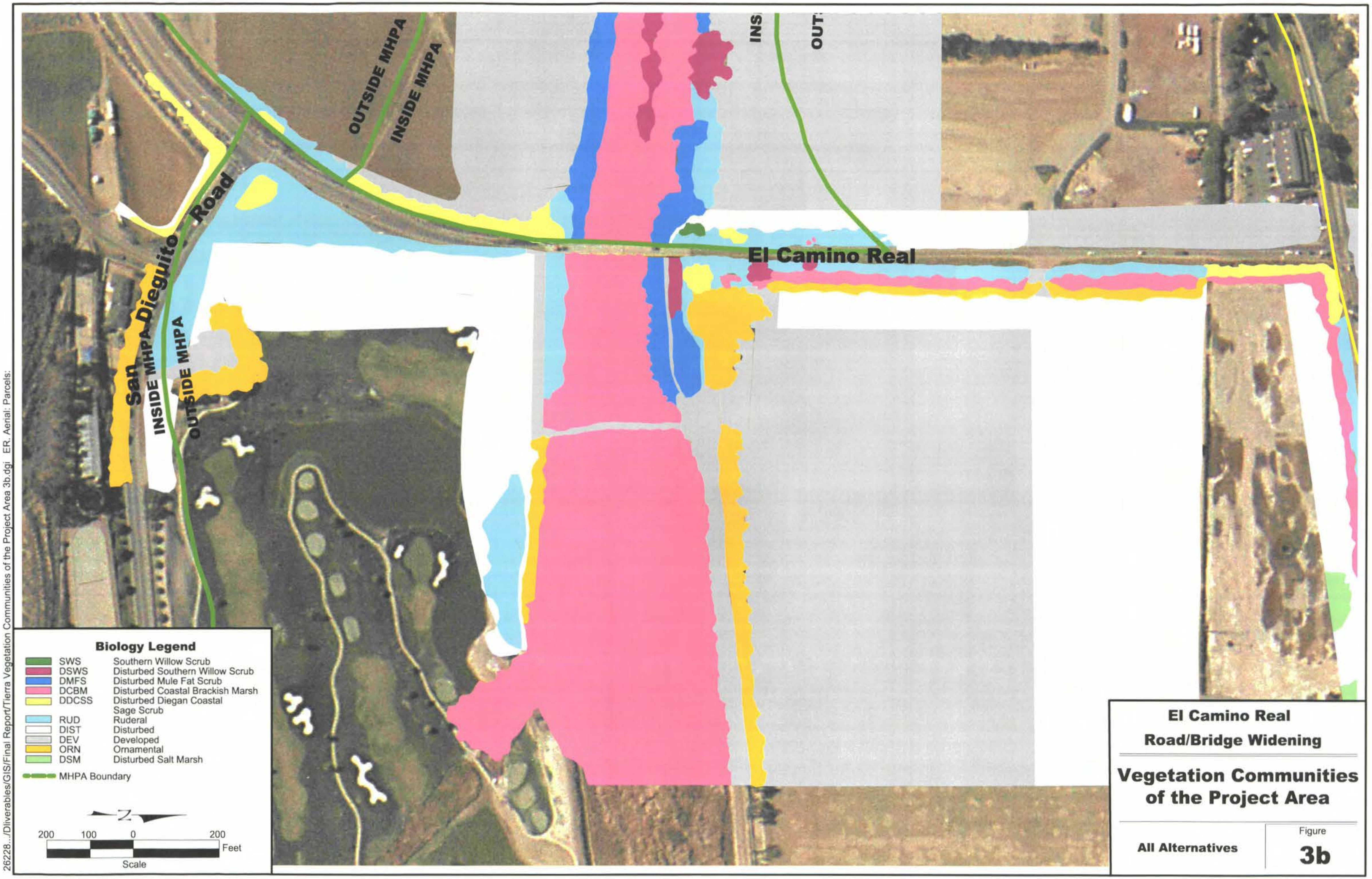


El Camino Real Road/Bridge Widening

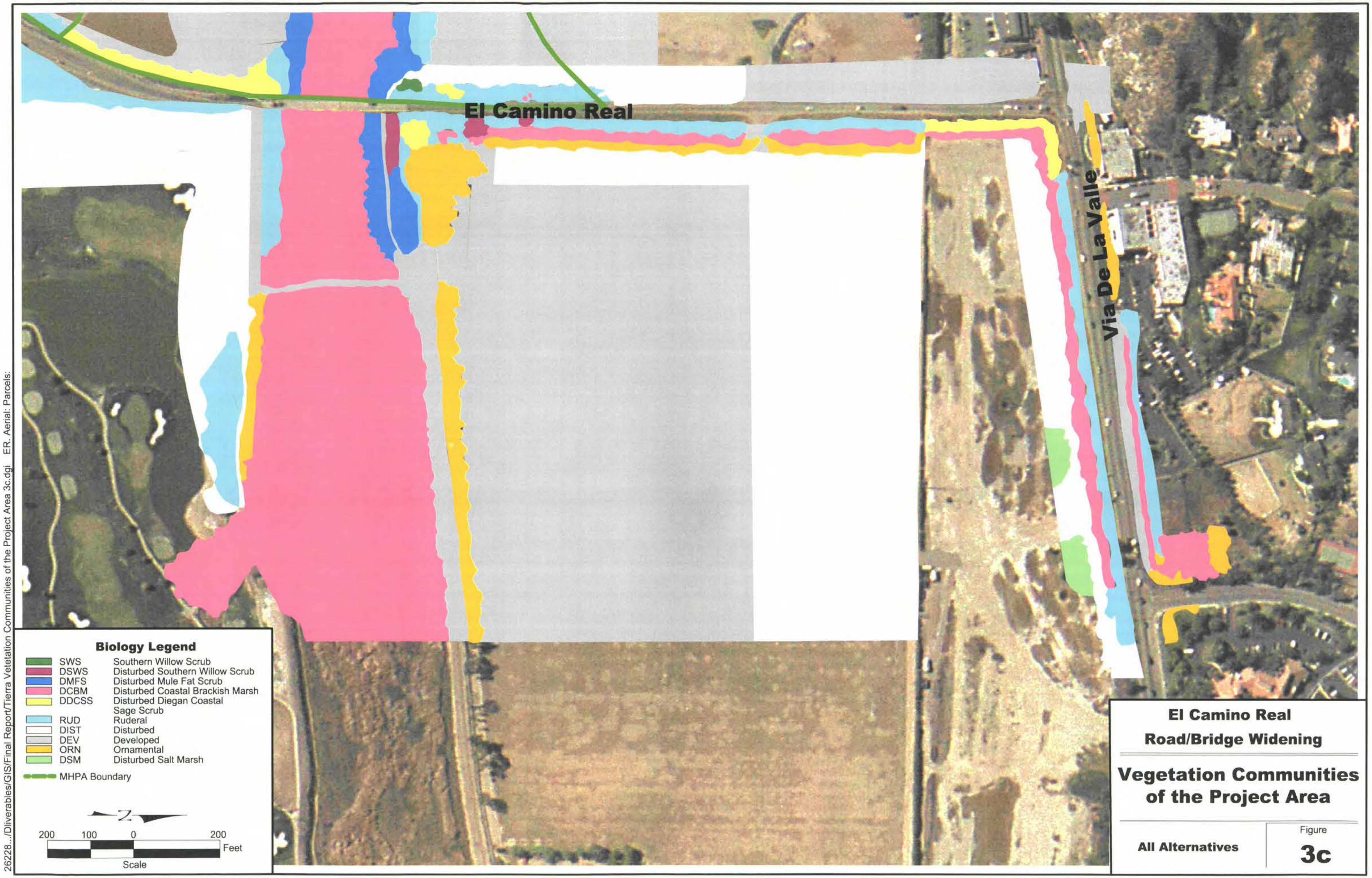
Vegetation Communities of the Project Area

All Alternatives

Figure **3a**



OUTSIDE MHPA
INSIDE MHPA
INS
OUT
San Dieguito Road
INSIDE MHPA
OUTSIDE MHPA
El Camino Real
Biology Legend
SWS Southern Willow Scrub
DSWS Disturbed Southern Willow Scrub
DMFS Disturbed Mule Fat Scrub
DCBM Disturbed Coastal Brackish Marsh
DDCSS Disturbed Diegan Coastal Sage Scrub
RUD Ruderal
DIST Disturbed
DEV Developed
ORN Ornamental
DSM Disturbed Salt Marsh
MHPA Boundary
N
200 100 0 200
Feet
Scale
El Camino Real
Road/Bridge Widening
Vegetation Communities of the Project Area
All Alternatives
Figure
3b
26228.../Diverables/GIS/Final Report/Tierra Vegetation Communities of the Project Area 3b.dgi ER. Aerial: Parcels:



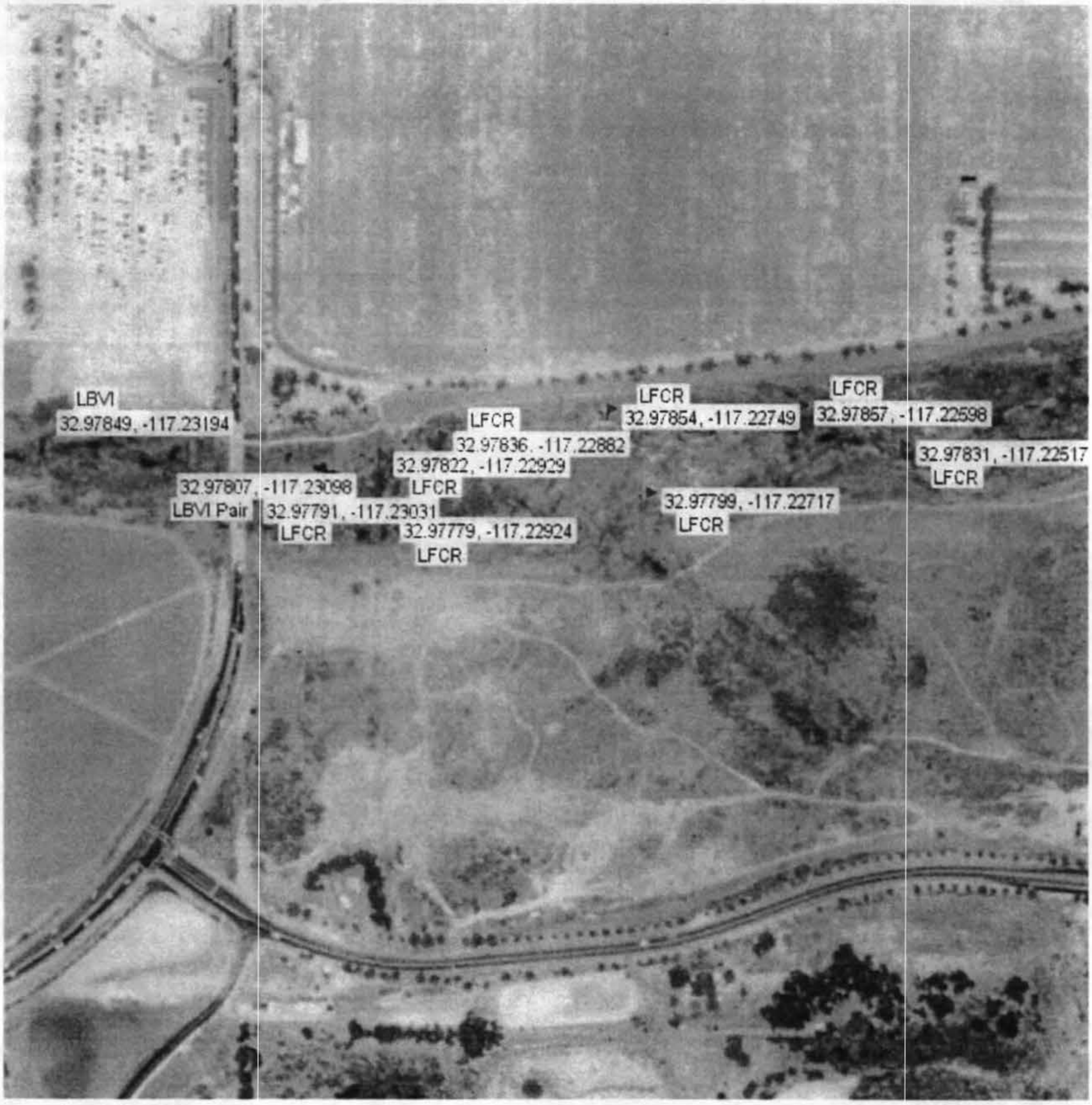
El Camino Real
Road/Bridge Widening

Vegetation Communities of the Project Area

All Alternatives

Figure **3c**

26228.../Diliverables/GIS/Final Report/Tierra Vetetation Communities of the Project Area 3c.dgi ER. Aerial: Parcels:



SOURCE: Varanus Monitoring Services, Inc.

Figure 4

Aerial View of Least Bell's Vireos (LBVI) and Light-Footed Clapper Rails (LFCR) Locations Along the San Dieguito River in the Vicinity of El Camino Real, Del Mar, California

N

Not to Scale

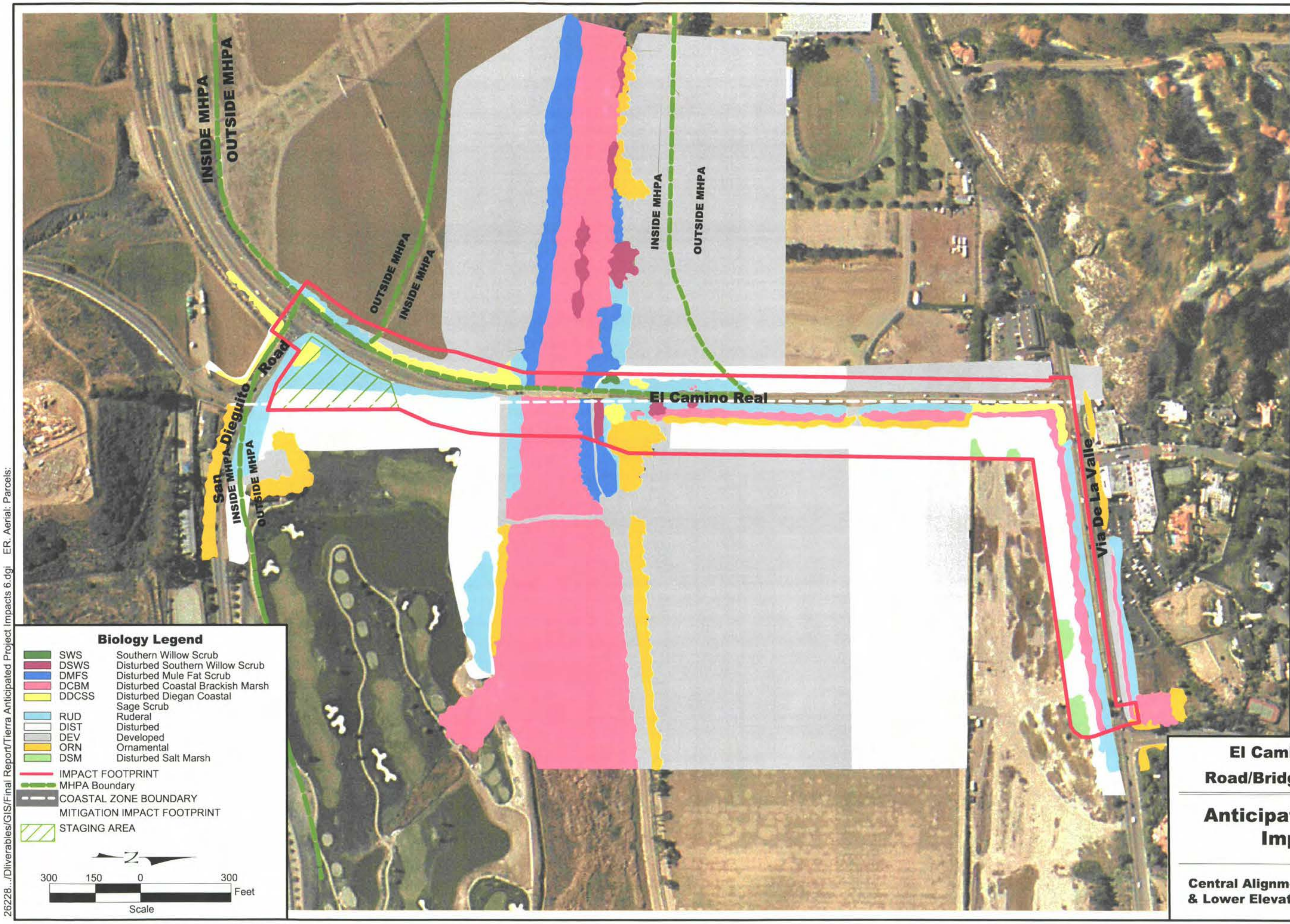
TIERRA
ENVIRONMENTAL SERVICES

El Camino Real
Road/Bridge Widening

Proposed Projects in the Vicinity

Figure 5

26228...Dlev.../GIS/El Camino.apr

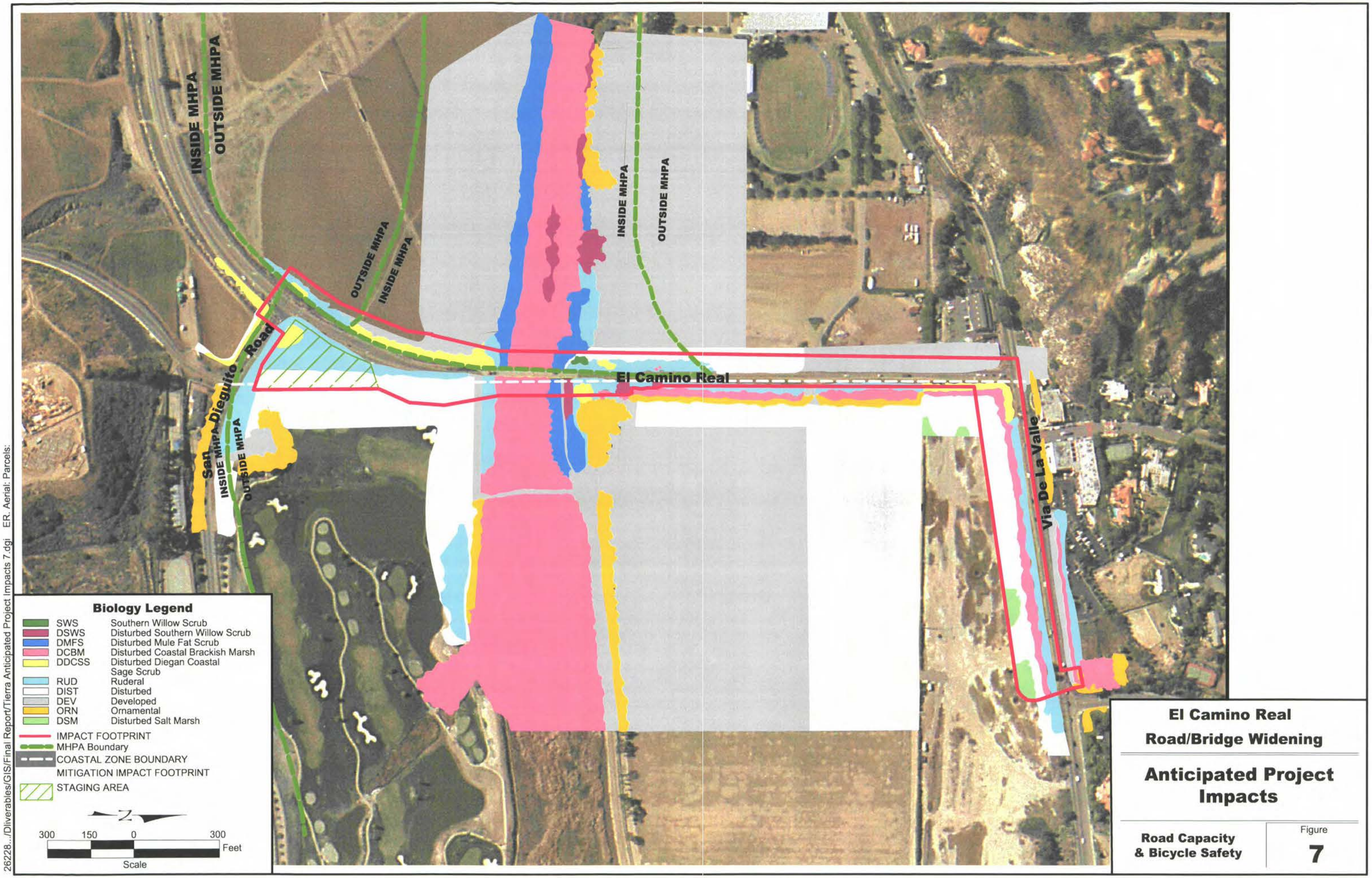


El Camino Real Road/Bridge Widening

Anticipated Project Impacts

Central Alignment & Lower Elevation

Figure **6**



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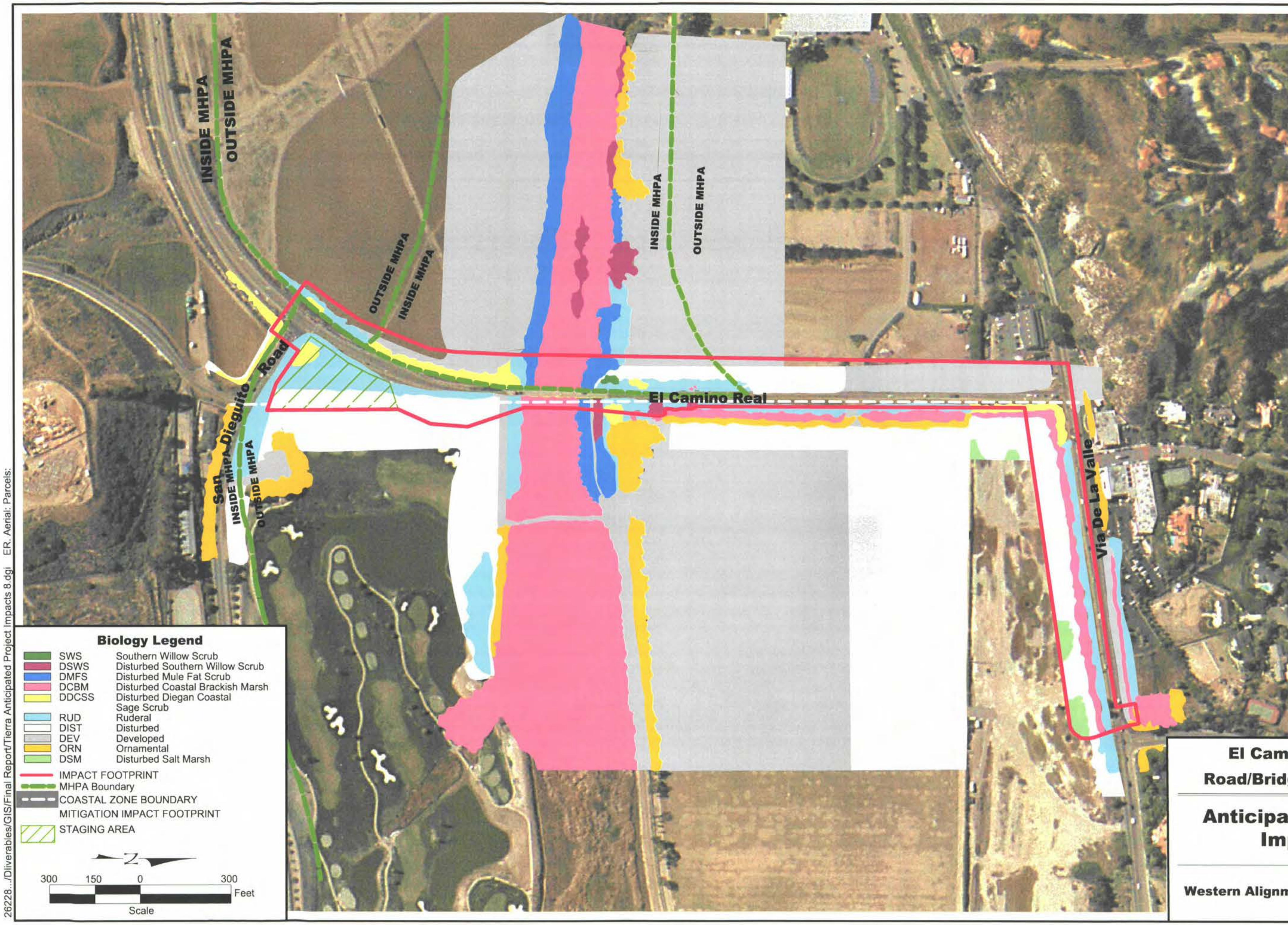


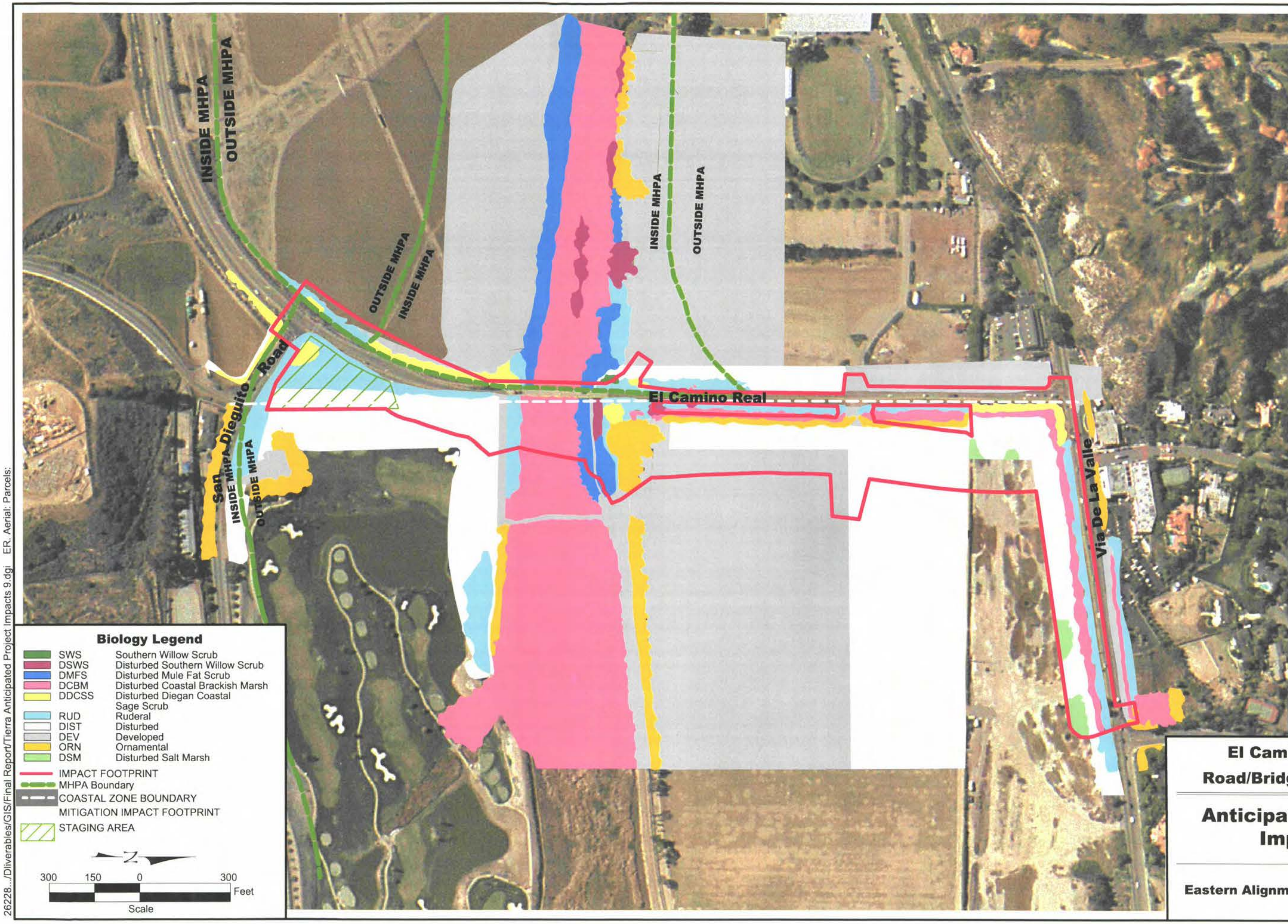
El Camino Real
Road/Bridge Widening

Anticipated Project Impacts

Western Alignment

Figure **8**

26228.../Diliverables/GIS/Final Report/Tierra Anticipated Project Impacts 8.dgi ER. Aerial: Parcels:



El Camino Real

Road/Bridge Widening

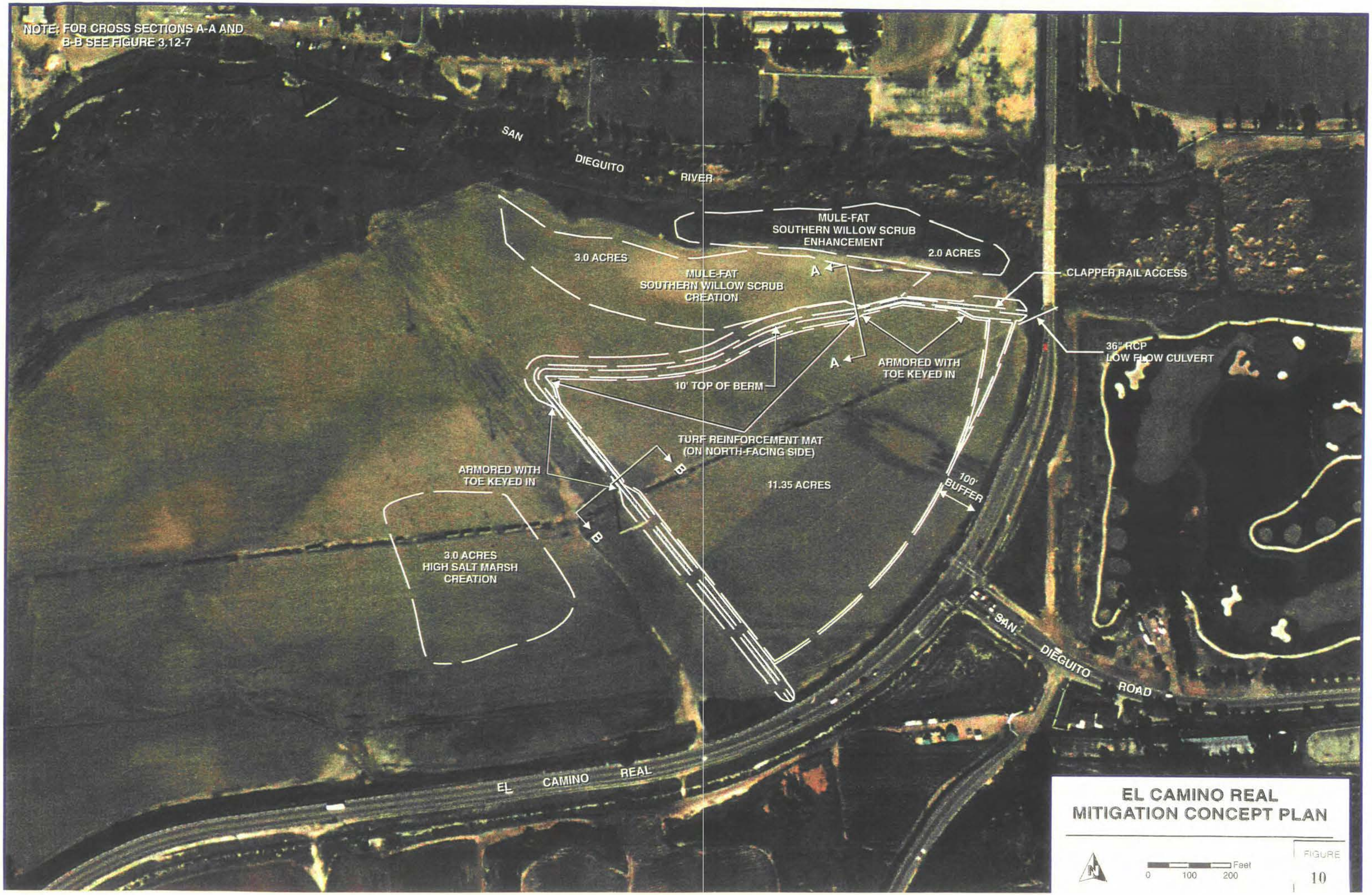
Anticipated Project Impacts

Eastern Alignment

Figure

9

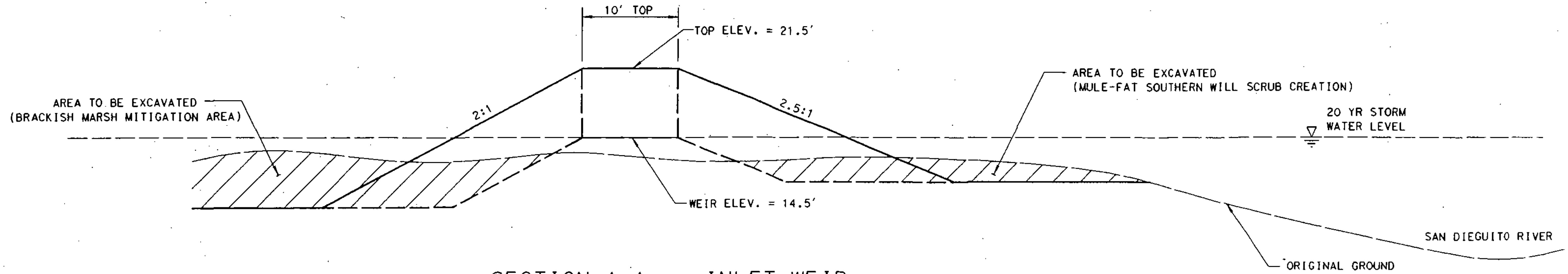
26228.../Diverables/GIS/Final Report/Tierra Anticipated Project Impacts 9.dgi ER. Aerial: Parcels:



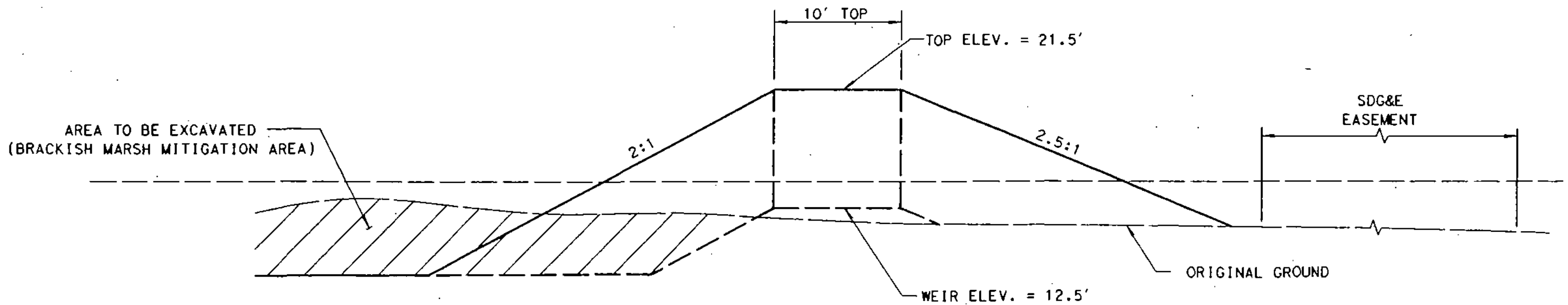
EL CAMINO REAL MITIGATION CONCEPT PLAN

FIGURE 10

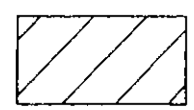
NOTE: SEE PLAN VIEW (FIG 3-12.6) FOR SLOPE PROTECTION



SECTION A-A - INLET WEIR



SECTION B-B - OUTLET WEIR



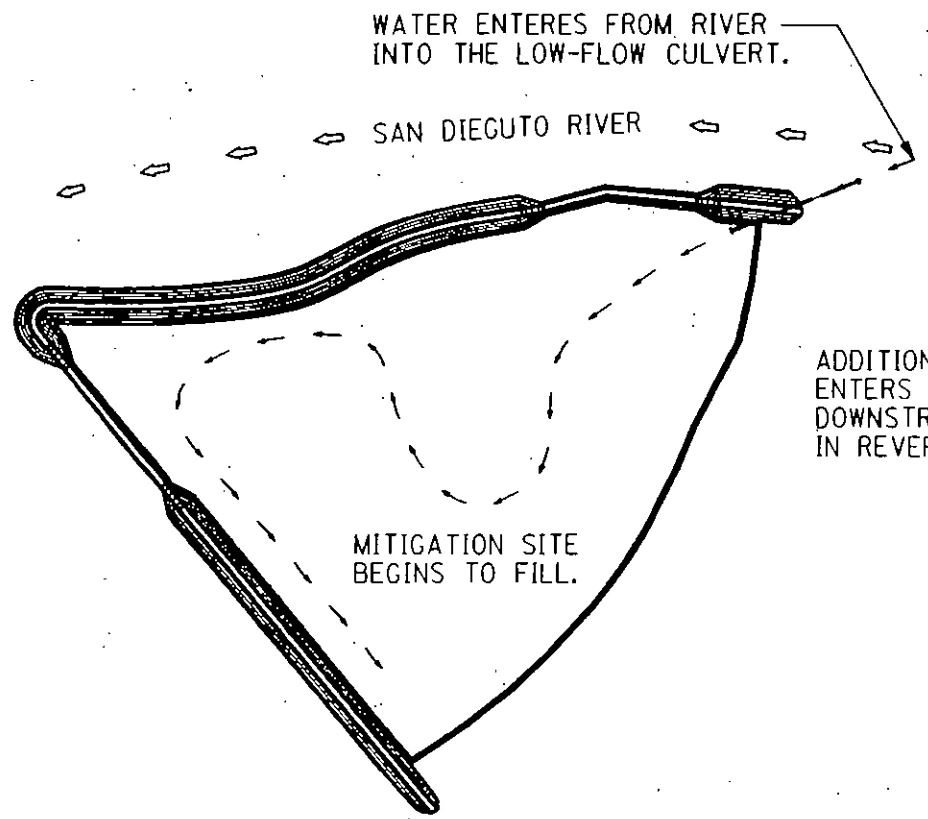
MITIGATION AREA

El Camino Real
Road / Bridge Widening

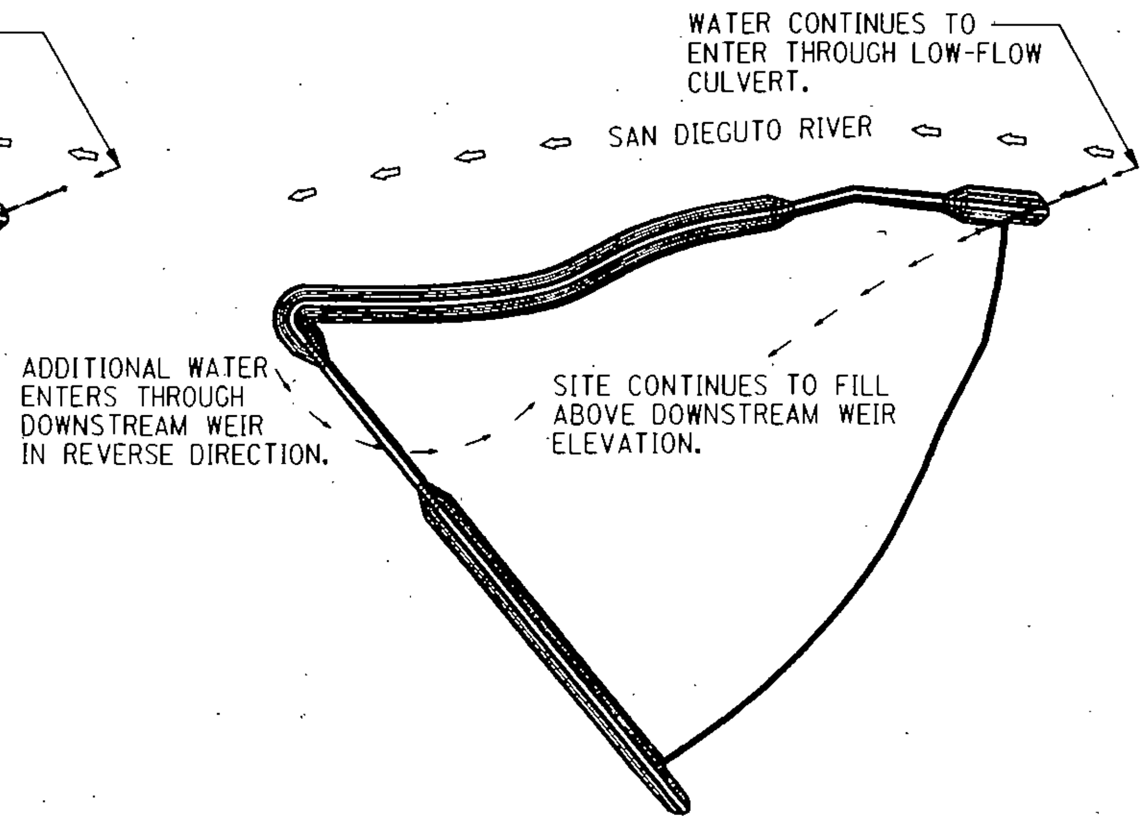
Mitigation Site
Cross Sections

JOB NO. 14752
FILE: [illegible]
DATE: NOVEMBER, 2005

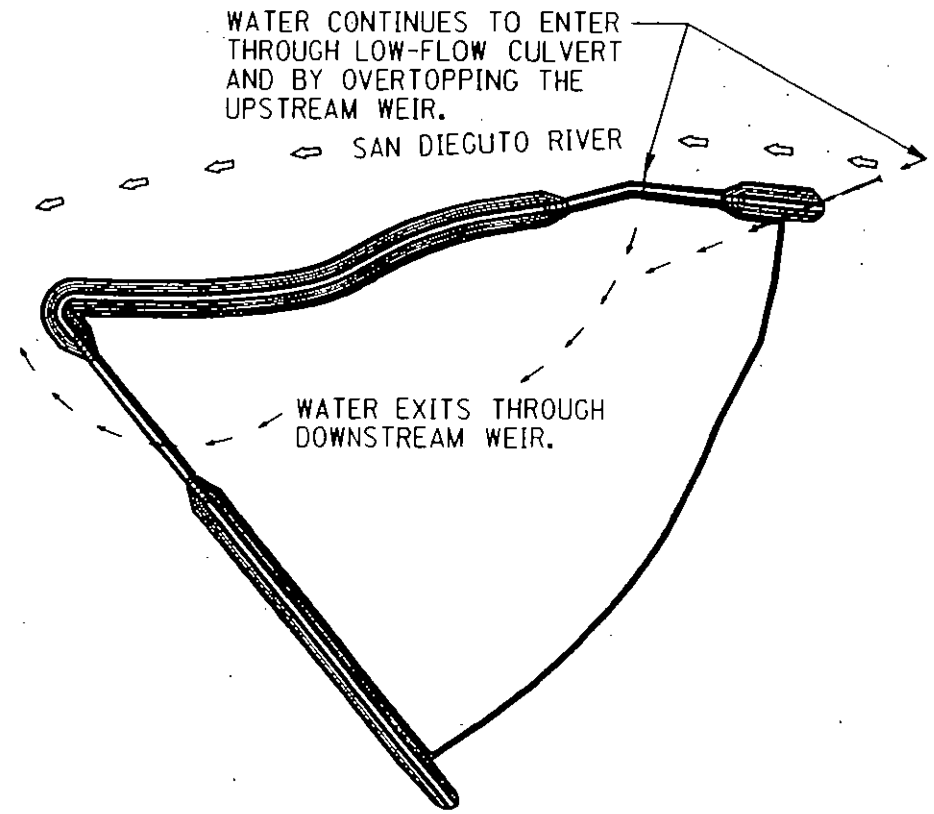
Figure
11



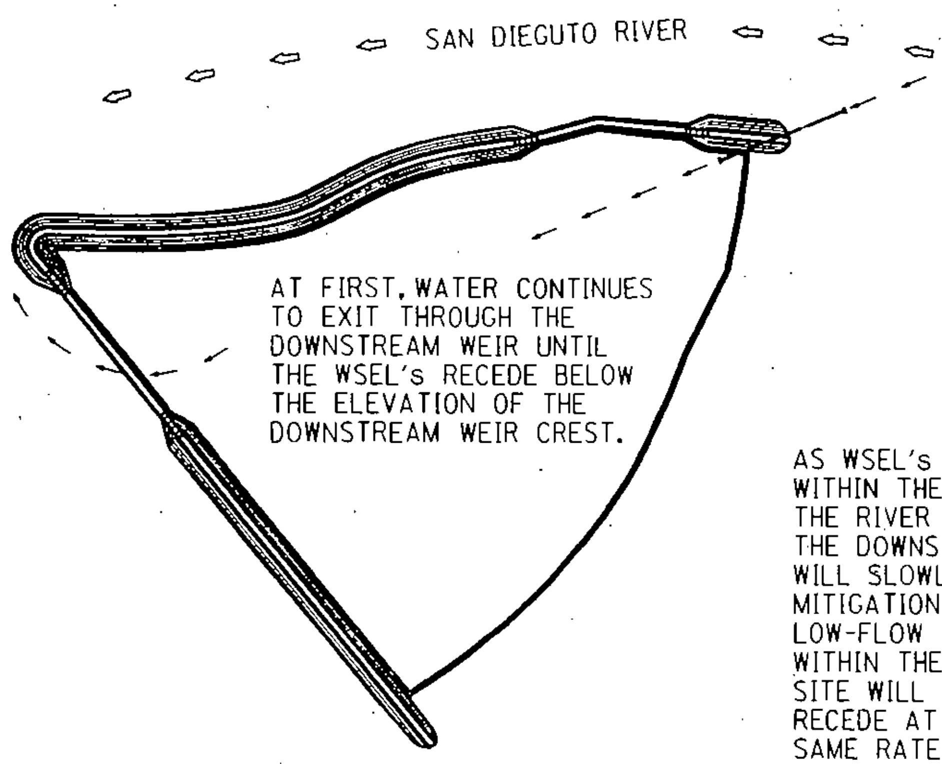
STAGE 1
BEGINNING OF A STORM EVENT



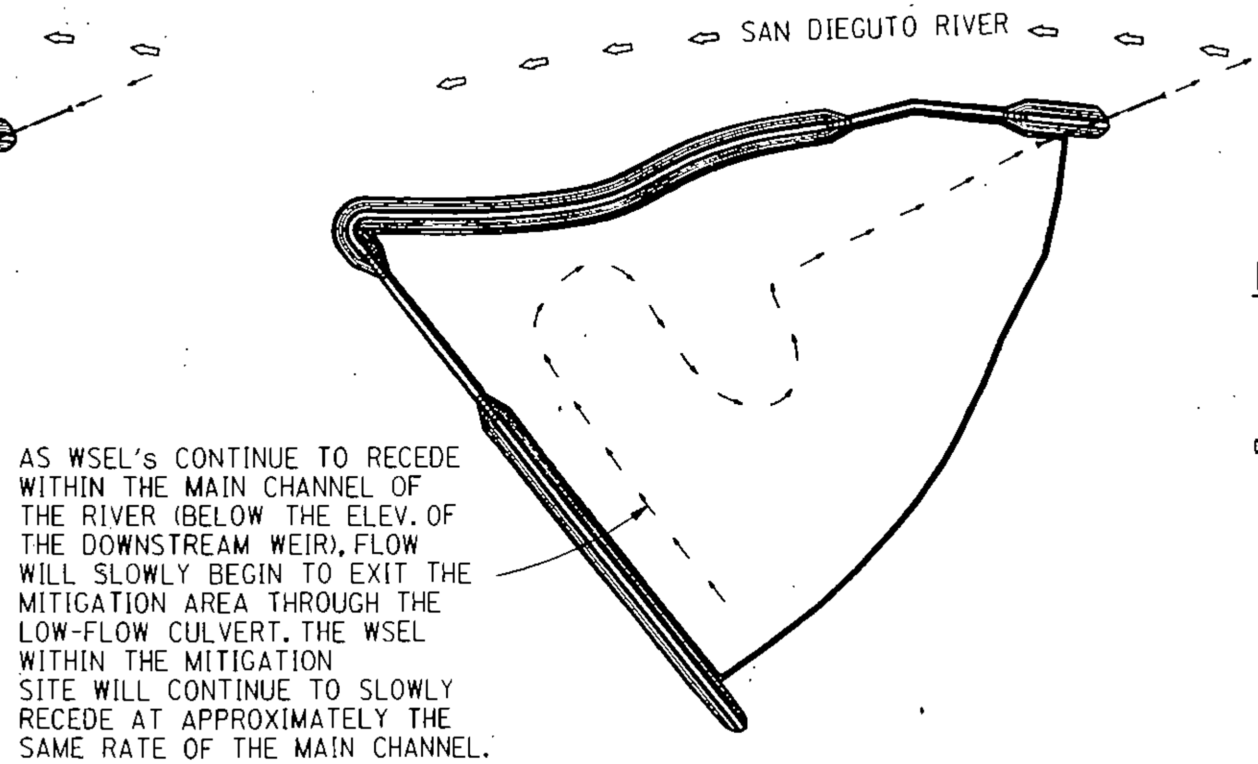
STAGE 2
WHEN THE WSEL OF THE RIVER REACHES THE ELEVATION OF THE DOWNSTREAM WEIR.



STAGE 3
WHEN THE WSEL OF THE RIVER REACHES THE ELEVATION OF THE UPSTREAM WEIR.



STAGE 4
WSEL OF THE RIVER DROPS BELOW THE ELEVATION OF THE UPSTREAM WEIR.



STAGE 5
WSEL OF THE RIVER REACHES THE ELEVATION OF THE DOWNSTREAM WEIR AND CONTINUES TO RECEDE.

LEGEND

DIRECTION OF FLOW
RIVER
LOW-FLOW CULVERT

N

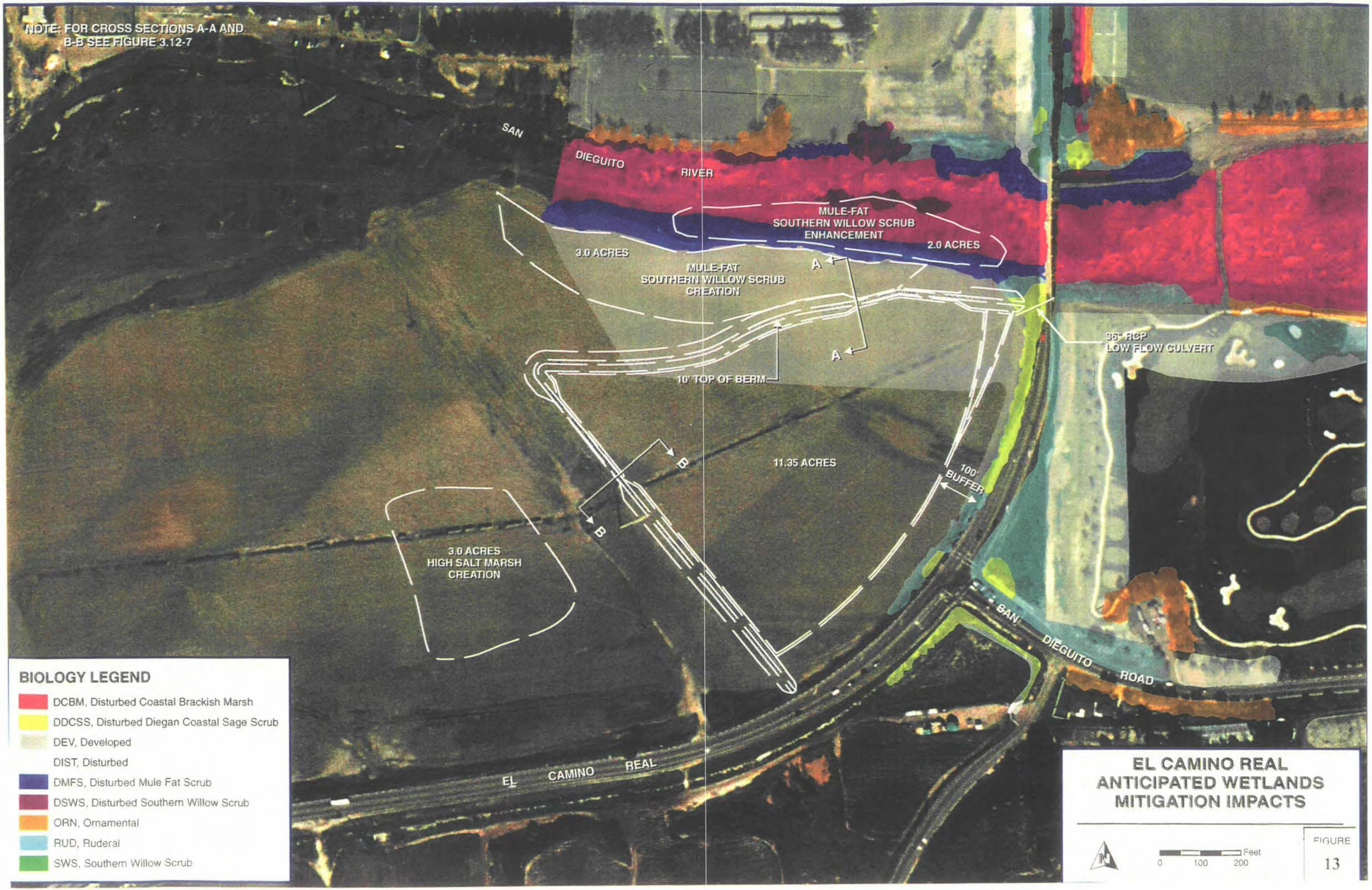
SCALE 1:300

RICK ENGINEERING COMPANY
5620 FRIARS ROAD
SAN DIEGO, CA 92110
619.291.0707
(FAX)619.291.4165

El Camino Real
Road / Bridge Widening

Exhibit Showing
Mitigation Flow Stages 1 to 5

Figure
12



EL CAMINO REAL ANTICIPATED WETLANDS MITIGATION IMPACTS

FIGURE 13

Attachment A. Plant Species Observed in the El Camino Real Road/Bridge Widening Project Area

Scientific Name	Common Name
Dicots	
AIZOACEAE Fig-Marigold Family	
Carpobrotus edulis	Hottentot fig
Mesembryanthemum crystallinum	crystalline iceplant
Mesembryanthemum nodiflorum	slender-leaved iceplant
AMARANTHACEAE Amaranth Family	
Amaranthus albus	tumbleweed
ANACARDIACEAE Sumac Family	
Rhus integrifolia	lemonadeberry
APIACEAE Carrot Family	
Apium graveolens	wild celery
Foeniculum vulgare	sweet fennel
Perideridia parishii	southern yumpah
ASTERACEAE Sunflower Family	
Ambrosia psilostachya	western ragweed
Artemisia californica	California sagebrush
Artemisia douglasiana	Douglas mugwort
Artemisia palmeri	Palmer sagewort
Baccharis salicifolia	mule-fat
Baccharis sarothroides	broom baccharis
Centaurea calcitrapa	purple star-thistle
Centaurea melitensis	tocalote
Chrysanthemum coronarium	garland
Cirsium sp.	bull thistle
Conyza canadensis	horseweed
Cotula coronopifolia	brass buttons
Cynara cardunculus	artichoke thistle
Encelia californica	California encelia
Gnaphalium palustre	lowland cudweed
Heterotheca grandifolia	telegraphweed
Hypochaeris glabra	smooth cat's ear
Isocoma menziesii	goldenbush
Lactuca serriola	wild lettuce
Picris echioides	bristly ox-tongue
Pluchea sericea	arrow weed
Sonchus oleraceus	common sow thistle
Viguiera laciniata	San Diego County viguiera
Xanthium strumarium	cocklebur
BORAGINACEAE Borage Family	
Heliotropium curvassavicum	salt heliotrope
BRASSICACEAE Mustard Family	
Coronopus didymus	swinecress
Brassica rapa	field mustard

Attachment A (continued). Plant Species Observed in the El Camino Real Road/Bridge Widening Project Area

Scientific Name	Common Name
Hirschfeldia incana	short-pod mustard
Lepidium sp.	peppergrass
Raphanus sativus	wild radish
CHENOPODIACEAE Goosefoot Family	
Atriplex semibaccata	Australian saltbush
Atriplex triangularis	spearscale
Chenopodium sp.	goosefoot
Chenopodium album	pigweed
Salicornia virginica	pickleweed
Salsola tragus	Russian thistle
Suaeda esteroa	California sea-blite
EUPHORBIACEAE Spurge Family	
Ricinus communis	castor bean
FABACEAE Pea Family	
Acacia sp.	acacia
Lotus purshianus	Spanish-clover
Lotus scoparius	deerweed
Melilotus officinalis	yellow sweetclover
FRANKENIACEAE Frankenia Family	
Frankenia salina	alkali heath
GERANIACEAE Geranium Family	
Erodium cicutarium	red-stemmed filaree
LAMIACEAE Mint Family	
Salvia apiana	white sage
Salvia mellifera	black sage
LYTHRACEAE Loosestrife Family	
Lythrum hyssopifolia	grass poly
MALVACEAE Mallow Family	
Malva parviflora	cheeseweed
Malvella sp.	alkali mallow
MYOPORACEAE Myoporum Family	
Myoporum laetum	ngaio
MYRTACEAE Myrtle Family	
Eucalyptus sp.	eucalyptus
POLYGONACEAE Buckwheat Family	
Eriogonum fasciculatum	California buckwheat
Rumex crispus	curly dock

Attachment A (continued). Plant Species Observed in the El Camino Real Road/Bridge Widening Project Area

Scientific Name	Common Name
PRIMULACEAE Primrose Family	
Anagallis arvensis	scarlet pimpernel
ROSACEAE Rose Family	
Pyrus kawakamii	evergreen pear
SALICACEAE Willow Family	
Salix exigua	narrow-leaved willow
Salix gooddingii	Goodding's black willow
Salix lasiolepis	arroyo willow
SAURURACEAE Lizard's Tail Family	
Anemopsis californica	yerba mansa
SOLANACEAE Nightshade Family	
Datura wrightii	jimson weed
Nicotiana glauca	tree tobacco
TAMARICACEAE Tamarisk Family	
Tamarix ramosissima	tamarisk
URTICACEAE Nettle Family	
Urtica dioica ssp. *holosericea*	hoary nettle
Monocots	
ARECACEAE Palm Family	
Phoenix canariensis	Canary Island date palm
Washingtonia robusta	Mexican fan palm
CYPERACEAE Sedge Family	
Cyperus sp.	sedge
Cyperus esculentus	yellow nutsedge
Scirpus americanus	Olney's bulrush
Scirpus californicus	California rush
Scirpus maritimus	bulrush
JUNCACEAE Juncus Family	
Juncus acutus	spiny rush
Juncus mexicanus	Mexican rush
POACEAE Grass Family	
Arundo donax	giant reed
Avena sp.	wild oat
Bromus diandrus	ripgut grass
Bromus hordeaceus	soft chess
Bromus madritensis ssp. *rubens*	foxtail chess
Bromus tectorum	cheat grass
Cortaderia selloana	pampas grass
Cynodon dactylon	Bermuda grass

Attachment A (continued). Plant Species Observed in the El Camino Real Road/Bridge Widening Project Area

Scientific Name	Common Name
Distichlis spicata	salt grass
Hordeum murinum ssp. *leporinum*	hare barley
Lamarckia aurea	golden-top
Leptochloa uninervia	Mexican sprangletop
Lolium triticoides	Italian ryegrass
Polypogon monspeliensis	annual beard grass
Taeniatherum caput-medusae	medusahead
TYPHACEAE Cattail Family	
Typha domingensis	southern cattail

Attachment B. Wildlife Species Observed in the El Camino Real Road/Bridge Widening Project Area

Scientific Name	Common Name	Number Observed/Habitat
Invertebrates		
ASTACIDAE Crayfish		
Procambarus clarki	crayfish	1/CBM
Amphibians		
HYLIDAE Treefrogs		
Pseudacris regilla	Pacific chorus frog	
IGUANIDAE Iguanids		
Sceloporus occidentalis	western fence lizard	1/DCSS
Birds		
Botaurus lentiginosus	American bittern	1/DCBM
Ardea herodias	great blue heron	1/DCBM
Ardea alba	great egret	1/DCBM
Ardea thula	snowy egret	1/DCBM
Butorides virescens	green heron	1/DCBM
Plegadis chihi	white-faced ibis	1/DCBM
Anas platyrhynchos	mallard	3/DCBM
Anas cyanoptera	cinnamon teal	2/DCBM
Fulica americana	American coot	2/DCBM
Charadrius vociferus	killdeer	1/DIST
Sterna forsteri	Forster's tern	1/DCBM
Circus cyaneus	northern harrier	1/DIST
Buteo lineatus	red-shouldered hawk	1/EUC
Buteo jamaicensis	red-tailed hawk	1/OVR
Callipepla californica	California quail	2/DCSS
Rallus limicola	Virginia rail	1/DCBM
Rallus longirostris levipes	light-footed clapper rail	5P, 7T/DCBM
Zenaida macroura	mourning dove	8/DIST
Aeronatus saxatalis	white throated swift	20/OVR
Chaetura vauxi	Vaux's swift	20/OVR
Calypte anna	Anna's hummingbird	5/DMFS
Selasphorus rufus	rufous hummingbird	1/DMFS
Sayornis nigricans	black phoebe	2/DMFS
Sayornis saya	Say's phoebe	1/DCSS
Myiarchus cinerascens	ash-throated flycatcher	2/ORN
Tyrannus vociferans	Cassin's kingbird	2/DIST
Vireo bellii pusillus	least Bell's vireo	3, 2T/DSWS
Corvus corax	common raven	1/OVR
Corvus brachyrhynchos	American crow	12/OVR
Stelgidopteryx serripennis	northern rough-winged swallow	30/DCBM
Petrochelidon pyrrhonota	cliff swallow	30/OVR
Psaltriparus minimus	bushtit	20/DMFS
Cistothorus palustris	marsh wren	5/DCBM
Sturnus vulgaris	European starling	15/DIST
Phainopepla nitens	phainopepla	2/DCSS
Dendroica petechia	yellow warbler	6/DBM, DSWS

Attachment B (continued). Wildlife Species Observed in the El Camino Real Road/Bridge Widening Project Area

Scientific Name	Common Name	Number Observed/Habitat
Dendroica coronata	Audubon's warbler	10/ORN
Geothlypis trichas	common yellowthroat	12/DMFS
Piranga ludoviciana	western tanager	1/DIST
Guiraca caerulea	blue grossbeak	1/DMFS
Pheucticus melanocephalus	black-headed grosbeak	1/DCSS
Pipilo crissalis	California towhee	2/DCBM
Molothrus ater	brown-headed cowbird	3/DEV
Agelaius phoeniceus	red-winged blackbird	40/DCBM
Euphagus cyanocephalus	Brewer's blackbird	15/DCBM
Icterus cucullatus	hooded oriole	1/DIST
Carpodacus mexicanus	house finch	1/DIST
Carduelis psaltria	lesser goldfinch	9/ALL
Melospiza melodia	song sparrow	2/DIST
Passer domesticus	house sparrow	12/ORN
Mammals		
GEOMYIDAE Pocket Gophers		
Thomomys bottae	Botta's pocket gopher	mound/DCSS
LEPORIDAE Rabbits and Hares		
Sylvilagus audubonii	Audubon's cottontail	1/DCSS
SCIURIDAE Squirrels		
Spermophilus beecheyi	California ground squirrel	1/DCSS

DCSS Disturbed Diegan Coastal Sage Scrub
DMFS Disturbed Mule-fat Scrub
DCBM Disturbed Coastal Brackish Marsh
DSWS Disturbed Southern Willow Scrub
EUC Eucalyptus
OVR Overhead
DIST Disturbed
DEV Developed
ALL All areas listed above

P pair
T territories

Attachment C. Focused Surveys for Bat Species

1927 Fifth Avenue
San Diego, CA 92101-2358
P 619.308.9333 F 619.308 9334
www recon-us com

RECON

March 21, 2006

Mr. Norm Arndt
Rick Engineering Company
5620 Friars Road
San Diego, CA 92110-2596

Reference: Results of the Bat Presence/Absence Survey for the El Camino Real Road and Bridge Widening (RECON Number 4256B)

Dear Mr. Arndt:

This letter describes the results of a bat survey conducted on March 16, 2006 for the El Camino Real Road and Bridge Widening project in San Diego, California. The proposed project includes widening El Camino Real from Via de la Valle to San Dieguito Road and widening or replacing the bridge over the San Dieguito River. The purpose of the survey was to determine whether bats are using the bridge.

The survey was conducted between 5:20 P.M. and 6:30 P.M., the temperature was 60 degrees Fahrenheit, wind speeds ranged from one to five miles per hour, and the sky was mostly clear with a band of clouds on the western horizon. Sunset occurred at 5:57 P.M. The survey methods included visually examining the underside of the bridge for bats and structures that would support bat roosting or nursery sites. The ground below and adjacent to the bridge was also visually examined for bat sign (guano). After visually inspecting the bridge, I monitored the bridge as the sun set and for one half-hour afterward for bats leaving the bridge to begin nighttime foraging.

The bridge design is such that it does not provide much suitable roosting or nursery habitat for bats. The exception is the expansion gap in the center of the bridge. Due to the inundation of the San Dieguito River, it was not possible to examine the expansion gap directly. There are many cliff swallow (*Petrochelidon pyrrhonota*) nests along the side of the bridge, and one black phoebe (*Sayornis nigricans semiatra*) nest is tucked in a corner under the bridge.

No bats were observed using the bridge, exiting the bridge to begin foraging, or flying with the flocks of swallows flying over the adjacent agricultural fields.

There is a low potential for bats to use this bridge in the future, due to the lack of suitable roosting or nursery areas. However, if the approved project includes impacts to the bridge, a pre-construction clearance survey may be warranted to ensure that bats and/or nesting birds are not impacted during construction.

If you have any questions regarding this letter, please do not hesitate to contact me at aclark@recon-us.com or 619-308-9333.

Sincerely,

Amy E. Clark

Amy E. Clark
Biologist

AEC:sh

Attachment D. Habitat Assessment for Quino Checkerspot Butterfly, 1999 and 2005

TIERRA
ENVIRONMENTAL SERVICES

June 18, 1999

Mr. Doug Krofta
U. S. Fish and Wildlife Service
2730 Loker Avenue West
Carlsbad, CA 92008

Subject: Habitat Assessment for the Quino Checkerspot Butterfly for the El Camino Road/Bridge Improvements Project

Dear Mr. Krofta:

Tierra Environmental Services performed a habitat assessment for the Quino Checkerspot butterfly along the project area for the El Camino Real Road and Bridge Improvements proposed by the City of San Diego. The study area is located along El Camino Real Road which extends north to south off of Via de la Valle in the City of San Diego, approximately 1.25 miles east of Interstate 5 (Figures 1 and 2).

El Camino Real Road currently consists of two lanes with no shoulder on either side. The proposed project involves two components. Phase I would include widening El Camino Real from Via de la Valle to San Dieguito Road, including improvements to the bridge crossing over the San Dieguito River. Phase II would involve widening the portion of El Camino Real that extends from San Dieguito Road south to Half Mile Drive. This assessment evaluated potential habitat along Phase I of the project. Only the northern portion of the proposed alignment was surveyed as the southern portion is either developed or in use as agricultural land. Although specific design details have yet to be determined, conceptual improvements to El Camino Real include the construction of two lanes in each direction, curbs, bike lanes, gutters, sidewalks, equestrian trails and crossings, landscaped medians and turn lanes, and traffic signals at intersections. The project also involves widening the existing river channel for a distance of approximately 1000 feet to the west and 850 feet to the east. Widening would entail excavation along the southern channel bank to accommodate anticipated future flood flows.

This survey consisted of a focused search for known checkerspot host plants including dot-seed plantain (*Plantago erecta*), owl's clover (*Castilleja exserta*), snapdragon (*Antirhinnum coulterianum*) and chinese houses (*Collinsia concolor*). No Quino checkerspot larvae, adults or host plants were observed along the project alignment.

9903-E Businesspark Ave., San Diego, CA 92131-1120
Phone: (619) 578-9064 ▲ Fax: (619) 578-3646

Methods

The survey of the study area was conducted by C. Nordby, A. Eng, and A. Pigniolo of Tierra Environmental Services on May 18, 1999 between the hours of 1330 and 1600 and May 25, 1999 between the hours of 0900 and 1130. The survey involved walking meandering transects within the proposed project area. The area surveyed encompasses approximately 13.5 acres, including an area 2,200 feet in length and 100 feet in width on either side of the existing roadway and 150 feet on either side of the bridge. On the south side of the existing bridge, an additional 160-foot wide, 850-foot long area to the east was surveyed. To the west, the survey was conducted within a 220-foot wide, 1000-foot long area. Weather at the time of the first survey was cool and clear with wind from the west at 5 to 10 mph and air temperature of approximately 67° F. At the time of the second survey, weather consisted of overcast skies with an air temperature of approximately 65°F.

Physical Setting

El Camino Real Road is located approximately 1.25 miles east of Interstate 5 and is accessible from the east and west from Via de la Valle and from the south from Del Mar Heights Road. Much of the project alignment follows the existing road, crossing the floodplain of the San Dieguito River. A narrow, disturbed drainage supporting some wetland species parallels the northern end of El Camino Real Road. The project area is otherwise generally flat with the exception of the channel banks of the river. On the south side of the river, the area surveyed to the west of El Camino Real includes a dirt road associated with adjacent agricultural uses as well as fragmented native vegetation (Figure 3). On the south side of the river to the east of El Camino Real, the area is ruderal in nature and has been subjected to previous vehicular disturbance (Figure 4).

The San Dieguito River channel east of the bridge is fortified with quarter ton rip rap while west of the bridge consists of a sandy, uneven substrate. Elevation along the alignment is approximately 20 feet above mean sea level (MSL) but drops between 5 to 10 feet from the existing roadbed to the San Dieguito River floodplain. Elevation at the San Dieguito River bottom is approximately 5 feet above MSL.

Soils within the area surveyed consist mostly of Tujunga sand, 0 to 5% slopes (TuB) which dominates the alluvial valley bottom. Grangeville fine sandy loam, 0 to 2% slopes (GoA) and Corralitos loamy sand, 5 to 9% slopes exist to the north and south in areas of higher elevation (Bowman et al. 1973).

Results

Vegetation communities are described in this report according to definitions provided in Holland (1986). Four vegetation communities were observed during the habitat assessment of the study area: southern willow scrub, southern coastal salt marsh, coastal brackish marsh and ruderal. A complete list of plant species observed in the project area is presented in Appendix A.

Southern willow scrub is described by Holland as a dense, broadleaved, winter-deciduous riparian thicket dominated by several willow (*Salix* sp.) species with scattered emergent Fremont's cottonwood (*Populus fremontii*) and western sycamore (*Platanus racemosa*). Fragments of southern willow scrub were observed within the project alignment along the southern bank of the San Dieguito River, both east and west of the bridge (Figure 3).

Southern coastal salt marsh is characterized by Holland as a highly productive community found in areas that receive regular tidal inundation. This community is comprised of salt-tolerant species that are typically active in the summer, dormant in the winter, and may grow to 3 feet (1 meter) in height. Characteristic species include saltgrass (*Distichlis spicata*), alkali heath (*Frankenia grandifolia*), jaumea (*Jaumea carnosa*), pickleweed (*Salicornia virginica*), glasswort (*Salicornia subterminalis*), saltwort (*Batis maritima*) and cordgrass (*Spartina foliosa*). A remnant strand of coastal salt marsh, approximately 800 feet long and between 10 and 40 feet wide, parallels the east side of El Camino Real north of the existing bridge. This area supports species such as pickleweed, saltgrass and curly dock (*Rumex crispus*). At the time of the survey, a portion of this community had been recently mowed (Figure 5). Patches of salt marsh also exist among ruderal species south of the San Dieguito River, both east and west of the bridge.

Coastal brackish marsh is characterized by species similar to those found in southern coastal salt marsh and is dominated by perennial, emergent monocots that grow up to 6 feet (2 meters) tall. Brackish marsh habitats support some species that occur in both salt marsh and freshwater marsh. Common species include sedges (*Carex* ssp.), saltgrass, rush (*Juncus* sp.), pickleweed (*Salicornia* sp.), bulrush and cattails (Holland 1986). Coastal brackish marsh within the project alignment occurs northeast of the bridge within a drainage that parallels El Camino Real Road. Species observed within this community include prairie bulrush (*Scirpus robustus*), curly dock, rabbit's-foot grass (*Polypogon monspeliensis*), saltgrass, brass buttons (*Cotula coronopifolia*) and Bermuda grass (*Cynodon dactylon*).

Ruderal describes habitat that has been subject to previous disturbance and is dominated by non-native, invasive species. Ruderal habitat describes much of the study area surveyed for Quino habitat (Figures 4-6). Dominant species in the ruderal habitat include mustard (*Brassica nigra*), wild oat (*Avena* sp.), garland (*Chrysanthemum coronarium*), wild radish (*Raphanus sativus*), salt cedar (*Tamarix* sp.) and tree tobacco (*Nicotiana glauca*). Other species observed include star thistle

(*Centaurea melitensis*), fennel (*Foeniculum vulgare*), bull thistle (*Cirsium* sp.), Bermuda grass (*Cynodon dactylon*) and long-beak filaree (*Erodium botrys*).

Due to the disturbed condition of most of the study area, few wildlife species were observed during the habitat assessment. A complete list of wildlife species observed during previous surveys of the project alignment is presented in Appendix B. No butterflies or larvae were detected during this survey of the project alignment.

Conclusion

This habitat assessment has determined that the study area would not be considered suitable habitat for the Quino checkerspot. The vegetation along the study area is primarily disturbed and supports none of the habitat conditions required by the Quino checkerspot. None of the known larval host plants were detected during the field survey. Furthermore, soils in the floodplain consist of alluvial sand, sandy loam or compacted loam rather than clayey substrate. Topographically, the site is generally flat in contrast with the diverse topography (hilltops, ridgelines or rock outcrops) often associated with preferred checkerspot habitat. Based on these observations, further focused surveys for the adult Quino checkerspot would be unnecessary.

Please do not hesitate to contact me if you have additional questions regarding this letter report. I can be reached at (619) 578-9064.

Sincerely,

Anita M. Eng

Anita Eng
Associate Biologist, PRT-840623

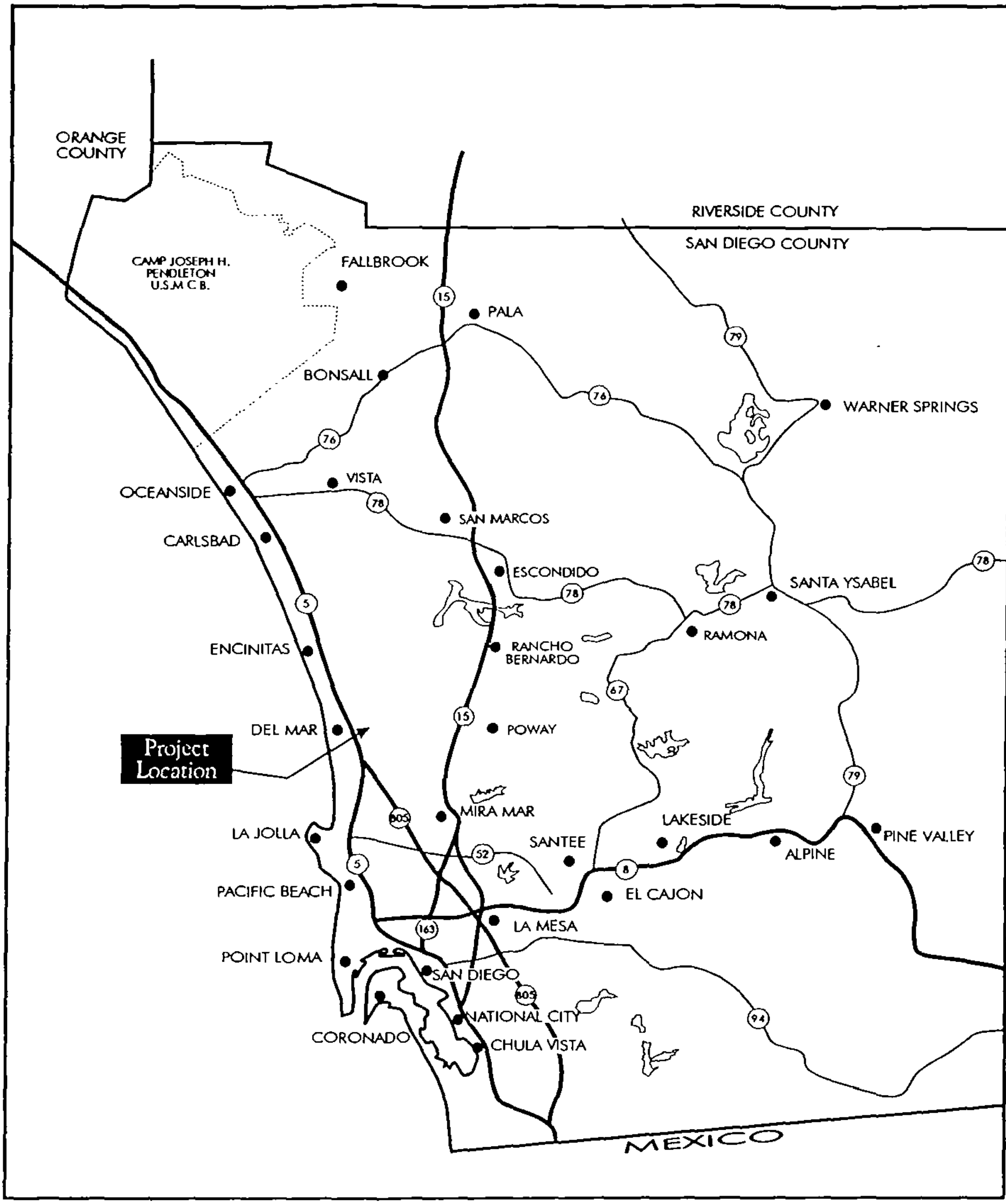


Figure 1
Regional Location Map

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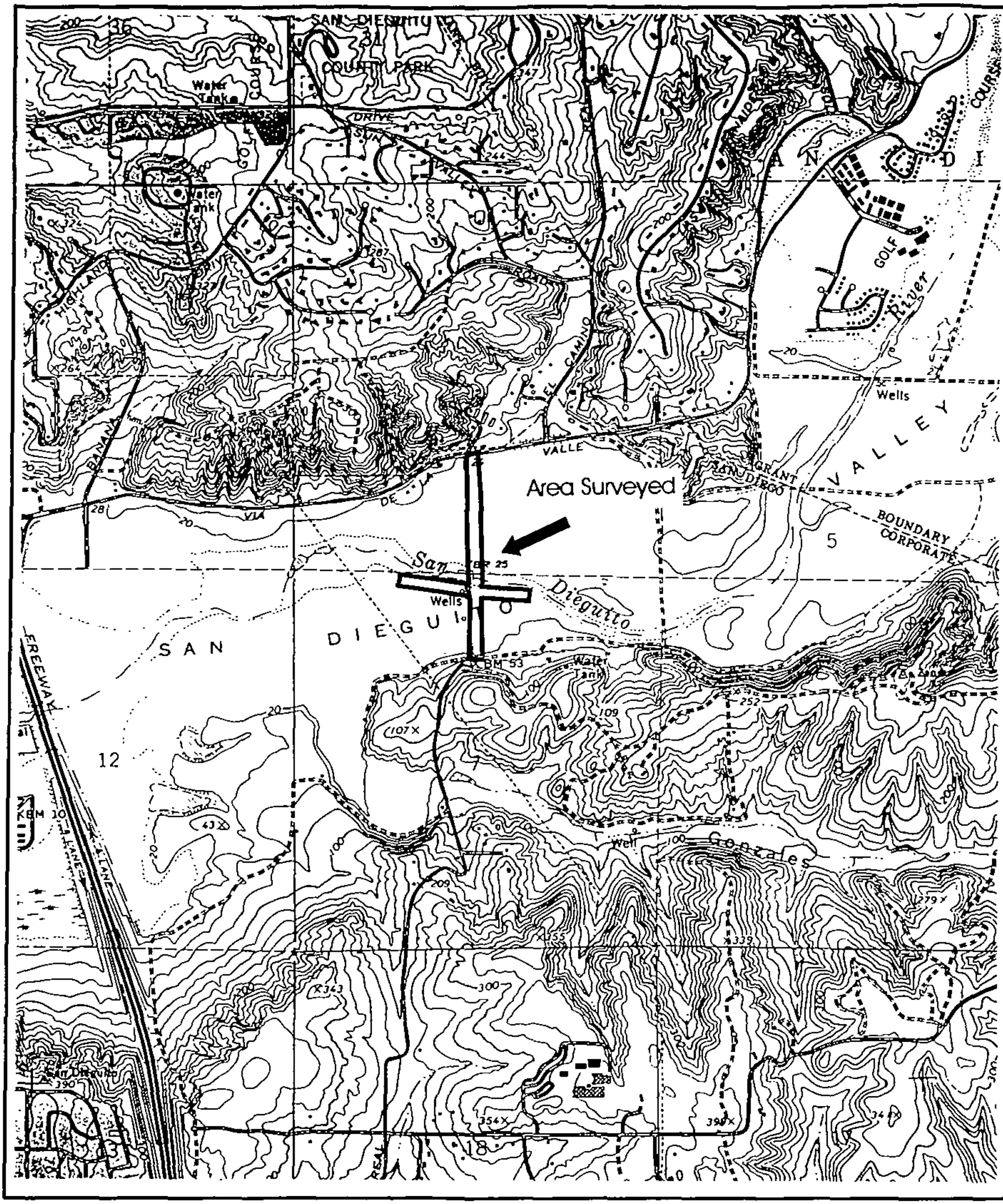

SOURCE: USGS 7.5' Quad Maps (Del Mar 1969 Edition Photorevised in 1975)

FIGURE 2
Project Location Map

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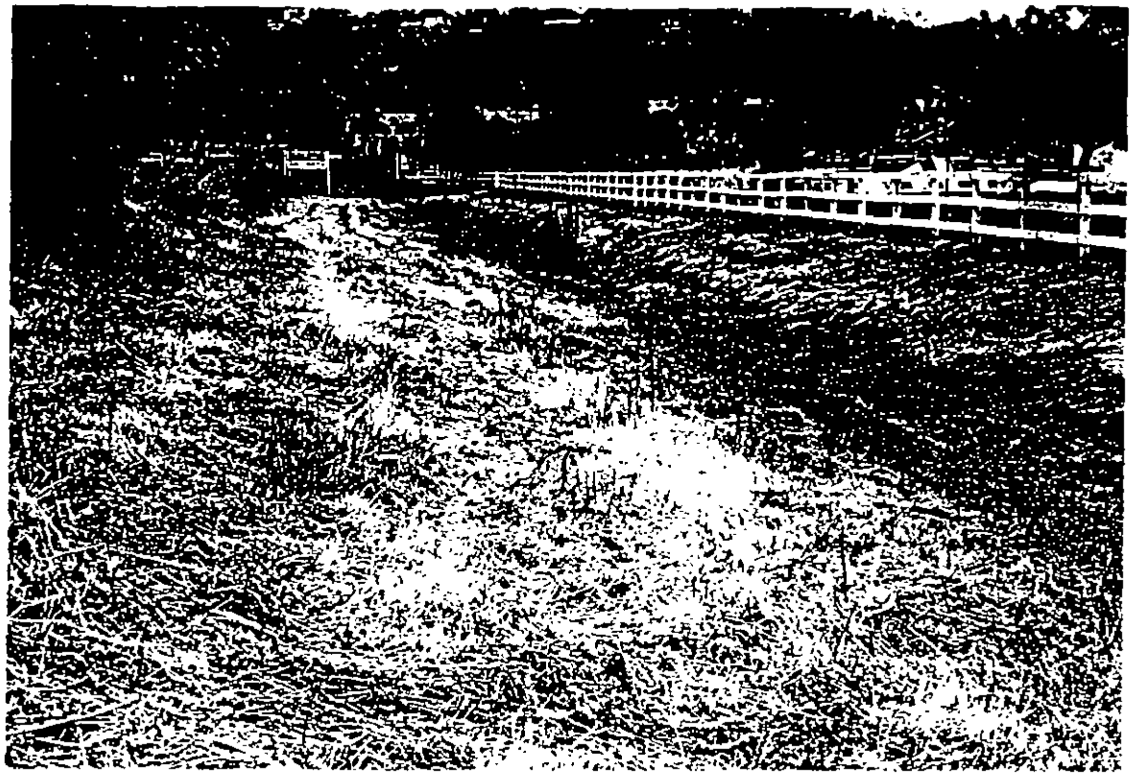
3.

4.

FIGURE 3. Photograph taken to the east. Fragmented southern willow scrub visible at the left side of the photo, north of the silt fencing.

FIGURE 4. Photograph of ruderal vegetation along the southern bank of the San Dieguito River. Taken to the west.

5.



6.

FIGURE 5. Photograph taken to the north illustrates recently mowed remnant salt marsh.

FIGURE 6. Photograph showing ruderal vegetation on the eastern side of El Camino Real, south of the San Dieguito River. Taken to the north from the southern end of the proposed project alignment.

Habitat Assessment for Quino Checkerspot Butterfly, El Camino Real Road/Bridge Widening Project

Prepared for:

Earthtech
9675 Businesspark Avenue
San Diego, CA 92131-1644

Prepared by:

Tierra Environmental Services
9915 Businesspark Avenue, Suite C
San Diego, CA 92131

May 16, 2006

1.0 Introduction

Tierra Environmental Services (Tierra) performed a habitat assessment for the Quino Checkerspot butterfly along the project area for the El Camino Real Road and Bridge Improvements proposed by the City of San Diego. The purpose of this habitat assessment was to confirm that conditions on-site were consistent with the 1999 habitat assessment conducted by Tierra. The study area is located along El Camino Real Road which extends north to south off of Via de la Valle in the City of San Diego, approximately 1.25 miles east of Interstate 5 (see 1999 habitat assessment).

This survey consisted of a focused search for known checkerspot host plants including dot-seed plantain (*Plantago erecta*), owl's clover (*Castilleja exserta*), snapdragon (*Antirhinnum coulterianum*) and Chinese houses (*Collinsia concolor*).

2.0 Methods

The survey of the study area was conducted by E. Alfaro (PRT-840623-1) and M. Alfaro (PRT-840623-1) of Tierra on January 12, 2005 between the hours of 1100 and 1130. The survey involved walking meandering transects within the proposed project area. The area surveyed encompasses approximately 13.5 acres, including an area 2,200 feet in length and 100 feet in width on either side of the existing roadways (El Camino Real Road and Via de la Valle) and 150 feet on either side of the bridge. Weather at the time of the survey was cool and clear with wind from the west at 5 to 10 mph and air temperature of approximately 63° F.

Larval host plants for this species are typically observed during spring months. However, due to abundant rain during 2005, dot-seed plantain was observed in December of 2004 in San Diego County (U.S. Fish and Wildlife Service 2005).

3.0 Physical Setting

El Camino Real Road is located approximately 1.25 miles east of Interstate 5 and is accessible from the east and west from Via de la Valle and from the south from Del Mar Heights Road. Much of the project alignment follows the existing road, crossing the floodplain of the San Dieguito River. A narrow, disturbed drainage supporting some wetland species parallels the northern end of El Camino Real Road. The project area is otherwise generally flat with the exception of the channel banks of the river. On the south side of the river, the area surveyed to the west of El Camino Real includes a dirt road associated with adjacent agricultural uses as well as fragmented native vegetation (Figure 3). A golf course exists on the south side of the river to the east of El Camino Real (Figure 4). Areas north of the river consists of a polo field, and a parking lot, and a horse stable. In addition, an area supporting disturbed marsh habitat occurs immediately south of Via de la Valle Road.

The San Dieguito River channel east of the bridge is fortified with quarter ton rip rap while west of the bridge consists of a sandy, uneven substrate. Elevation along the alignment is approximately 20 feet above mean sea level (MSL) but drops between 5 to 10 feet from the existing roadbed to the San Dieguito River floodplain. Elevation at the San Dieguito River bottom is approximately 5 feet above MSL.

Soils within the area surveyed consist mostly of Tujunga sand, 0 to 5% slopes (TuB) which dominates the alluvial valley bottom. Grangeville fine sandy loam, 0 to 2% slopes (GoA) and Corralitos loamy sand, 5 to 9% slopes exist to the north and south in areas of higher elevation (Bowman et al. 1973).

4.0 Results

Quino checkerspot butterfly larval host plants were not observed during the habitat assessment. The project area is surrounded by agricultural fields, a golf course, and equestrian facilities. Consequently, much of the survey area is disturbed. In addition, the area lacks topographic heterogeneity and clay soils.

5.0 Conclusion

This habitat assessment has confirmed that the study area would not be considered suitable habitat for the Quino checkerspot. The vegetation along the study area is primarily disturbed and supports none of the habitat conditions required by the Quino checkerspot. None of the known larval host plants were detected during the field survey. Furthermore, soils in the floodplain consist of alluvial sand, sandy loam or compacted loam rather than clayey substrate. Topographically, the site is generally flat in contrast with the diverse topography (hilltops, ridgelines or rock outcrops) often associated with preferred checkerspot habitat. Based on these observations, further focused surveys for the adult Quino checkerspot would be unnecessary.

6.0 Literature Cited

U.S. Fish and Wildlife Service. 2006. 2006 Season Quino Checkerspot Butterfly (*Euphydryas editha quino*) Monitored reference Site Information. World Wide Web. http://www.fws.gov/carlsbad/Rules/QuinoDocuments/Quino_htms/2005%20Quino%20monitoring%20info.htm

Attachment E. Protocol Survey Report for Arroyo Toad

FOCUSED SURVEYS FOR THE ARROYO SOUTHWESTERN TOAD CONDUCTED FOR THE EL CAMINO ROAD/BRIDGE WIDENING

Prepared for:

City of San Diego
Engineering and Capital Projects Department
1010 Second Avenue, Suite 1100
San Diego, CA 92101

Prepared by:

Tierra Environmental Services
9903-E Businesspark Avenue
San Diego, CA 92131

Chris Nordby, Principal Biologist

May 24, 1999

INTRODUCTION

The El Camino Real Bridge and Road widening project is located in the community of Del Mar, in northern San Diego County, California. El Camino Real extends north to south off of Via de la Valle in the City of San Diego and is located approximately 1.25 miles east of Interstate 5 (Figures 1 and 2). The existing road consists of a two lane highway with no shoulder on either side. The proposed project would be completed in two phases. Phase I would include construction in the segment of El Camino Real from Via de la Valle to San Dieguito Road, including improvements to the bridge crossing over the San Dieguito River. Phase II would involve the portion of El Camino Real that extends from San Dieguito Road south to Half Mile Drive. At the time of the toad surveys, specific design details had yet to be determined, however, conceptual improvements to El Camino Real include the construction of two lanes in each direction, curbs, bike lanes, gutters, sidewalks, equestrian trails and crossings, landscaped medians and turn lanes, and traffic signals at intersections.

The proposed project crosses the San Dieguito River which may provide habitat for the federally-endangered arroyo soutwestern toad. Due to the potential occurrence of the toad along the San Dieguito River and associated habitat, focused surveys were conducted during the 1998 breeding season. Because the project area was extended to the east and west on the south side of the river, additional surveys were conducted in 1999. This report documents the results of all focused surveys for arroyo toad conducted in the project area.

SPECIES ACCOUNT

The arroyo southwestern toad (*Bufo microscaphus californicus*) is a federally-endangered amphibian that inhabits riparian habitats of the southwestern United States. The arroyo toad is small (5-8 cm), light greenish-gray or tan with warty skin and dark spots. Its underside is buff-colored and often without spots.

The arroyo toad was historically found along the length of drainages between San Luis Obispo to San Diego County but has been extirpated from 75% of its former range (Federal Register 1994). It is currently restricted to small, isolated populations in various parts of southern California and Baja California. Factors contributing to the decline of the arroyo southwestern toad include dam construction, artificial flow regulation and off-road vehicle activities.

Optimal habitat for the arroyo southwestern toad consists of rivers that have shallow, gravelly pools adjacent to sandy terraces. Breeding for the arroyo southwestern toad takes place in large streams and occurs between late March and mid-June. Eggs are deposited and larvae develop in shallow pools with silty gravel/sand substrate that are relatively undisturbed by currents and have little emergent vegetation (Federal Register 1994). The toad requires shallow, slow-moving water for laying eggs. Sparsely vegetated sand or gravel terraces adjacent to streams having a closed canopy of cottonwoods or willows overhead are required for metamorphosing and foraging juveniles and adults. During the mating season, the adult males vocalize at night from mating

Figure 1
Regional Location Map

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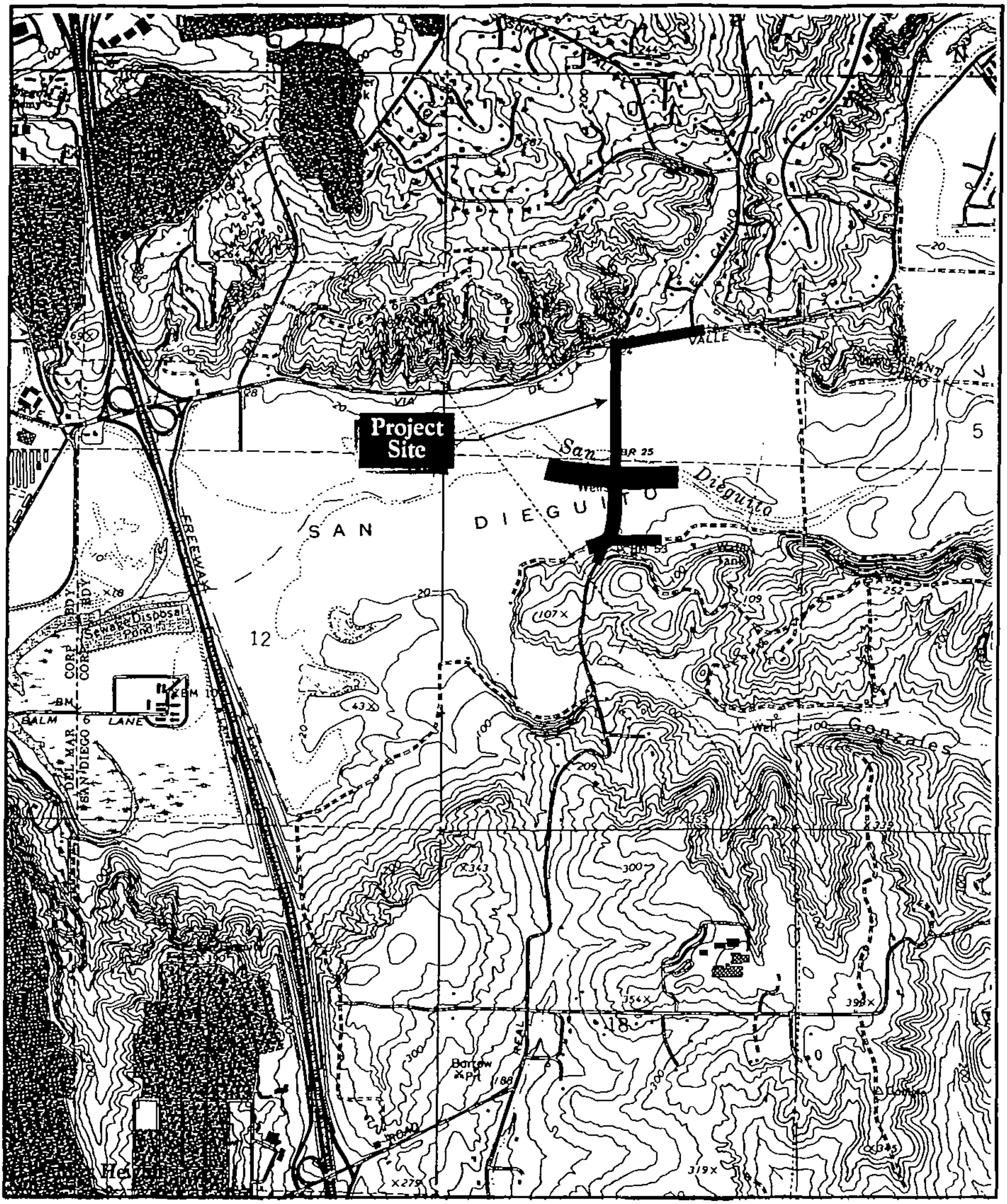

SOURCE: USGS 7.5' Quad Maps (Del Mar 1969 Edition Photorevised in 1975)

Figure 2
Project Location Map

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pools to attract females. The courtship vocalization is a distinctive high trill that lasts for 8 to 10 seconds. It is during mating season that surveys for vocalizing males can be conducted to determine presence or absence at a given site.

METHODS

A survey of the project area for the arroyo southwestern toad was conducted by Chris Nordby and Anita Eng of Tierra Environmental Services on May 15, 18, and 19, 1998 and on May 13, 17 and 18, 1999. The surveys consisted of a daylight evaluation to determine the suitability of riparian habitats for this species and three nighttime surveys to determine the presence of vocalizing male toads, if any. The initial daytime survey was conducted on May 15, 1998 between the hours of 1330 and 1530. The daytime survey of the extended project area was conducted on May 13, between the hours of 1330 and 1600. Surveyors walked along the river bank approximately 300 feet from the proposed project right-of-way, evaluated the vegetation on-site and looked for arroyo toad adults, larvae and eggs. The nighttime surveys were conducted between the hours of 2030 and 2200 according to U.S. Fish and Wildlife-approved protocol which are summarized below:

- All suitable habitat must be surveyed for calling adult toads a minimum of three times during the breeding season.

- Surveys must be conducted between March 15 and May 30 at sites between sea level and 1,500 ft.

- Surveys must be conducted between 1 hour after dusk and midnight.

- Avoid surveying on nights with a full moon, when air temperatures are below 55° F or after rain, high winds or flood events.

- Surveyors should avoid potential impacts to adult toads by staying well back from stream banks.

- Arroyo toads may not be handled without a USFWS permit.

Surveys involved walking on the river banks, at least ten feet from the water's edge, and listening for arroyo toad vocalizations. A flashlight was also used to detect eyeshine in the upland areas.

Weather conditions during the survey on May 15, 1998 consisted of an air temperature of approximately 65°F. There was no wind at the time of the survey and the moon was two days prior to the last quarter moon stage. Weather conditions during the May 18, 1998 survey consisted of an air temperature of approximately 65° and no wind. The air temperature during the May 19, 1998 survey was approximately 65°F with no wind. The moon was one day prior to last quarter moon stage on the May 19 survey.

Weather conditions during the May 13, 1999 survey consisted of air temperature of approximately 59° F, clear skies and no moon. On May 17, 1999, weather conditions during the survey consisted of clear skies, air temperature of 60° F and no moon. On May 18, 1999 survey conditions consisted of air temperature of 57° F, clear skies and a partial crescent moon.

RESULTS

Suitable habitat for arroyo toads may include one or all of three distinct zones along the stream which may support adult toads, eggs or larvae. These include the lower stream terrace, the marginal zone and the upper stream terrace (J. Copp, personal communication, 1995). The lower stream terrace is defined as that area immediately adjacent to and including the running water of the San Dieguito River. Optimal lower terrace habitat for arroyo toads includes shallow, slowly-moving water with occasional pools, no emergent vegetation, with sand or pea gravel substrate overlain with flocculent silt (Federal Register 1994). The marginal zone consists of the transitional area, or bank, between the lower terrace and the upper terrace. Optimal marginal zone habitat consists of a gradually sloping bank vegetated with scattered mule fat (*Baccharis salicifolia*) and willows (*Salix* spp.). The upper terrace includes areas of the higher floodplain adjacent that are composed of a sand/gravel substrate with scattered willows, oaks (*Quercus* sp.) and mule fat.

1998 Habitat Evaluation. The site of the El Camino Road/Bridge widening would not be considered suitable arroyo toad habitat. Water levels in the San Dieguito River are too high to serve as lower stream terrace habitat. Potential lower terrace habitat for the toad does exist on the west side of the river, however it was completely flooded at the time of the survey, precluding any use as breeding pools. The river banks east of the existing bridge consist of rip rap channel walls. Upland areas that would provide upper terrace habitat are vegetated with ruderal vegetation and consist primarily of weedy species. These include garland (*Chrysanthemum coronarium*), wild radish (*Raphanus sativus*), salt cedar (*Tamarix* sp.) and tree tobacco (*Nicotiana glauca*). Other species observed include mustard (*Brassica* sp.), wild oat (*Avena* sp.), star thistle (*Centaurea melitensis*), fennel (*Foeniculum vulgare*), bull thistle (*Cirsium* sp.), Bermuda grass and long-beak filaree (*Erodium botrys*).

An island of salt marsh or coastal brackish marsh exists in the middle of the river east of the bridge. However, salt marsh vegetation is not considered suitable arroyo toad habitat.

1998 Survey Results. No arroyo southwestern toads were detected during the three focused surveys conducted at the El Camino Road/Bridge project site. During the first nighttime survey, two Pacific chorus frogs (*Pseudacris regilla*) were heard vocalizing. Up to six chorus frogs were heard during subsequent surveys.

1999 Habitat Evaluation. The extended project area on the south side of the El Camino Bridge follows the San Dieguito River for approximately 750 ft to the east and 1000 ft to the west. Due to the dominance of non-native species and the disturbed condition of adjacent property, the habitat on the southern channel bank would not be expected to provide foraging habitat for the arroyo toad.

In addition to relatively deep water in the river channel and the lack of shallow pools for breeding habitat, dense cattails and willow vegetation directly adjacent to the channel itself. These would preclude access from breeding areas to adjacent marginal and upper terrace habitat. Marginal habitat would be considered of low quality. Although gently sloping sandy banks are available, vegetation in this area consists primarily of remnant willow scrub including mulefat (*Baccharis salicifolia*) and Goodding's black willow (*Salix gooddingii*) and a large proportion of opportunistic, invasive species. These include as cocklebur (*Ricinus communis*), salt cedar (*Tamarix* sp.), common sow thistle (*Sonchus oleraceus*), mustard (*Brassica* sp.), sweet clover (*Melilotus indicus*) and wild radish (*Raphanus sativus*). Remnant coastal salt marsh dominated by pickleweed (*Salicornia virginica*) also occurs along the southern banks of the San Dieguito River.

Upland vegetation consists of ruderal and agricultural land. These areas would not be considered suitable upper terrace habitat for the arroyo toad. Ruderal habitat in these areas is dominated by rip-gut brome (*Bromus diandrus*), and mustard with wild oat and goldenbush (*Isocoma menziesii*) lesser dominants. Agricultural areas are devoid of native vegetation.

1999 Survey Results. No arroyo toads were detected during focused surveys. However, several crayfish were observed on the east side of the bridge. Numerous Pacific chorus frogs and one bullfrog (*Bufo boreas*) were also detected aurally. In addition, salinity measurements were taken on both sides of the bridge. These measurements indicated that salinity in the vicinity of the bridge at the time of the survey was approximately 8 parts per thousand. These conditions would be considered excessively saline and unsuitable habitat for the arroyo toad.

CONCLUSION

Due to the absence of suitable lower stream terrace, marginal and upper terrace habitat, it is unlikely that the arroyo toad exists in the vicinity of the El Camino Road and Bridge Widening Project. Excessively saline conditions and the presence of potential predators such as crayfish and bullfrog also indicate that this portion of the San Dieguito River does not support arroyo toad. Human disturbance from surrounding areas in the form of traffic noise and lights would further discourage the use of this area by arroyo toads.

Attachment F. 2001 Survey Report for Light-Footed Clapper Rail

Konecny Biological Services
Biological Assessment, Monitoring, Research

May 7, 2001
01-3-A

AMEC Earth and Environmental, Inc.
5510 Morehouse Drive
San Diego, CA 92121

Attn: Mr. Stephen Lacy

Re: Results of a Year 2001 Focused Survey for the Light-footed Clapper Rail at the Proposed Caltrans Northbound Interstate 5 Auxiliary Lane Expansion Site between Del Mar Heights Road and Via de le Valle, San Diego, California.

Dear Mr. Lacy:

This letter report presents the results of focused surveys for the light-footed clapper rail (*Rallus longirostris levipes*), at the proposed Caltrans Northbound Interstate 5 auxiliary lane expansion site between Del Mar heights Road and Via de la Valle, San Diego, California. The light-footed clapper rail is listed as an endangered species by the United States Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG).

Surveys for the light-footed clapper rail were conducted following protocol approved by the USFWS for the Yuma clapper rail (*R. l. yumanensis*) dated January 2000, with modifications made to conform with the methodology of Zembal (2000). The surveys were conducted by wildlife biologist John Konecny, with the assistance of AMEC biologist David Bise, and Caltrans biologist Robert James. This activity is authorized by USFWS section 10(a) permit number TE837308-2.

INTRODUCTION

The light-footed clapper rail is a slender, tawny-breasted bird with grayish edges on brown centered back feathers, olive wing coverts, vertical white bars on the flanks, a white stripe over the eye, and a partially orange bill. The light-footed clapper rail occurred historically along the coast of southern California from Carpinteria Marsh in Santa Barbara County south to San Quintin, Baja California, Mexico (USFWS 1994).

Populations of light-footed clapper rails have undergone decline in the United States due to the rail's limited distribution, and destruction and degradation of coastal salt marsh habitat. The largest number of light-footed clapper pairs in recent history was reported to be 325 pairs in 15 marshes in 1996. The population in the year 2000 was reported to be 253 pairs (Zembal 2000). 90% of these are found in just three wetland areas, Anaheim Bay, Newport Bay, and the Tijuana Estuary.

The primary habitat of light-footed clapper rails is coastal salt marsh characterized by cordgrass (*Spartina foliosa*). Other habitats including pickleweed (*Salicornia* sp.) and

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Tel (760) 489-5276 E-mail puffinus@msn.com

other adjacent habitats are used to some extent. (USFWS 1994). Light-footed clapper rails have also nested in freshwater marsh at Buena Vista Lagoon, San Diego County (Zemball 2000).

PROJECT LOCATION

The proposed auxiliary lane expansion site is located immediately east of the Interstate 5 northbound lane, between Del Mar Heights Road and Via de la Valle. The project site is bordered by the San Dieguito River on the north, El Camino Real on the east, Interstate 5 on the west, and the community of Del Mar Heights on the south side (Figure 1.). Specifically, the referenced site is located within Township 14 South, Range 4 West, in Sections one and 12 of the United States Geological Survey (USGS) Del Mar 7.5 minute quadrangle.

PROJECT SITE DESCRIPTION

Much of the San Dieguito River valley east of Interstate 5 and south of the San Dieguito River is active agricultural. Very little natural habitat is present around these fields.

The San Dieguito River flows perennially along the northern edge of the project site. Its banks are characterized by primarily monotypic pickleweed, east of the Interstate 5 Bridge. This habitat transitions into open water habitat and then into freshwater marsh farther upstream to the east. The freshwater marsh at the El Camino Real Bridge is relatively lush and characterized by cattails (*Typha* sp.), with smaller clumps of bulrush (*Scirpus* sp.).

Farther to the south, a storm water drain on the west side of El Camino Real drains the housing community to the east. Water from the drain flows west, creating a wetland at its base with standing water. Willow riparian woodland, characterized by arroyo willow (*Salix lasiolepis*), and mulefat (*Baccharis salicifolia*) is present in the reach between the drain and open water area. Freshwater marsh characterized by cattail and bulrush, with some intermittent pickleweed is present around the east and south sides of the open water area.

Elevation of the site ranges from 0 Mean Sea Level (MSL) to 26 feet above MSL. Photographs of the site are included as attachment 1.

METHODS

A habitat assessment of the area was conducted on March 12, 2001. The San Dieguito River was walked from the Interstate 5 Bridge to the El Camino Real Bridge, and the entire periphery of the southern fresh water marsh/open water area was examined for appropriate light-footed clapper rail habitat. Eight survey stations were established in the project area, four on the San Dieguito River, and four around the storm water basin. The locations of the eight survey stations are depicted in Figure 2.

At this time, a survey protocol for the light-footed clapper rail does not exist. Under the instructions of the Carlsbad Field Office, the survey protocol for the Yuma clapper rail (USFWS 2000) was substituted. The protocol was modified by shortening the survey window by approximately one month, so the survey would end by mid-April, conforming to the survey window used by Zemball (2000). A third survey event was added. The third survey event was a dusk survey.

Three focused surveys for the light-footed clapper rail were conducted at least one week apart. Two dawn surveys were conducted on March 15 and April 1, and were initiated approximately 30 minutes prior to sunrise (0600) and continued until 0800. One dusk survey was conducted on March 23, 2001. The dusk survey was begun approximately two hours prior to sunset (1700), and continued until 1830. The surveys were conducted by stopping at each of the eight survey stations and listening for rails for one-minute. If rails were not detected, a tape-recorded vocalization of the light-footed clapper rail was played for two-minutes. A response was listened for during the next two-minute interval. If rails were not detected, the tape was played for a second two-minute interval, and one minute was waited before proceeding to the next station.

RESULTS

A single advertising male light-footed clapper was detected on each of the three surveys at station 5, immediately west of the El Camino Real bridge, on the San Dieguito River (Figure 3). On all three occurrences, this individual gave the characteristic "kek" call of a single unmated male. No other light-footed clapper rails were detected at the other seven stations.

Unpaired light-footed clapper rails have been detected east of Interstate 5 in approximately six of the last twenty years of surveying (R. Zembal, pers.com.). It is possible that other light-footed clapper rails exist upstream of the El Camino Real Bridge. It is likely that this small population floats between the San Dieguito River and the storm water drain area, and is the remnant of a once larger population that occupied the intertidal salt marsh habitat of San Dieguito Lagoon and the river valley.

A total of 44 species of birds were detected while conducting focused surveys for the light-footed clapper rail at the Caltrans Interstate 5 auxiliary lane expansion site (Table 1). No other Federal or State listed species were detected. The double-crested cormorant (*Phalacrocorax auritus*), white-faced ibis (*Plegadis chihi*), California gull (*Larus californicus*), were detected onsite. These three species are considered sensitive by CDFG.

The results of focused surveys for listed species are typically considered valid for one year by the USFWS and CDFG. If you have any questions or require additional information, please call me at (760) 489-5276.

Sincerely,

John K. Konecny

John K. Konecny
Wildlife Biologist
TE837308-2

REFERENCES CITED

California Department of Fish and Game. 2000. State and Federally Listed Endangered and Threatened Animals of California. State of California. The Resources Agency. Department of Fish and Game. Natural Heritage Division. Natural Diversity Data Base. 12pp.

United States Fish and Wildlife Service. 2000. Yuma Clapper Rail Survey Protocol. Yuma Clapper Rail Recovery Team. January 2000. Two pages.

United States Fish and Wildlife Service. 1994. Light-footed Clapper Rail. Unpublished one page pamphlet, Richard Zembal - author.

Zembal R. and S. M. Hoffman. 2000. Light-footed Clapper Rail Management, Study, and Translocation Project, 2000. Report to Naval Air Station Point Mugu, U.S. Fish and Wildlife Service, and California Department of Fish and Game, for California State University, Long Beach Foundation. 17pp.

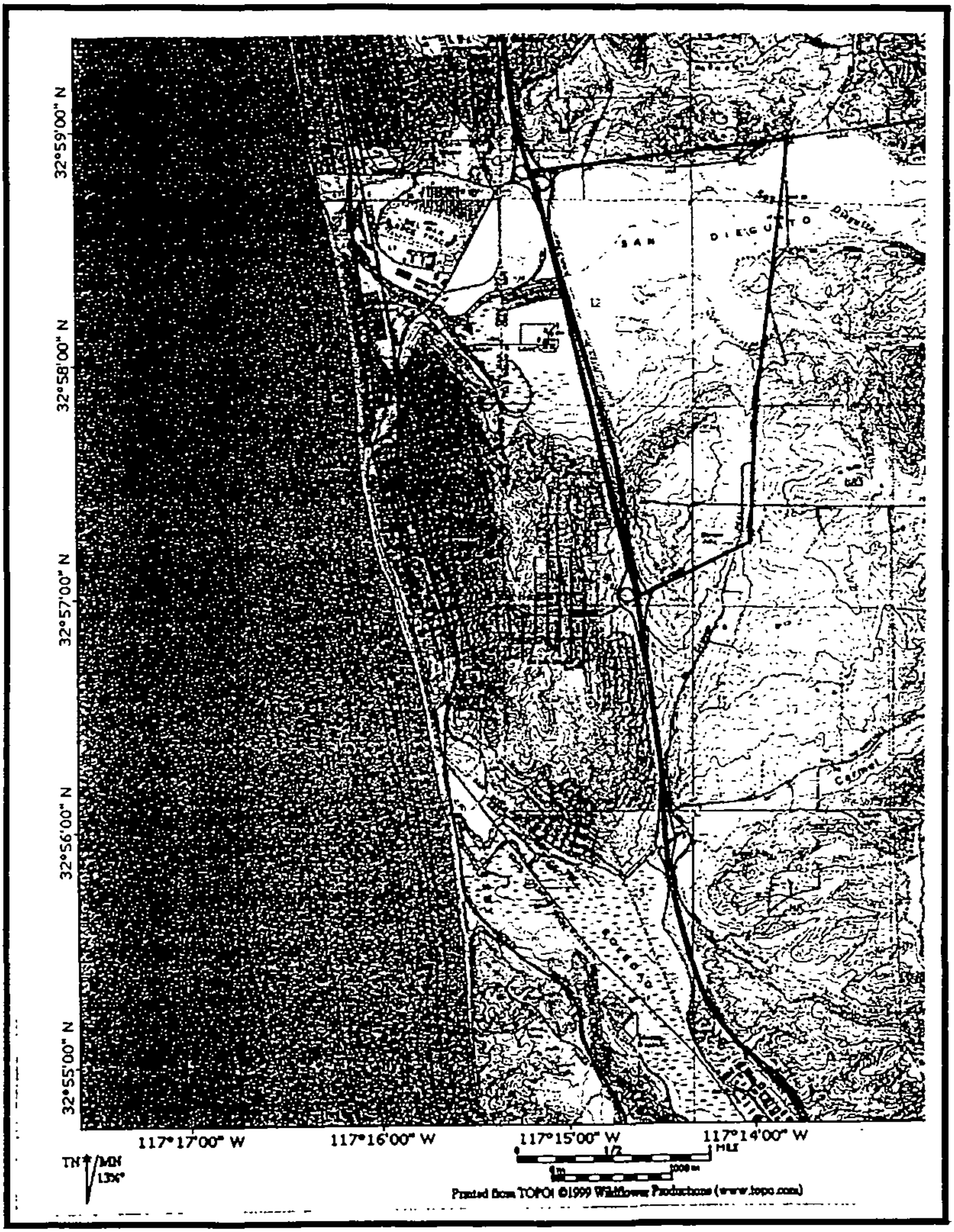


Figure 1. Location of the Caltrans Northbound Interstate 5 Auxiliary Lane Expansion Site, San Diego County, California.

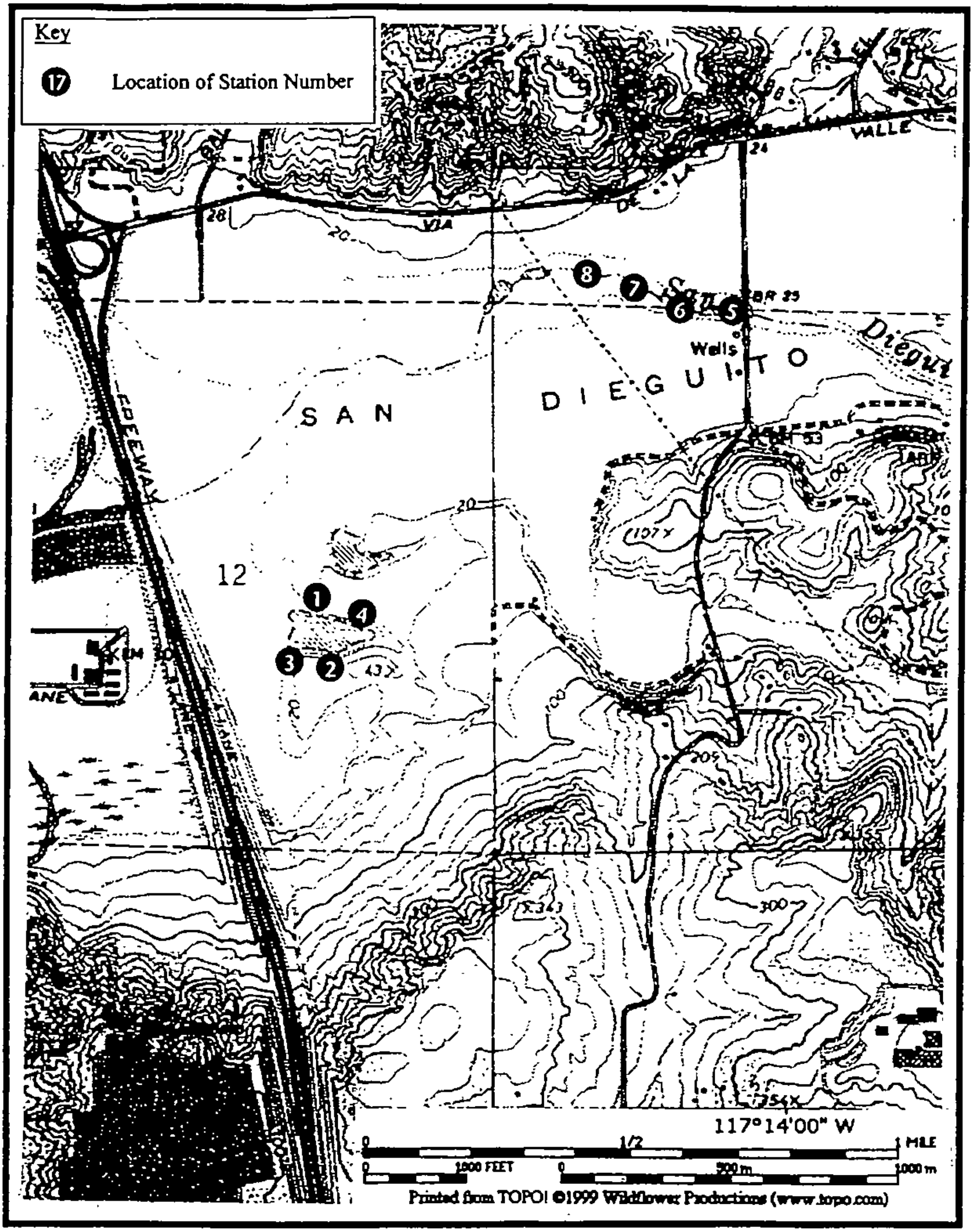


Figure 2. Location of Eight Light-footed Clapper Rail Survey Stations at the Caltrans Northbound Interstate 5 Auxiliary Lane Expansion Site, San Diego County, California.

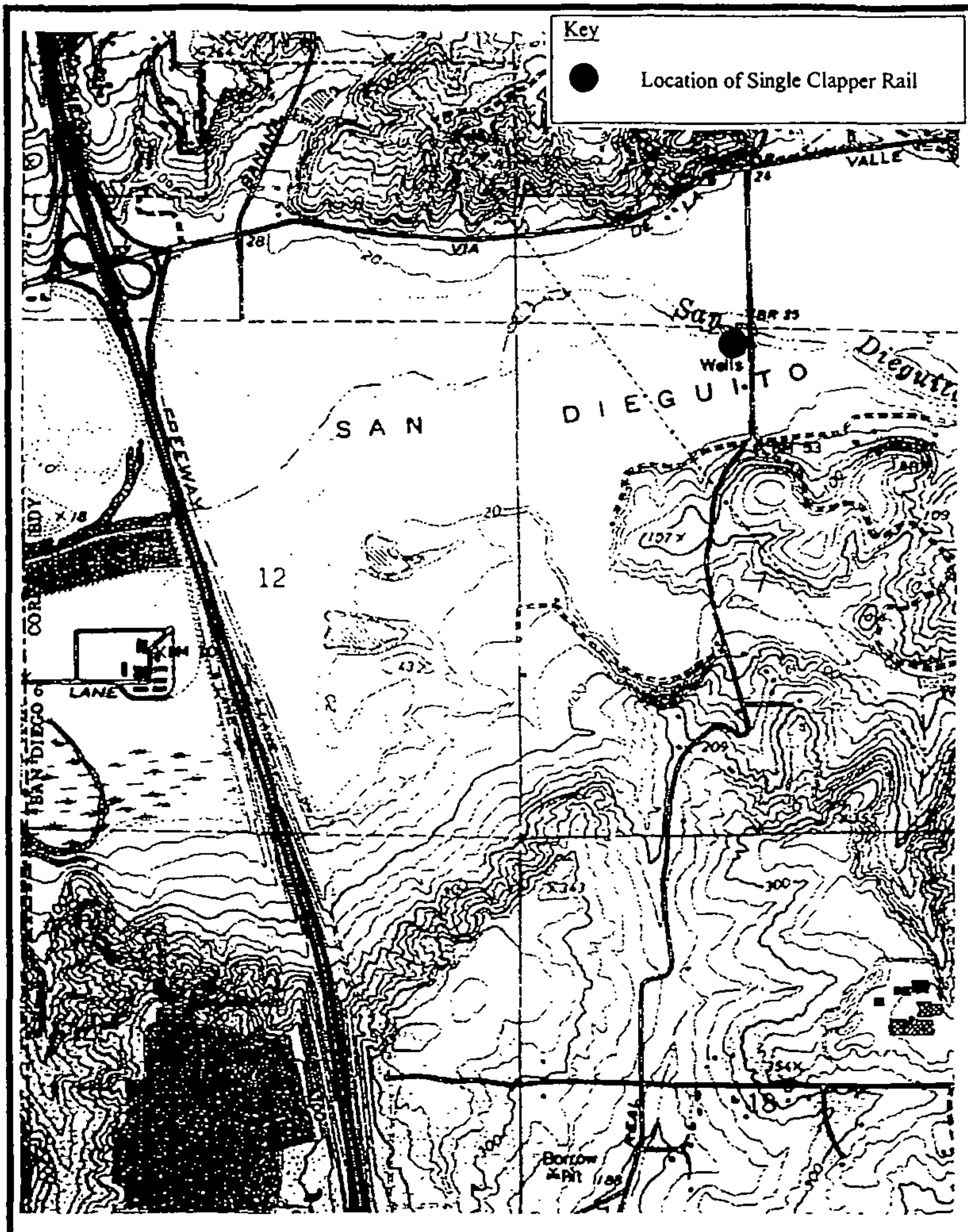


Figure 3. Location of the Light-footed Clapper Rail Detected at the Caltrans Northbound Interstate 5 Auxiliary Lane Expansion Site, San Diego County, California.

Table 1. Bird Species Detected at the Del Mar-San Dieguito Site During Three Year 2001 Focused Light-footed Clapper Rail Surveys.

Class Aves	
Family Podicipeda	
Pied-billed Grebe	*Podilymbus podiceps*
Family Phalacrocoracidae	
Double-crested Cormorant	*Phalacrocorax auritus*
Family Ardeidae	
Great Blue Heron	*Ardea herodias*
Family Threskiornithidae	
White-faced Ibis	*Plegadis chihi*
Family Anatidae	
Mallard	*Anas platyrhynchos*
Redhead	*Aythya americana*
Bufflehead	*Bucephala albeola*
American Wigeon	*Anas americana*
Eurasion Wigeon	*Anas penelope*
Northern Shoveler	*Anas clypeata*
Gadwall	*Anas strepera*
Ruddy Duck	*Oxyura jamaicensis*
Family Rallidae	
American Coot	*Fulica Americana*
Clapper Rail (light-footed)	*Rallus longirostris levipes*
Family Charadridae	
Killdeer	*Charadrius vociferous*
Family Recurvirostridae	
Black-necked Stilt	*Himantopus mexicanus*
Family Laridae	
Ring-billed Gull	*Larus delawarensis*
California Gull	*Larus californicus*
Family Columbidae	
Mourning Dove	*Zenaida macroura*

Family Trochilidae	
Anna's Hummingbird	*Calypte anna*
Family Alcedidae	
Belted Kingfisher	*Ceryle alcyon*
Family Picidae	
Downey Woodpecker	*Picoides pubescens*
Nuttall's Woodpecker	*Picoides nuttallii*
Family Tyrannidae	
Black Phoebe	*Sayornis nigricans*
Family Hirundinidae	
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Cliff Swallow	*Petrochelidon pyrrhonota*
Family Aegithalidae	
Common Bushtit	*Psaltriparus minimus*
Family Troglodytidae	
Marsh Wren	*Cistothorus palustris*
Family Mimidae	
Northern Mockingbird	*Mimus polyglottus*
Family Parulidae	
Yellow-rumped Warbler	*Dendroica coronata*
Common Yellowthroat	*Geothlypis trichas*
Yellow Warbler	*Dendroica petechia*
Orange-crowned Warbler	*Vermivora celata*
Wilson's Warbler	*Wilsonia pusilla*
Family Emberizidae	
Spotted Towhee	*Pipilo erythrophthalmus*
California Towhee	*Pipilo fuscus*
Savannah sparrow	*Passerculus sandwichensis*
Song Sparrow	*Melospiza melodia*
White-crowned Sparrow	*Zonotrichia leucophrys*
Family Icteridae	
Red-winged Blackbird	*Agelaius phoeniceus*
Brewer's Blackbird	*Euphagus cyanocephalus*
Brown-headed Cowbird	*Molothrus ater*

Family Fringillidae

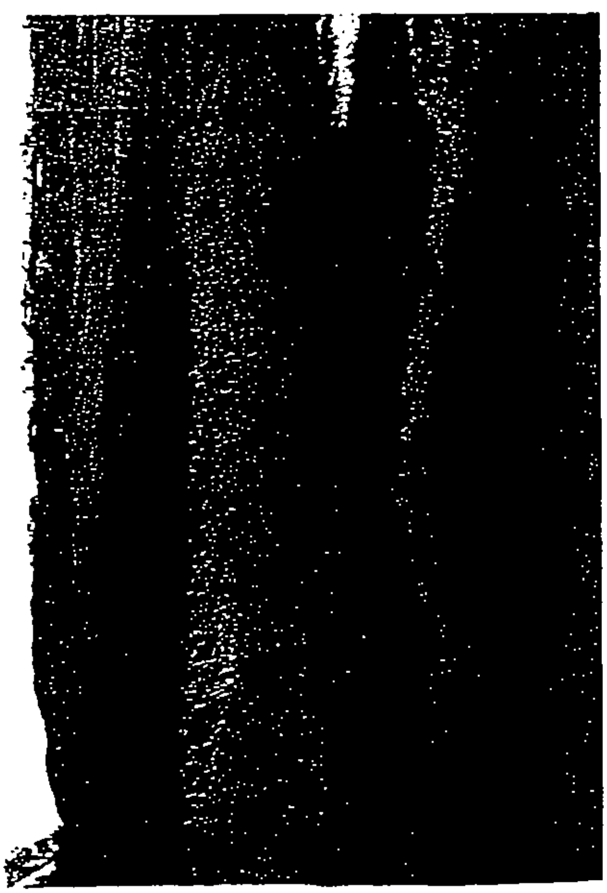
Lesser Goldfinch	*Carduelis psaltria*
House Finch	*Carpodactus mexicanus*

Attachment 1. Photos of Site

Attachment 1. Photos of Site, Storm Water Basin Stations

Station 2.

Station 4.



Station 1.

Station 3.

Attachment 1. Photos of Site, San Dieguito River Stations

Station 6.

Station 8.

Station 5.

Station 7.

Attachment 2. Data Sheets

YUMA CLAPPER RAIL SURVEY
COVER SHEET
(JANUARY 2000)

Date: 15 March, 2001

Location Information:
Location Name San Dieguito Route ______

Map Name Del Mar Township/Range/Section T14 south, R 4 west, S 1 + 12

Observer(s) John Konecny, Dave Bise

Weather:
Start %Cloud Cover 100 Temp 55°F Wind Speed 3-5 mph
End % Cloud Cover 100 Temp 60°F Wind Speed 3-5 mph

Data Summary:

1) Total individual rails seen or heard while surveying 1
2) Number of other rails seen or heard (incidentals) Ø

Total rails per route or location equals #1+#2 1
For rails/hour, each stop is 7 minutes

Observations:

Events during survey that may have affected results:

Other Observations/Comments:

uma Clapper Rail Survey Data Sheet January 2000

ocation San Dieguito Route ______ Date 15 March 2001

eather-start 100% overcast, wind 3-5 temp: 55°F end 100% overcast, wind 3-5 temp: 60°F Observer John Konecny, Dave Bise

top	Time Start	Time Stop	Clatter Call	Kek Call	Other Call	Was Rail Seen?	Was Rail Heard?	Was Rail Paired?	Other Species?	Habitat Type Where Rail Was Detected
1	0542	0550				no	no	n/a		
2	0555	0603				no	no	n/a		
3	06006	0614				no	no	n/a		
4	0632	0640				no	no	n/a		
5	0658	0706		X		no	yes	no		typha 1°, scirpus 2°
6	0708	0716				no	no	n/a		
7	0718	0726				no	no	n/a		
8	0728	0736				no	no	n/a		

ge total:

Total rails recorded on survey 1

Incidental observations of rails in survey area Ø

YUMA CLAPPER RAIL SURVEY
COVER SHEET
(JANUARY 2000)

Date: 23 March, 2001

Location Information:
Location Name San Diegsuito Route

Map Name Del Mar Township/Range/Section T 14 south, R 4 west, S 12+13

Observer(s) JOHN KONECNY

Weather:
Start %Cloud Cover 60 Temp 65°F Wind Speed 5-10 mph
End % Cloud Cover 60 Temp 62°F Wind Speed 3-5 mph

Data Summary:

1) Total individual rails seen or heard while surveying 1
2) Number of other rails seen or heard (incidentals) Ø

Total rails per route or location equals #1+#2 1
For rails/hour, each stop is 7 minutes

Observations:

Events during survey that may have affected results:

Other Observations/Comments:

'uma Clapper Rail Survey Data Sheet January 2000

ocation San Dieguito Route ______ Date 23 March, 2001

Veather-start 60% overcast, wind 5-10 temp: 65°F end 60% overcast, wind 3-5 dark, temp: 62°F Observer John Konecny, Dave Bire

Stop #	Time Start	Time Stop	Clatter Call	Kek Call	Other Call	Was Rail Seen?	Was Rail Heard?	Was Rail Paired?	Other Species?	Habitat Type Where Rail Was Detected
8	1657	1705				no	no	n/a		
7	1708	1716				no	no	n/a		
6	1718	1726				no	no	n/a		
5	1729	1737		X		no	yes	no		1° typha, 2° scirpus
2	1755	1803				no	no	n/a		
3	1806	1814				no	no	n/a		
4	1829	1837				no	no	n/a		
1	1819	1827				no	no	n/a		

Page total:

Total rails recorded on survey 1

Incidental observations of rails in survey area Ø

YUMA CLAPPER RAIL SURVEY
COVER SHEET
(JANUARY 2000)

Date: 1 April 2001

Location Information:
Location Name San Dieguito Route

Map Name Del Mar Township/Range/Section T 14 South, R 4 West, S 12+13

Observer(s) John Konecny, Bob Jones

Weather:
Start %Cloud Cover 100 Temp 62°F Wind Speed 3-5 mph
End % Cloud Cover 100 Temp 65°F Wind Speed 3-5 mph

Data Summary:

1) Total individual rails seen or heard while surveying 1
2) Number of other rails seen or heard (incidentals) 0

Total rails per route or location equals #1+#2 1
For rails/hour, each stop is 7 minutes

Observations:

Events during survey that may have affected results:

Other Observations/Comments:

'uma Clapper Rail Survey Data Sheet

January 2000

ocation San Diegsuito Route Date 1 April, 2001

/eather-start 100% overcast, wind 3-5 temp: 62°F end 100% overcast, wind 3-5 temp: 65°F Observer John Konecny, Bob Jones

Stop #	Time Start	Time Stop	Clatter Call	Kek Call	Other Call	Was Rail Seen?	Was Rail Heard?	Was Rail Paired?	Other Species?	Habitat Type Where Rail Was Detected
1	0706	0714				no	no	n/a		
4	0717	0725				no	no	n/a		
2	0750	0758				no	no	n/a		
3	0801	0809				no	no	n/a		
5	0832	0840		X		no	yes	no		1° typha, 2° scirpus
6	0846	0854				no	no	n/a		
7	0857	0905				no	no	n/a		
8	0908	0916				no	no	n/a		

Page total:

Total rails recorded on survey 1

Incidental observations of rails in survey area Ø

Attachment G. Focused Survey Report for Least Bell's Vireo

TIERRA
ENVIRONMENTAL SERVICES

August 11, 2003

Katherine Hon
Hon Consulting, Inc.
2226 Dwight Street
San Diego, California 92104

Re: Least Bell's Vireo Focused Surveys for the El Camino Real Road and Bridge Widening Project.

Dear Ms. Hon,

At your request, Tierra Environmental Services (Tierra) conducted presence/absence surveys for the federally and state endangered least Bell's vireo (*Vireo bellii pusillus*) in the proposed El Camino Real Road/Bridge Widening Project area. The proposed project site is situated in northwest San Diego County (Figure 1). El Camino Real Road (El Camino Real) extends north to south off of Via de la Valle and is located approximately 1.25 miles east of Interstate 5 (Figure 2). The proposed project involves the widening of El Camino Real, raising of the existing bridge, and widening of the existing San Dieguito River channel.

Eight surveys were conducted by M. Alfaro and E. Alfaro on April 19; May 5, 15; June 20; July 1, 9, 20, and 30. Surveys were conducted according to USFWS-approved protocol. Table 1 summarizes dates, times, and weather conditions of each survey.

The study area consisted of a section of the San Dieguito River approximately 0.38 mile (mi) in length. This area supports native and exotic plant species. Vegetation communities observed in the study area included disturbed Diegan coastal sage scrub, disturbed mulefat scrub, disturbed southern willow scrub, and disturbed coastal brackish marsh. The condition of the study area can be described as intermittent disturbed patches of willow (*Salix* spp.) occurring in disturbed coastal brackish marsh.

Southern willow scrub, the preferred habitat of the least Bell's vireo also occurs on-site. However, areas supporting willow occur in small disturbed patches adjacent to disturbed coastal brackish marsh.

9903 Businesspark Ave., Suite E, San Diego, CA 92131-1120
Phone: (858) 578-9064 ▲ Fax: (858) 578-3646
E-mail: TierraEnv@aol.com

Table 2. Least Bell's Vireo Focused Field Survey Conditions

Date of Survey	Time of Survey	Weather Conditions
April 19, 2002	0800 to 1000	70° F, 0 to 2mph wind, 60% cloud cover
May 5, 2002	0830 to 1030	70° F, 0 to 2 mph wind, 30% cloud cover
May 15, 2002	0915 to 1100	62 to 68° F, 0 to 3 mph wind, 100% cloud cover
June 20, 2002	0955 to 1030	68°F, 0 mph wind, 100% cloud cover
July 1, 2002	0945 to 1020	70°F, 3 mph SW, 80% cloud cover
July 9, 2002	0850 to 0925	70°F, 3 mph SW, 80% cloud cover
July 20, 2002	0950 to 1020	70°F, 0 mph, 0% cloud cover
July 30, 2002	0940 to 1010	69°F, 1 mph, 70% cloud cover

West of El Camino Real Road, the San Dieguito River is bordered on the south by agricultural fields and on the north by horse stables. East of El Camino Real, the San Dieguito River is bounded to the south by a golf course currently under construction and a recreational field to the north. Thick stands of willow, the preferred nesting sites for this species, are absent from the project site. Thus, habitats on-site are not ideal for this species. In addition, male and female cowbirds were observed on-site and in the neighboring horse stable. A complete list of bird species observed on-site is presented as attachment A.

Least Bell's vireo was not detected during the eight surveys. The absence of this species may be attributed to the degraded condition of the southern willow scrub habitat on-site.

I hope that this information is useful to you in your proposed El Camino Real Road/Bridge Widening Project. Please feel free to call me at (858) 575-9064 if you have any questions.

Sincerely,

Chris Nordby

Chris Nordby
Principal Biologist

Attachment A. Bird Species Observed in the El Camino Real Road Bridge/Widening Project Area

Scientific Name	Common Name	Number Observed/Habitat
Ardea herodias	great blue heron	1/DCBM
Ardea alba	great egret	1/DCBM
Ardea thula	snowy egret	1/DCBM
Anas platyrhynchos	mallard	3/DCBM
Anas cyanoptera	cinnamon teal	2/DCBM
Charadrius vociferus	killdeer	1/DIST
Sterna forsteri	Forster's tern	1/DCBM
Circus cyaneus	northern harrier	1/DIST
Buteo lineatus	red-shouldered hawk	1/EUC
Buteo jamaicensis	red-tailed hawk	1/OVR
Zenaida macroura	mourning dove	8/DIST
Aeronatus saxatalis	white throated swift	20/OVR
Chaetura vauxi	Vaux's swift	20/OVR
Calypte anna	Anna's hummingbird	5/MS
Selasphorus rufus	rufous hummingbird	1/MS
Sayornis nigricans	black phoebe	2/MS
Tyrannus vociferans	Cassin's kingbird	2/DIST
Corvus corax	common raven	1/OVR
Corvus brachyrhynchos	American crow	12/OVR
Stelgidopteryx serripennis	northern rough-winged swallow	30/DCBM
Petrochelidon pyrrhonota	cliff swallow	30/OVR
Psaltriparus minimus	bushtit	20/MS
Cistothorus palustris	marsh wren	5/DCBM
Starnus vulgaris	European starling	15/DIST
Phainopepla nitens	phainopepla	2/DCSS
Dendroica petchia	yellow warbler	6/DBM, DSWS
Geothlypis trichas	common yellowthroat	12/MS
Piranga ludoviciana	western tanager	1/DIST
Guiraca caerulea	blue grossbeak	1/MS
Pheucticus melanocephalus	black-headed grossbeak	1/DCSS
Pipilo crissalis	California towhee	2/DFM
Molothrus ater	brown-headed cowbird	3/DEV
Agelaius phoeniceus	red-winged blackbird	40/DCBM
Euphagus cyanocephalus	Brewer's blackbird	15/DCBM
Icterus cucullatus	hooded oriole	1/DIST
Carpodacus mexicanus	house finch	1/DIST
Carduelis psaltria	lesser goldfinch	9/ALL
Melospiza melodia	song sparrow	2/DIST
Passer domesticus	house sparrow	12/ORN

DCSS	Disturbed Diegan Coastal Sage Scrub
DMS	Disturbed Mulefat Scrub
DCBS	Disturbed Coastal Brackish Marsh
DSWS	Disturbed Southern Willow Scrub
OVR	Overhead
DIST	Disturbed
DEV	Developed
ALL	All areas listed above

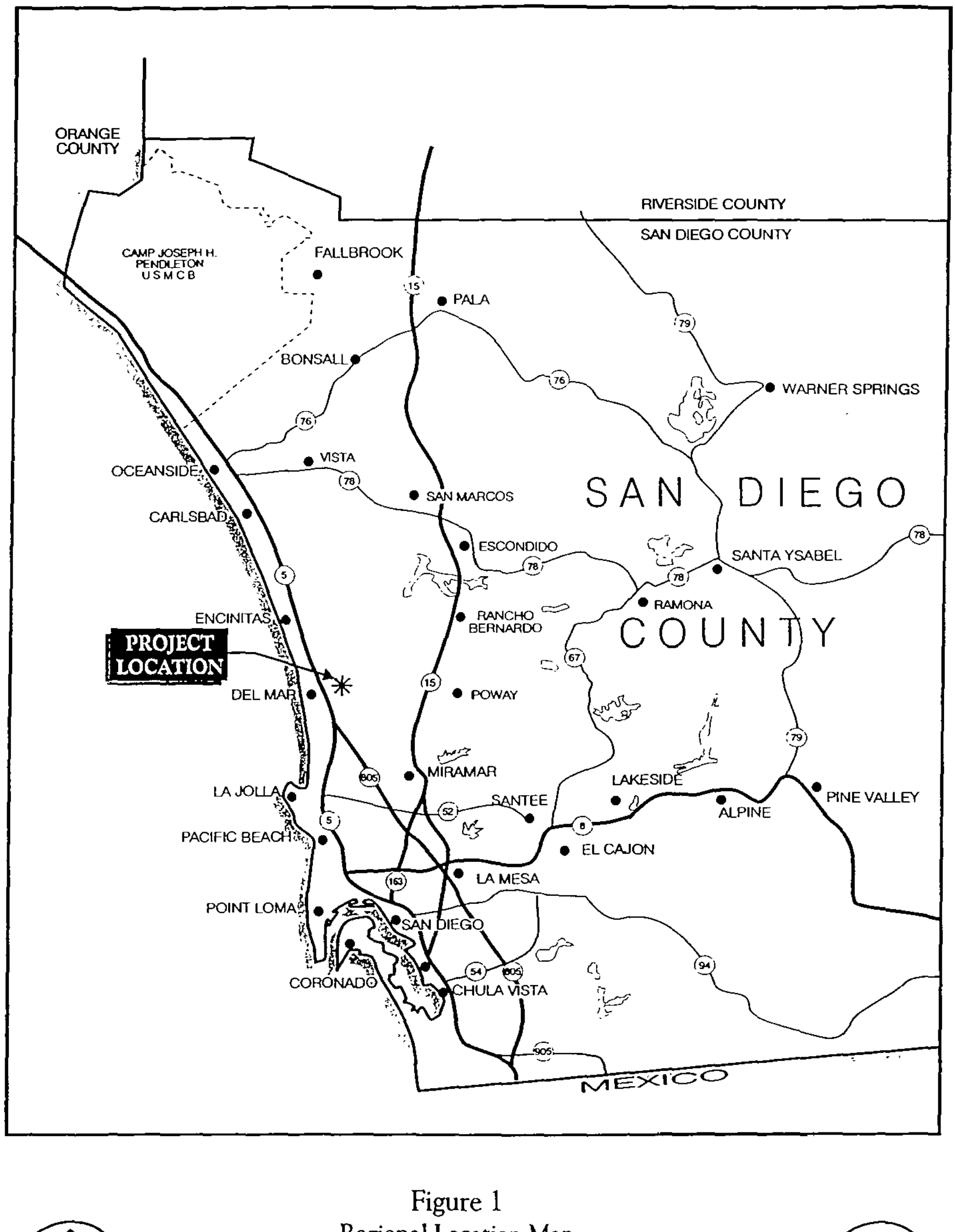


Figure 1
Regional Location Map

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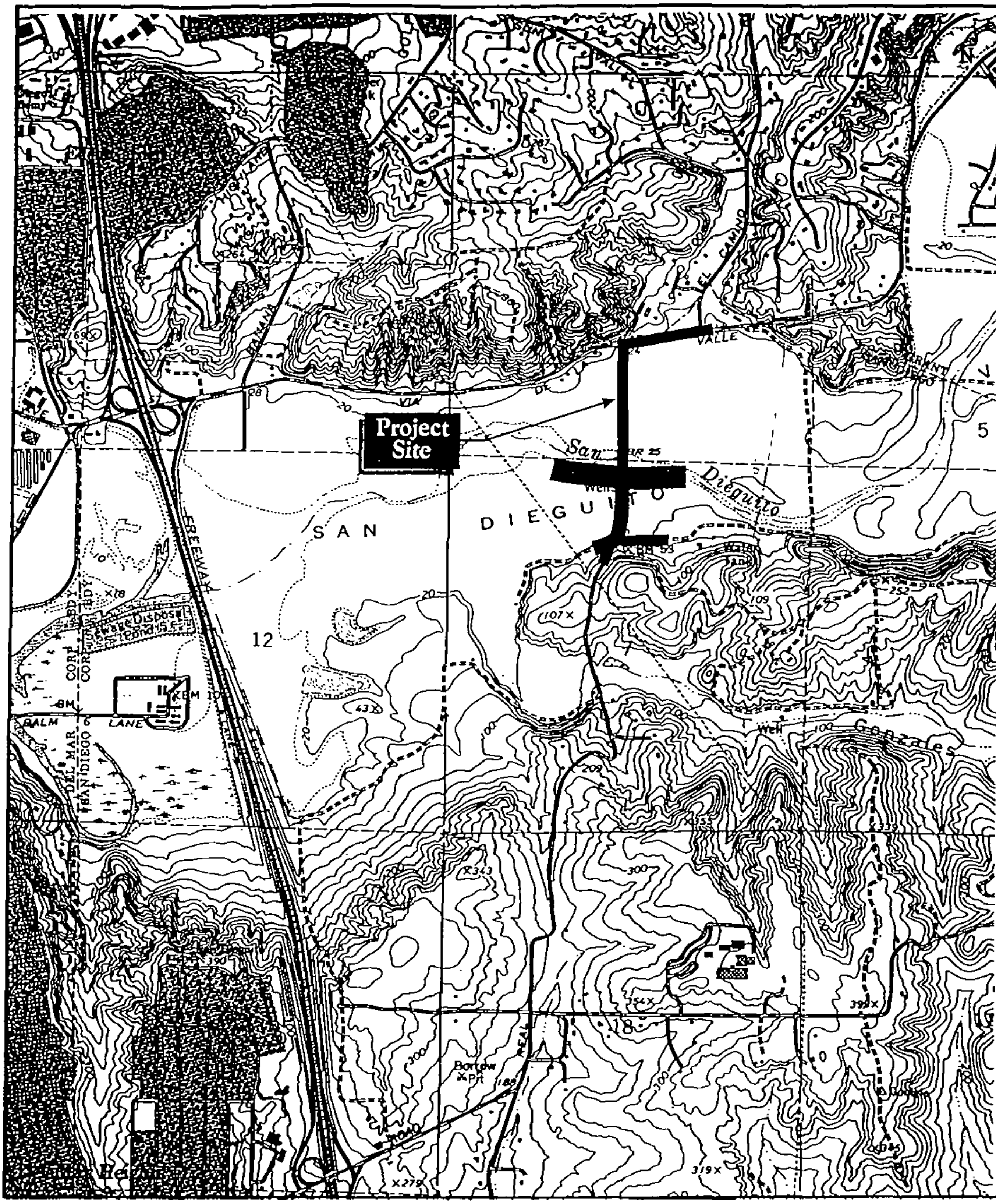

SOURCE: USGS 7.5' Quad Maps (Del Mar 1969 Edition Photorevised in 1975)

Figure 2
Project Location Map

0 1000 2000
FEET

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ENVIRONMENTAL SERVICES

Attachment H. Habitat Assessment Request for Pacific Pocket Mouse

TIERRA
ENVIRONMENTAL SERVICES

April 21, 1999

Mr. Mark Pavelka
U.S. Fish and Wildlife Service
2730 Loker Avenue West
Carlsbad, California 92008

Subject: Pacific Pocket Mouse Surveys for El Camino Real Bridge Replacement and Road Widening Project

Dear Mr. Pavelka:

This letter is to confirm recent discussions with you regarding surveys for the federally endangered Pacific Pocket Mouse (*Perognathus longimembris pacificus*) for the above-referenced project. As you may recall, I requested in late February 1999, that you conduct a habitat suitability assessment for the pocket mouse in the area of the proposed project which supports primarily ruderal vegetation on fill soils adjacent to the San Dieguito River. You informed me shortly thereafter that you had visited the site and, based on the soil and vegetation, did not feel that there was a need to conduct protocol trapping for the pocket mouse. To ensure that you understand the preferred project, I have included a figure that depicts the area that we propose to excavate along the southern bank of the river to accommodate future flood flows. The western portion is currently agricultural (tomato fields). The eastern portion is ruderal vegetation on fill soils.

I am submitting this letter on behalf of the City of San Diego and the prime contractor, EarthTech, to provide a record for our files. Should you disagree with the statements included herein, please respond prior to the end of the trapping season for this species so that the project is not delayed.

Thank you for your cooperation in this matter. Pleasc feel free to contact me directly at (619) 578-9064 if you have any questions.

Sincerely,

Chris Nordby

Chris Nordby
Principal Biologist

9903 Businesspark Ave., Suite E, San Diego, CA 92131-1120
Phone: (858) 578-9064 ▲ Fax: (858) 578-3646
E-mail: TierraEnv@aol.com

Attachment I. Wetland Delineation Forms

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: El Camino Real Applicant/Owner: City of San Diego Investigator: C Nordby, A. Eng	Date: 7/31/98 County: San Diego State: CA
Do Normal Circumstances exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a Potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: 1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Polypogon monspeliensis	herb	FACW+	1.		
2. Salicornia virginica	herb	OBL	2.		
3. Chenopodium sp.	herb	—	3.		
4. Rumex crispus	herb	FACW-	4.		
5. Cotula coronopifolia	herb	FACW+	5.		
6. Cynodon dactylon	herb	FAC	6.		
7. Sonchus oleraceus	herb	NI*	7.		
8.			8.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 71%

Remarks:

HYDROLOGY

__ Recorded Data (Describe in Remarks): __ Stream, Lake, or Tide Gauge __ Aerial Photographs __ Other ✓ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: __ Inundated __ Saturated in Upper 12 Inches __ Water Marks ✓ Drift Lines __ Sediment Deposits ✓ Drainage Patterns in Wetlands Secondary Indcators (2 or more required): __ Oxidized Root Channels in Upper 12 Inches ✓ Water-Stained Leaves __ Local Soil Survey Data __ FAC-Neutral Test __ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: — (in.) Depth to Saturated Soil: — (in.)	

Remarks:

SOILS

Map Unit Name (Series and Phase): GoA Grangeville fine sandy loam Taxonomy (Subgroup): ______	Drainage Class: ______ Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8	A	2.5Y 3/2			sandy clay w/gravel
8-14	B	2.5Y 3/2			gravel

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle) Wetland Hydrology Present? Yes No Hydric Soils Present? Yes No	(Circle) Is this Sampling Point Within a Wetland? Yes No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: El Camino Real Applicant/Owner: City of San Diego Investigator: C. Nordby, A. Eng	Date: 7/31/98 County: San Diego State: CA
Do Normal Circumstances exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a Potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: 2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salicornia virginica	herb	OBL	1.		
2. Polypogon monspeliensis	herb	FACW+	2.		
3. Rumex crispus	herb	FACW-	3.		
4. Sonchus oleraceus	herb	NI *	4.		
5. Xanthium spinosum	shrub	FAC+	5.		
6.			6.		
7.			7.		
8.			8.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 80 %

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ✓ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ✓ Water Marks ___ Drift Lines ___ Sediment Deposits ✓ Drainage Patterns in Wetlands
Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: — (in.) Depth to Saturated Soil: — (in.)	Secondary Indcators (2 or more required): ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): 90A Grangeville fine sandy loam Taxonomy (Subgroup): ______	Drainage Class: ______ Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-.5	A				litter
.5-8	B	2.5Y3/1			clayey sand
8-14	C				gravel

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ✓ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: gravel down at 8 inches and below

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)
Wetland Hydrology Present?	Yes	No	
Hydric Soils Present?	Yes	No	

(Circle)

Is this Sampling Point Within a Wetland? Yes No

Remarks:

/

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: El Camino Real Applicant/Owner: City of San Diego Investigator: C. Nordby, A Eng	Date: 7/31/98 County: San Diego State: CA
Do Normal Circumstances exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a Potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: ____ Transect ID: ____ Plot ID: 3

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salicornia virginica	herb	OBL	1.		
2. Cotula coronopifolia	herb	FACW+	2.		
3. Polypogon monspeliensis	herb	FACW+	3.		
4. Suaeda esteroa	herb	FACW+	4.		
5. Spergularia sp.	herb	—	5.		
6. Rumex crispus	herb	FACW-	6.		
7. Heliotropium curassavicum	herb	OBL	7.		
8. Lolium sp.	herb	—	8.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 75%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: — (in.)

Depth to Saturated Soil: — (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ✓ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ✓ Drainage Patterns in Wetlands

Secondary Indcators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): GoA Grangeville fine sandy loam Taxonomy (Subgroup): ______	Drainage Class: ______ Field Observations Confirm Mapped Type? Yes **No**

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-.5	A				organic layer
.5-8	B	10YR 3/2			dark clay
8-10	C	10YR 4/2			sandy
10-16	D	10YR 3/2			dark clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ✓ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes**	No	(Circle)
Wetland Hydrology Present?	**Yes**	No	
Hydric Soils Present?	**Yes**	No	

(Circle)

Is this Sampling Point Within a Wetland? **Yes** No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: El Camino Real Applicant/Owner: City of San Diego Investigator: C. Nordby, A. Eng	Date: 7/31/98 County: San Diego State: CA
Do Normal Circumstances exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a Potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: ___ Transect ID: ___ Plot ID: 4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salicornia virginica	herb	OBL	1.		
2. Polypogon monspeliensis	herb	FACW+	2.		
3. Distichlis spicata	herb	FACW	3.		
4. Lolium sp.	herb	-	4.		
5. Cynodon dactylon	herb	FAC	5.		
6. Rumex crispus	herb	FACW-	6.		
7.			7.		
8.			8.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 83%

Remarks:

HYDROLOGY

__ Recorded Data (Describe in Remarks): __ Stream, Lake, or Tide Gauge __ Aerial Photographs __ Other ✓ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: __ Inundated __ Saturated in Upper 12 Inches __ Water Marks __ Drift Lines __ Sediment Deposits ✓ Drainage Patterns in Wetlands Secondary Indcators (2 or more required): ✓ Oxidized Root Channels in Upper 12 Inches __ Water-Stained Leaves __ Local Soil Survey Data __ FAC-Neutral Test __ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: — (in.) Depth to Saturated Soil: — (in.)	

Remarks:

SOILS

Map Unit Name (Series and Phase): GoA Grangeville fine sandy loam Taxonomy (Subgroup):	Drainage Class: Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	A				organic layer
1-12	B	10YR 3/1			sandy clay
12-14	C	10YR 4/3			sand
14-16	D	10YR 3/1			clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ✓ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle) Wetland Hydrology Present? Yes No Hydric Soils Present? Yes No	(Circle) Is this Sampling Point Within a Wetland? Yes No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: El Camino Real Applicant/Owner: City of San Diego Investigator: C. Nordby, A. Eng	Date: 7/31/98 County: San Diego State: CA
Do Normal Circumstances exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a Potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: 5

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Lolium sp.	herb	–	1.		
2. Cynodon dactylon	herb	FAC	2.		
3. Rumex crispus	herb	FACW-	3.		
4. Polypogon monspeliensis	herb	FACW+	4.		
5.			5.		
6.			6.		
7.			7.		
8.			8.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 75%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ✓ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ✓ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ✓ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: — (in.) Depth to Saturated Soil: — (in.)	

Remarks:

SOILS

Map Unit Name (Series and Phase): GoA Grangeville fine sandy loam	Drainage Class: ____
Taxonomy (Subgroup): ____	Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1.5	A				organic layer
1.5-16	B	2.5Y 3/2			dark clay, sandy

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- _✓_ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)		(Circle)
Wetland Hydrology Present?	Yes	No			
Hydric Soils Present?	Yes	No		Is this Sampling Point Within a Wetland?	Yes No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: El Camino Real Applicant/Owner: City of San Diego Investigator: C. Nordby, A. Eng	Date: 7/31/98 County: San Diego State: CA
Do Normal Circumstances exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a Potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: ____ Transect ID: ____ Plot ID: 6

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salicornia virginica	herb	OBL	1.		
2. Polypogon monspeliensis	herb	FACW+	2.		
3. Rumex crispus	herb	FACW-	3.		
4. Chenopodium sp.	herb	-	4.		
5. Lolium sp.	herb	-	5.		
6.			6.		
7.			7.		
8.			8.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 60%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: — (in.)

Depth to Saturated Soil: — (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
✓ Drainage Patterns in Wetlands
Secondary Indcators (2 or more required):
✓ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): GoA Grangeville fine sandy loam Taxonomy (Subgroup): ______	Drainage Class: ______ Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-.5	A				organic layer
.5-10	B	2.5Y 3/2			Sandy clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ✓ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)	(Circle)
Wetland Hydrology Present?	Yes	No		
Hydric Soils Present?	Yes	No		Is this Sampling Point Within a Wetland? Yes No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: El Camino Real Applicant/Owner: City of San Diego Investigator: C. Woldoy, A. Eng	Date: 7/31/98 County: San Diego State: CA
Do Normal Circumstances exist on the site? Yes ~~Yes~~ No Is the site significantly disturbed (Atypical Situation)? Yes No Is the area a Potential Problem Area? Yes No (If needed, explain on reverse.)	Community ID: ____ Transect ID: ____ Plot ID: 7

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Polypogon monspeliensis	herb	FACW+	1.		
2. Suaeda taxifolia	herb	—	2.		
3. Rumex crispus	herb	FACW-	3.		
4. Lolium sp.	herb	—	4.		
5. Cotula coronopifolia	herb	FACW+	5.		
6. Spergularia sp.	herb	—	6.		
7. Distichlis spicata	herb	FACW	7.		
8. Cynodon dactylon	herb	FAC	8.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 62%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
 ___ Stream, Lake, or Tide Gauge
 ___ Aerial Photographs
 ___ Other
✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: — (in.)

Depth to Saturated Soil: — (in.)

Wetland Hydrology Indicators:
Primary Indicators:
 ___ Inundated
 ___ Saturated in Upper 12 Inches
 ___ Water Marks
 ___ Drift Lines
 ___ Sediment Deposits
 ___ Drainage Patterns in Wetlands
Secondary Indcators (2 or more required):
 ___ Oxidized Root Channels in Upper 12 Inches
 ___ Water-Stained Leaves
 ___ Local Soil Survey Data
 ___ FAC-Neutral Test
 ___ Other (Explain in Remarks)

Remarks: none

SOILS

Map Unit Name (Series and Phase): TuB Tujunga Sand	Drainage Class: ______
Taxonomy (Subgroup): ______	Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 3/3			sandy
12→	B				gravel

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Relatively dry

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)	(Circle)
Wetland Hydrology Present?	Yes	No		
Hydric Soils Present?	Yes	No		Is this Sampling Point Within a Wetland? Yes No

Remarks: not a wetland

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: El Camino Real Applicant/Owner: City of San Diego Investigator: C. Nordby, A. Eng	Date: 7/31/98 County: San Diego State: CA
Do Normal Circumstances exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a Potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: ____ Transect ID: ____ Plot ID: 8

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cynodon dactylon	herb	FAC	1.		
2. Rumex crispus	herb	FACW-	2.		
3. Polypogon monspeliensis	herb	FACW+	3.		
4. Lolium sp.	herb	—	4.		
5. Chenopodium sp.	herb	—	5.		
6. Distichlis spicata	herb	FACW	6.		
7.			7.		
8.			8.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 66%

Remarks:

HYDROLOGY

__ Recorded Data (Describe in Remarks):
__ Stream, Lake, or Tide Gauge
__ Aerial Photographs
__ Other
✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: — (in.)

Depth to Saturated Soil: — (in.)

Wetland Hydrology Indicators:
Primary Indicators:
__ Inundated
__ Saturated in Upper 12 Inches
__ Water Marks
__ Drift Lines
__ Sediment Deposits
✓ Drainage Patterns in Wetlands
Secondary Indcators (2 or more required):
✓ Oxidized Root Channels in Upper 12 Inches
__ Water-Stained Leaves
__ Local Soil Survey Data
__ FAC-Neutral Test
__ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): TuB Tujunga sand Taxonomy (Subgroup): ____	Drainage Class: ____ Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	A				organic layer
1-8	B	2.5Y 3/2			sandy clay
8-16	C	10YR 3/2			sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ✓ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)
Wetland Hydrology Present?	Yes	No	
Hydric Soils Present?	Yes	No	

(Circle)

Is this Sampling Point Within a Wetland? Yes No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: El Camino Real Applicant/Owner: City of San Diego Investigator: C. Nordby, A. Eng	Date: 7/31/98 County: San Diego State: CA
Do Normal Circumstances exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a Potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: ______ Transect ID: ______ Plot ID: 9

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cynodon dactylon	herb	FAC	1.		
2. Polypogon monspeliensis	herb	FACW+	2.		
3. Rumex crispus	herb	FACW-	3.		
4. Scirpus robustus	herb	OBL	4.		
5.			5.		
6.			6.		
7.			7.		
8.			8.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ✓ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ✓ Drainage Patterns in Wetlands Secondary Indcators (2 or more required): ✓ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: — (in.) Depth to Saturated Soil: — (in.)	

Remarks:

SOILS

Map Unit Name (Series and Phase): TuB Tujunga sand Taxonomy (Subgroup):	Drainage Class: Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	A				organic layer
1-16	B	2.5 Y 3/2			sandy clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ✓ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)	(Circle)
Wetland Hydrology Present?	Yes	No		
Hydric Soils Present?	Yes	No		Is this Sampling Point Within a Wetland? Yes No

Remarks: crayfish present

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: El Camino Real Applicant/Owner: City of San Diego Investigator: C. Nordby, A. Eng	Date: 7/31/98 County: San Diego State: CA
Do Normal Circumstances exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a Potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: ____ Transect ID: ____ Plot ID: 10

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Polypogon monspeliensis	herb	FACW+	1.		
2. Rumex crispus	herb	FACW-	2.		
3. Distichlis spicata	herb	FACW	3.		
4. Cotula coronopifolia	herb	FACW+	4.		
5. Scirpus robustus	herb	OBL	5.		
6.			6.		
7.			7.		
8.			8.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

__ Recorded Data (Describe in Remarks): __ Stream, Lake, or Tide Gauge __ Aerial Photographs __ Other ✓ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: __ Inundated __ Saturated in Upper 12 Inches __ Water Marks __ Drift Lines __ Sediment Deposits __ Drainage Patterns in Wetlands Secondary Indcators (2 or more required): __ Oxidized Root Channels in Upper 12 Inches __ Water-Stained Leaves __ Local Soil Survey Data __ FAC-Neutral Test __ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: — (in.) Depth to Saturated Soil: — (in.)	

Remarks: none

SOILS

Map Unit Name (Series and Phase): TuB Tujunga sand Taxonomy (Subgroup):	Drainage Class: Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		2.5Y3/2			sandy clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle) Wetland Hydrology Present? Yes No Hydric Soils Present? Yes No	(Circle) Is this Sampling Point Within a Wetland? Yes No

Remarks: outside, right on the edge
wetland area ~2 m wide

Attachment J. Updated Avian Habitat Assessment and Focused Survey Report

VARANUS MONITORING SERVICES, INC.

18 December 2004

Chris Nordby
Tierra Environmental Services
9903 Businesspark Avenue
San Diego, CA 92131-1120

Subject: Results of Avian Surveys and Habitat Assessment for the Light-footed Clapper Rail along the San Dieguito River in the vicinity of El Camino Real, San Diego County, California

Dear Chris,

On 17, 21 and 27 May 2004 I visited a portion of the San Dieguito River in the vicinity of El Camino Real between Del Mar and Rancho Santa Fe in San Diego County, California (Figure 1). The purpose of my visits was to conduct a general avian survey and to determine whether the area has the potential to support, or direct evidence to indicate occupation by, the state and federally endangered least Bell's vireo (*Vireo bellii pusillus*), the state and federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*), the state and federally endangered light-footed clapper rail (*Rallus longirostris levipes*), and the state endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*). Only the light-footed clapper rail, which is also a California Fully Protected Species, had been reported previously from the site (Konecny 2001).

Site Description

The study area is located in coastal northern San Diego County east of Del Mar and west of the community of Rancho Santa Fe. The focal area for the study was the San Dieguito River and its boundaries between latitude 32.97861, longitude -117.23495 and latitude 32.97809, longitude -117.22555 (Figure 2, which also depicts my survey route). Habitats within the survey area include southern willow scrub, Baccharis scrub, freshwater marsh, and patches of *Salicornia*-dominated brackish water marsh. Surrounding uplands are mostly disturbed: East of El Camino Real the Fairbanks Ranch Country Club golf course dominates the south side of the river and a large paddock and polo field dominate its north side. West of El Camino Real, a complex of horse stables borders the river to the north and agricultural fields border its southern edge (Figure 3).

INTRODUCTION TO FOCUS SPECIES

Least Bell's Vireo

USFWS: Endangered

CDFG: Endangered

The federally endangered Least Bell's Vireo is a small, insectivorous migratory songbird, the breeding range of which is southern California including portions of the California desert. Wintering in Baja California, Mexico, Least Bell's Vireos typically migrate northward to their breeding grounds in southern California between mid-March and mid-April, occasionally as late as early May. During the breeding season the Least Bell's Vireo inhabits an assortment of riparian forests. Dense low growing thickets of willows (*Salix* spp.), mule fat (*Baccharis salicifolia*), California blackberry (*Rubus ursinus*), Douglas' mugwort (*Artemisia douglasiana*) or other similar species are essential components of the habitat. An overstory composed of willows, cottonwoods (*Populus fremontii*), and/or sycamores (*Platanus racemosa*) is often present. Other nesting habitats are dense patches of herbaceous understory in Coast Live Oak Riparian Forest and Coast Live Oak Woodland, and occasionally patches of non-native habitat that now commonly form intricate mosaics with native habitats throughout the current breeding range of this species (W. Haas pers. obs).

Historically found throughout California from the northern Sacramento Valley south into Baja California, populations of the Least Bell's Vireo suffered from extensive habitat destruction and brood parasitism from the Brown-headed Cowbird (*Molothrus ater*) (Unitt 1984). Least Bell's Vireo population numbers declined dramatically between the 1940's and mid-1980's (Franzreb 1989). The State of California listed the Least Bell's Vireo as an endangered species in 1980; it was listed by the federal government as an endangered species in 1986 (U.S. Fish and Wildlife Service 1986). Since its listing and subsequent recovery actions, populations of the Least Bell's Vireo have increased through much of its current U.S. range (U.S. Fish and Wildlife Service 1998). In spite of its recovery, the Least Bell's Vireo is found only in riparian woodlands in southern California, with the majority of breeding pairs in San Diego, Santa Barbara, and Riverside Counties. Substantial vireo populations are currently found on six rivers in San Diego County: the Tijuana, the Sweetwater, the San Diego, the San Dieguito, the San Luis Rey, and the Santa Margarita. Smaller populations occur on other drainages.

Least Bell's Vireos arrive in San Diego County between the middle of March and mid-April, and occasionally as late as early May; they typically leave for their wintering grounds in September. For nesting and foraging, willows are the most frequently used tree species. Other plant species used for nesting and foraging include California wild rose (*Rosa californica*), poison oak (*Toxicodendron diversilobum*), mule fat, and occasionally, laurel sumac (*Malosma laurina*) and coast live oak. Vireos are also known to nest in non-native invasive vegetation such as black mustard (*Brassica nigra*) and giant reed (*Arundo donax*) (J. Greaves pers. com.); both plants are disturbance specialists that have become widespread throughout coastal southern California. In addition to foraging in riparian habitats, Vireos are known to forage in upland habitats adjacent to breeding sites, including coastal sage scrub and mesquite bosques (Kus and Miner 1989).

Because Least Bell's Vireos build their nests in shrubbery 3 to 4 feet above the ground (Salata 1984), they typically frequent young successional riparian habitat or older habitat with a well-developed understory. Similarly, Franzreb (1989) reports that a low, dense shrub layer is considered essential for nesting and nests are usually placed approximately one meter above the ground. Nests are also often placed along the edges of internal or external opening of riparian thickets, usually attached to a horizontal or pendant branch. Therefore, riparian plant succession is an important factor maintaining Least Bell's Vireo habitat.

Southwestern Willow Flycatcher

USFWS: Endangered

CDFG: Endangered

Willow Flycatchers have been recognized taxonomically as at least four distinct sub-species or races (Unitt 1987; Browning 1993). Of the four sub-species, only two are known to occur in San Diego County: the Northwestern Willow Flycatcher (*E. t. brewsteri*), a relatively common spring migrant, and the Southwestern Willow Flycatcher (*E. t. extimus*), a rare local breeding sub-species. Like the Least Bell's Vireo, Willow Flycatcher populations declined in the latter part of the 20th century primarily because of fragmentation and "extensive loss of riparian breeding habitat" (U. S. Fish and Wildlife Service 1995a); certain populations also suffered brood parasitism by the Brown-headed Cowbird (U. S. Fish and Wildlife Service 1995b). In response to its decline, the Southwestern Willow Flycatcher was listed as an endangered species by the federal government (U.S. Fish and Wildlife Service 1995a). This subspecies, along with all other subspecies of the willow flycatcher that occur within its venue, was previously listed as endangered by the California Department of Fish and Game in December 1990.

The Southwestern Willow Flycatcher is a riparian obligate during the breeding season and occurs as a summer breeding resident in southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, and southwestern Colorado. This species occurs primarily in older or mature riparian habitats, typically preferring stream side associations of willow, ash (*Fraxinus* spp.), and alder (*Alnus* spp.), usually characterized by a well developed herbaceous understory. Some populations thrive where the riparian vegetation is dense throughout. However, habitats that combine a dense overstory, uniform native herbaceous understory, and open areas for foraging appear to be optimal (W. Haas pers. obs.). One San Diego County population is unique in that coast live oaks (*Quercus agrifolia*) serve as the preferred nesting substrate; however, this preference is not expected elsewhere and appears to be related to the unique history of that population (Haas 2001). Southwestern Willow Flycatchers have also been found to nest in non-native tree species including Russian olive (*Elaeagnus angustifolia*) (Spencer *et al.* 1996) and salt cedar (*Tamarix* spp.) (U. S. Fish and Wildlife Service 1995a) W. Haas pers. obs).

Several other features play an important role in determining site suitability for this Flycatcher. Typically breeding habitat is more than ten meters (30 feet) wide and associated with open or running water (Sogge *et al.* 1997), or with minimally-saturated soils that persist throughout the breeding season. Sycamore woodlands, typically lacking an herbaceous understory, which is typically replaced by upland vegetation such as buckwheat (*Eriogonum* spp.) and redberry (*Rhamnus* spp.), are not suitable breeding habitats for Southwestern Willow Flycatchers (W. Haas pers. obs.).

Spring migration of the federally endangered subspecies (*extimus*) is relatively late, beginning in early May and extending through June (Unitt 1984). The northwestern subspecies (*brewsteri*), which breeds in the northern Sierra Nevada Mountains and the Cascade Range migrates through San Diego between early May and mid June (W. Haas pers. obs.). During the spring migration there is a period of overlapping occurrence in San Diego County riparian habitats for these two very similar looking subspecies. Fall migration of the locally breeding subspecies may occur rather early, beginning as early as late July; most young of the year, have departed by early September. Virtually all *extimus* have departed the state by mid-September (W. Haas pers. obs.). These birds are rarely observed in migration because they are few in number and do not appear to use migratory stopovers close to breeding sites.

The number of Southwestern Willow Flycatchers in San Diego County was estimated to be fewer than 15 pairs in the early 1980's (Unitt 1984). Unitt's estimate was probably conservative; at that time there was no well-developed protocol by which this species was sought out and fewer persons were involved in its detection. However, the species' status is probably not much changed since Unitt's publication; in San Diego County only two substantial breeding populations are known to remain: Along the Santa Margarita River within Camp Pendleton (approximately 25 – 30 pairs) (Kus *et al.* 2003) and along the upper San Luis Rey River (45 – 50 pairs) (Haas 2000, 2001).

Light-footed Clapper Rail

USFWS: Endangered

CDFG: Endangered

The light-footed clapper rail is a chicken-sized (32-41 cm in length, and between 160 and 400 g in weight) marsh bird with long legs; long, slightly decurved bill; a short, upturned tail; and barred flanks. Males average 20% larger than females (Edelman and Conway 1998). Both sexes have grayish brown to cinnamon brown plumage, which is darker dorsally than ventrally. Their flanks are barred white, dusky, and black. The base and sides of the bill are pinkish to bright orange in males and duller in females (*Ibid.* 1998). The light-footed clapper rail is a year-round, non migratory resident in coastal wetlands in Southern California and northern Baja California, Mexico.

Coastal salt marshes and lagoons are the preferred habitats of the light-footed clapper rail

(Wilbur 1974, Zembal and Massey 1983, Massey et al. 1984); however, the light-footed clapper rail may be found in freshwater and saltwater marshes containing California cordgrass (*Spartina foliosa*), cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), and other dense vegetation. Usually, occupied marshlands include a complex of marsh habitats (often referred to as lower, middle, and upper marshes), adjacent uplands, and a corresponding assortment of vegetation types.

In the lower marsh, plants generally are flooded twice each day at high tide. In San Diego County, typical species of the low-marsh include California cordgrass, dwarf glasswort (*Salicornia bigelovii*), and saltwort (*Batis maritima*). This is the primary breeding habitat of the light-footed clapper rail.

At slightly higher elevations (and typically slightly farther from tidal flows) there may be a middle marsh zone, where inundation may be regular but less frequent. Representative species of the middle marsh typically include saltmarsh dodder (*Cuscuta salina*), alkali heath (*Frankenia salina*), salty Susan (*Jaumea carnosa*), pickleweed (*Salicornia virginica*), estuary seablight (*Suaeda esteroa*), and arrowgrass (*Triglochin concinnum*). Foraging, dispersal and occasionally breeding may occur within this type of marshland.

Within the high marsh, where inundation is uncommon, a different suite of halophytic vegetation may occur, including salt flat succulent such as Parish's glasswort well as alkali weed (*Cressa truxillensis*), saltgrass (*Distichlis spicata*), spiny rush (*Juncus acutus*), western marsh-rosemary (*Limonium californicum*), and shoregrass (*Monanthochloe littoralis*). Forage for the light-footed clapper rail is scarce in this type of habitat and cover limited. Clapper rails are less likely to be found in such habitats; however, the high marsh may be extremely important during post-breeding dispersal and it may occasionally support breeding activity (for example, at the Carpinteria Marsh:(see Massey *et al.* 1984).

Where the light-footed clapper rail occurs in freshwater marsh, tall, reedy species such as bulrushes and cattails are always present. Other freshwater marsh species may also be found; however, there is one unifying factor at each site: surface water is always present (W. Haas pers. obs.).

Nesting

The birds nest in marsh vegetation (both freshwater and salt marsh plants) and forage in the marsh vegetation, on mud flats, in the waters of the marshes and occasionally in the maritime zone (U.S. Fish and Wildlife Service 1979). In salt marshes, light-footed clapper rails nest preferentially in California cordgrass, especially when it occurs in tall, dense stands (Jorgensen 1975, Massey and Zembal 1980, Massey *et al.* 1984). They also build nests in dense pickleweed (Bent 1926, Massey *et al.* 1984). The light-footed clapper rail can nest successfully in marshes where there is no cordgrass but where pickleweed is dense (Massey *et al.* 1984); however, nearby there must be a strong tidal influence, extensive mud flats, and/or stretches of open water, which are necessary to provide foraging habitats.

Freshwater marsh vegetation is also used for nesting. Nests have been documented in bulrushes and cattails in freshwater seeps along the edges of salt marshes (Massey et al. 1984). Anecdotal accounts of nests in freshwater marsh vegetation date back to the early in the 20th century (Willett 1912, Bent 1926). Recent records indicate that light-footed clapper rails have colonized several freshwater marsh habitats in San Diego County including within the Otay, Sweetwater, and San Dieguito rivers as well as along Aqua Hedionda Creek in San Diego County (W. Haas pers. obs.). In all cases, cordgrass, cattails, rushes, or other tall, dense vegetation are present.

Feeding

In coastal salt marshes, mud flats are the primary foraging habitat of the rails, and the invertebrates of the intertidal zone are their main food (Jorgensen 1975, Massey and Zembal 1980). In salt marshes, they have been observed eating a large variety of foods (Massey and Zembal 1980). In freshwater marsh light-footed clapper rails prey on snails, insects, and red swamp crayfish (*Procambarus clarkii*) (W. Haas pers. obs.). The latter is an exotic invasive species that is now ubiquitous in freshwater and brackish zones of tidal rivers and within rivers, lakes, streams and ponds throughout southern California; it is highly probable that the occurrence of this species has facilitated colonization of freshwater marsh habitats by the light-footed clapper rail.

Beldings' Savannah Sparrow

CDFG: Endangered

The Belding's savannah sparrow is a non-migratory passerine and one of the few bird species that remains within the salt marsh year round. It is a small (12 - 14 cm) bird with a conical bill; short, forked tail; white central crown stripe; brown upperparts with dark streaks; and white underparts with distinctive dark streaks. Similar to other subspecies of the savannah sparrow, Belding's has a yellow to cream-colored supercilium, often accompanied by a lighter yellowish wash to the cheeks. However, it is darker and more heavily streaked on the back, breast, and sides than most other races. Belding's savannah sparrows are ecologically associated with dense pickleweed, particularly *Salicornia virginica*, within which most nests are found (Zembal and Hoffman 2002). Breeding territories can be very small and they nest semi-colonially or locally concentrated within a larger block of habitat, all of which may appear generally suitable. They can be very secretive and may forage throughout a marsh, often well away from nesting sites (Bradley 1973, Massey 1979).

Nesting and Breeding

Nesting season is typically from March through July. The females build a nest above the highest tide line to avoid being flooded, usually at or near the ground.[i] The nest materials are comprised of pickleweed, twigs, and hair. Like most North American species of similar size, eggs are incubated for 12 - 14 days and thc young fledge in 10-14 days.

Belding's savannah sparrow nests are well camouflaged and may be difficult to locate within the salt marsh vegetation although nests in isolated patches of vegetation are often quite easily discovered (W. Haas pers. obs.). Nests are susceptible to abandonment by the adults if disturbed (Massey 1979). Although actual breeding territories of this rare passerine are located in the upper littoral zone dominated by pickleweed, foraging occurs throughout the marsh and along thc shoreline (Bradley 1973, Massey 1977, Massey 1979, Zembal *et al.* 1988), including along the edges of tidal pools. Males affirm their territoriality by singing, perching, chasing, and actual physical sparring with other Belding's (James and Stadtlander 1991).

METHODS

I conducted my site visits by walking along the edge of the river and along the horse trails that have been created along and through the river bottom in the vicinity of El Camino Real. I conducted no focused surveys, concentrating primarily on determining habitat suitability for several listed species. Audio tapes were not used; however, early morning surveys at the study site benefitted from spontaneous calling of most species (facilitated by the timing of the surveys at the peak of the breeding season for many of the occurring species). Spontaneous calling of light-footed clapper rails was stimulated by inter- (in response to the Virginia rail, *Rallus limicola*) and intra-specific territorial displays, and also by several ambient, anthropic stimuli including the "clappering" noise created by vehicles crossing a metal plate on the El Camino Real bridge that crosses over the San Dieguito River (directly above one clapper rail territory) and the chatter from the suspensions of water trucks as they dampened for dust control the road between the river and the paddock area along the northern edge of the river west of El Camino Real. An aerial photograph of the study area was used in addition to a hand-held Global Positioning System (GPS) data collector (Garmin Rino 110) to help ascertain the location and extent of the habitats present at the site.

RESULTS

General

A total of 34 bird species, 3 species of reptile, and 3 species of mammal were detected at the site (Table 2). Two locations for the least Bell's vireo were located in willow scrub west of El Camino Real and an extensive population of the light-footed clapper rail was found to inhabit the fresh-water marsh east of El Camino Real (Figure).

Least Bell's Vireo

Although habitat for the least Bell's vireo is limited in the project area (only the southern willow scrub and baccharis scrub offer suitable foraging and nesting habitat for the species), I found two territorial males, at least one of which was paired; the territories were located west of and within 200 meters of El Camino Real.

Southwestern Willow Flycatcher

I found no habitat adequate in size or character to support breeding of the southwestern willow flycatcher. Correspondingly, there was no evidence of their occurrence at the study site.

Light-footed Clapper Rail !

I found present at the site a significant population of the endangered Light-footed Clapper Rail (*Rallus longirostris levipes*). In the area I surveyed I detected a minimum 5 and possibly as many as 8 pairs of clapper rails (based on my interpretation of call pattern and type) and up to 10 or more territories (based on the number of locations from which I detected clappering calls from presumed adult male clapper rails). My survey did not include the area east of latitude 32.97809/ longitude -117.22555 where there is more suitable habitat that may support additional territories and pairs of this endangered species.

Belding's Savannah Sparrow

Habitat for the Belding's savannah sparrow is extremely limited within the study area. The habitat occurs in small patches, which may provide suitable habitat for transient use. However, there is insufficient habitat to support a breeding population of the species in the immediate area of the river in the vicinity of El Camino Real. Correspondingly, there was no evidence of their occurrence at the study site.

DISCUSSION

Possibly the most interesting of all my observations in this freshwater marsh was the detection of an advertising American bittern (*Botaurus americanus*), a species that is rarer in San Diego County than any of the endangered species I also found at the site. I have attached an Excel® file of the approximate locations of the clapper rails and the vireos as well as a map depicting the areas of their occurrence.

Least Bell's Vireo

In 2004, the study area supported at least two least Bell's vireo territories. One territory was occupied by a solitary (bachelor) adult male; a second territory was home to a pair of vireos. The least Bell's vireo favors relatively young successional stage riparian and riparian scrub habitats and although vireo- suitable habitat along the San Dieguito River is limited in this area, there is sufficient habitat to support several pairs. As the species continues to recover in southern California, its occurrence can be expected in small enclaves of suitable habitat (such as I found at the study site), especially in the years following breeding seasons of above average recruitment (e.g., 2003).

Southwestern Willow Flycatcher

Although it is possible that migrant northwestern willow flycatchers may be encountered in the limited area of willow scrub found near and around the site (tens of thousands of northwestern willow flycatchers annually migrate northward along the southern California coast), it is unlikely that even migrating individuals of the southwestern willow flycatcher (of which there are only 200 or so breeding pairs along the entire southern California coastal slope) would find, much less utilize, the extremely small patch of young riparian habitat that presently exists within the study area. Moreover, the riparian habitat is isolated from larger patches of more suitable habitat. Equally important with respect to the biology of the willow flycatcher - a colonially nesting species - the site is isolated from all nearby occupied sites. The closest occupied site is located along the San Dieguito River in San Pasqual Valley. That small meta-population consists of but four or five pairs of the flycatcher. Also, the San Pasqual Valley meta-population is isolated from the study site by Lake Hodges; the Lake Hodges Dam; unsuitable, sycamore-dominated riparian habitats below the dam; and a distance of approximately 22.5 kilometers (14 miles). Although the distance of the San Pasqual Valley meta-population is not sufficient to summarily exclude a potential relationship between sites, the limited amount of riparian habitat (in general) in the vicinity of El Camino Real, its lack of willow flycatcher-suitable breeding, and its isolated and fragmented context with respect to the San Pasqual Valley make the distance factor inconsequential for determining the potential of the site to support willow flycatchers.

Light-footed Clapper Rail

Because of the significance of the clapper rail population and to verify my observations, I shared my findings with John Konecny, a local expert on the clapper rail, who in turn contacted Dick Zembal (formerly of the U.S. Fish and Wildlife Service), who has studied the light-footed clapper rail in southern California for more than two decades. I met at the study site with Dick and John on 21 May. With the aid of audio-tape playback, Dick confirmed the presence of at least seven territories, which included at least five pairs of clapper rails. His estimates are conservative because of the time of day and his reluctance to unnecessarily disturb the birds in the middle of their breeding season. There is at least one-quarter mile of additional suitable habitat (and possibly more) that we did not access or survey.

Invasion of freshwater marsh by the light-footed clapper rail is a significant occurrence because of its implications to the recovery of the species, especially in view of the historic loss of so much of the salt water marshland along the California coast that formerly supported the species. Restoration of suitable habitat offers one means for promoting the species' recovery; however, there are few areas formerly occupied by the clapper rail that are available for restoration. Thus it is important to understand the biology of this species in freshwater marsh, of which the potential for creation and enhancement is much greater than along the coastal tidelands. Having observed light-footed clapper rails at fresh water sites since 1998, I have found that several factors appear to be critical to their invasion and survival. Two of these factors are characteristics of the San Dieguito River at the study site. They are: 1) The presence of introduced, year-round fresh water (which is, ironically, a resultant of increased domestic and commercial irrigation, including from golf courses such as the Fairbanks Ranch golf course that borders the San Dieguito River) and 2) the presence of adequate forage, ironic again in that clapper rails appear to exploit brown garden snails (*Helix aspersa*) and red swamp crayfish (*Procambarus clarkii*) both of which are also introduced in the local environment.

Belding's Savannah Sparrow

The Belding's savannah sparrow is an extremely vocal species during the breeding season

(February - June) and it is, moreover, prone to display from obvious perches, which makes it a relatively easy species to detect. No Belding's savannah sparrows were observed within the project area and it does not appear to be a breeding species in the project area at the present time. However, prior to any disturbance to *Salicornia* marsh during the savannah sparrow breeding period should be preceded by a breeding survey for the species.

CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for the requested biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Signed William E. Haas Date: 12/18/2004

William E. Haas, Principal Biologist

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Table 1

Survey Conditions

Avian Survey and Habitat Assessment of the San Dieguito River

Del Mar, San Diego County, California

Date - 2004	17 May	21 May	27 May
Start Time	530	1100	1830
End Time	1030	1330	2030
Temperature	65° - 78° F.	78° - 79° F.	76° - 73° F.
Wind Speed	0 mph	0-3 mph (from SW)	0 - 5 mph (fromSW)
Sky Condition	100% cover (80% at end of survey)	80% cover (40% at end of survey	Clear
Site Visit By	W. Haas	W. Haas, J. Konecny, D. Zembal	W. Haas, C. Nordby

Table 2a Vertebrate Species Detected in May, 2004 Survey Area along San Dieguito River Del Mar, San Diego County, California	
Common Name	**Scientific Name**
Birds	
Double-crested cormorant (overhead)	*Phalacrocorax auritus*
Great blue heron (overhead)	*Ardea herodius*
Great egret (overhead)	*Egretta alba*
Snowy egret (foraging in small pool)	*Egretta thula*
Green-backed heron	*Butorides virescens*
Black-crowned night heron	*Nycticorax nycticorax*
American bittern	*Botaurus lentiginosus*
White-faced ibis	*Plegadis chihi*
White-tailed kite	*Elanus leucurus*
Mallard	*Anas platyrhynchos*
Virginia rail	*Rallus limicola*
Light-footed clapper rail	*Rallus longirostris levipes*
American coot	*Fulica americana*
Killdeer	*Charadrius vociferus*
Mourning dove	*Zenaida macroura*
Anna's hummingbird	*Calypte anna*
Common raven (overhead)	*Corvus corax*
Northern rough-winged swallow (foraging)	*Stelgidopteryx serripennis*
Cliff swallow (foraging)	*Petrochelidon pyrrhonota*
Barn swallow (foraging)	*Hirundo rustica*
Bushtit (in upland habitat adjacent river)	*Psaltriparus minimus*
Cassin's kingbird	*Tyrranus vociferans*
European starling (overhead)	*Sturnus vulgaris*

Table 2a Vertebrate Species Detected in May, 2004 Survey Area along San Dieguito River Del Mar, San Diego County, California	
Northern mockingbird	*Mimus polyglottos*
Wrentit (in upland habitat adjacent river)	*Chamaea fasciata*
Common yellowthroat	*Geothlypis trichas*
Orange-crowned warbler	*Vermivora celata*
Song sparrow	*Melospiza melodia*
California towhee (in upland habitat)	*Pipilo fuscus*
Red-winged blackbird	*Agelaius phoeniceus*
Brewer's blackbird	*Euphagus cyanocephalus*
Brown-headed cowbird	*Molothrus ater*
House finch	*Carpodacus mexicanus*
Lesser goldfinch	*Carduelis psaltria*

Table 2b Vertebrate Species Detected in May, 2004 Survey Area along San Dieguito River Del Mar, San Diego County, California	
Common Name	***Scientific Name***
Reptiles	
San Diego alligator lizard	*Elgaria multicarinata webbi*
California side-blotched lizard	*Uta stansburiana elegans*
San Joaquin fence lizard	*Sceloporus occidentalis biseriatus*
Mammals	
San Diego pocket gopher	*Thomomys bottae sanctidiegi*
Desert cottontail	*Sylvilagus audubonii*
California ground squirrel	*Spermophilus beecheyi nudipes*

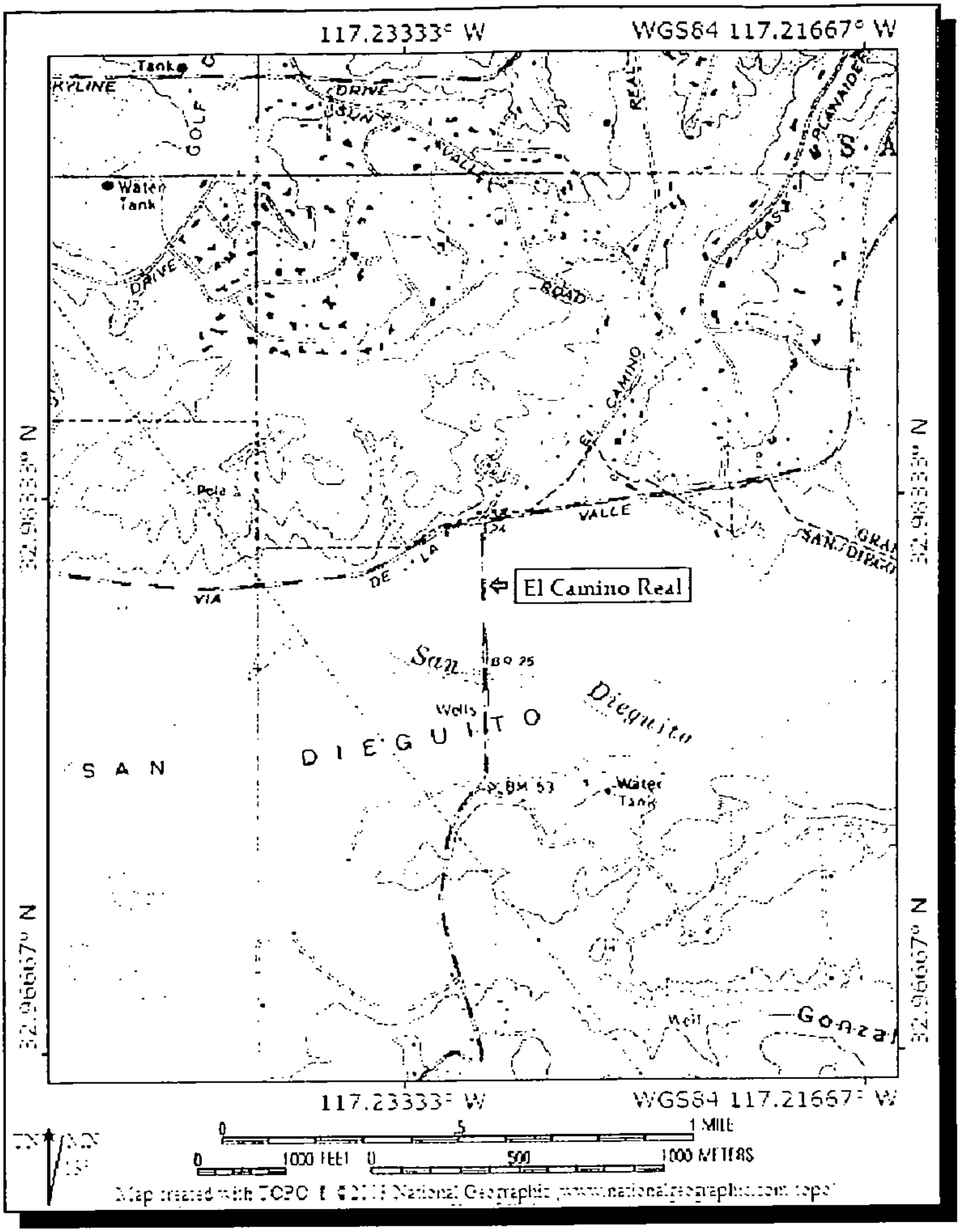


Figure 1. General Location of Project:

The San Dieguito River in the vicinity of El Camino Real.

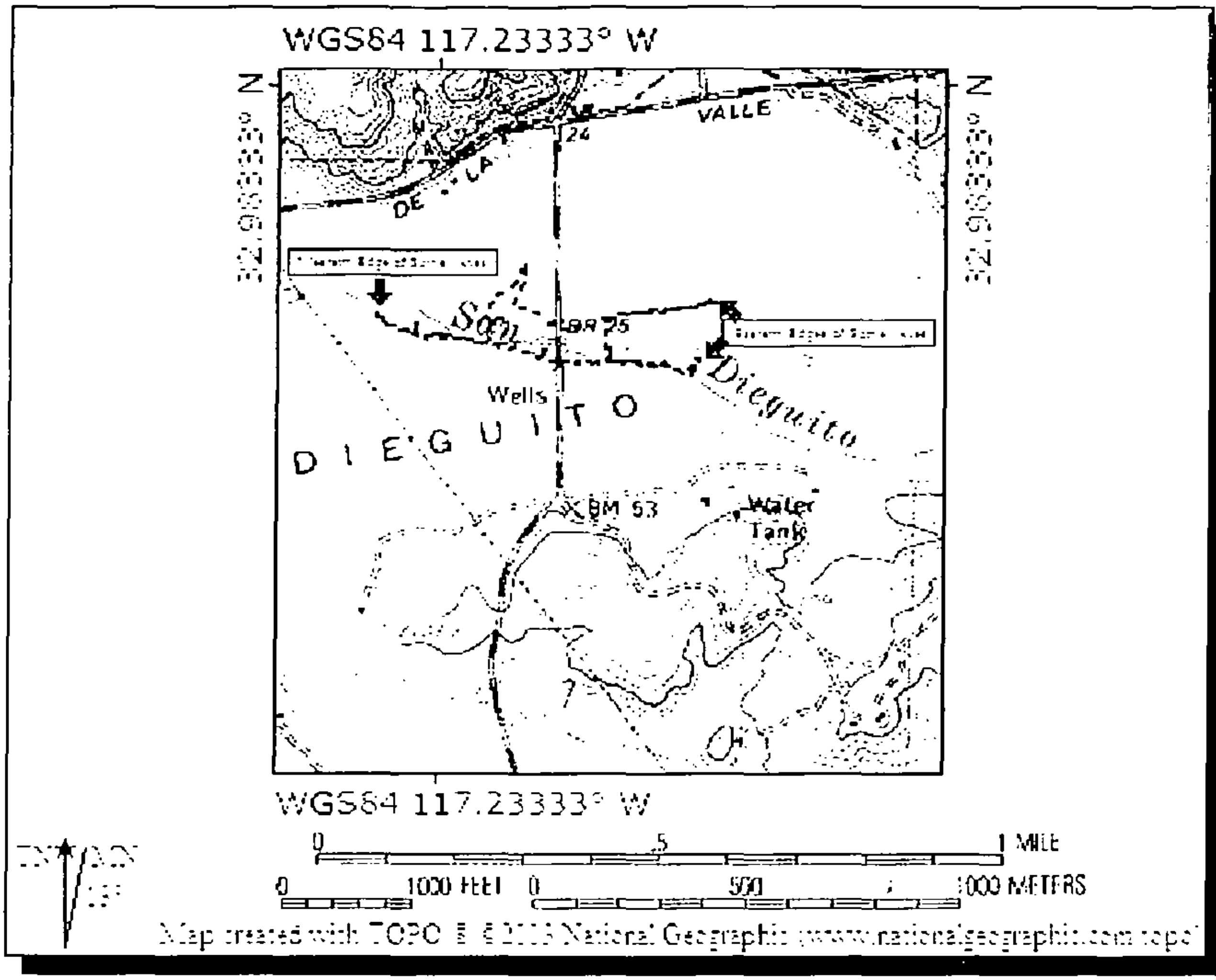


Figure 2. Survey Route along the San Dieguito River in the vicinity of El Camino Real

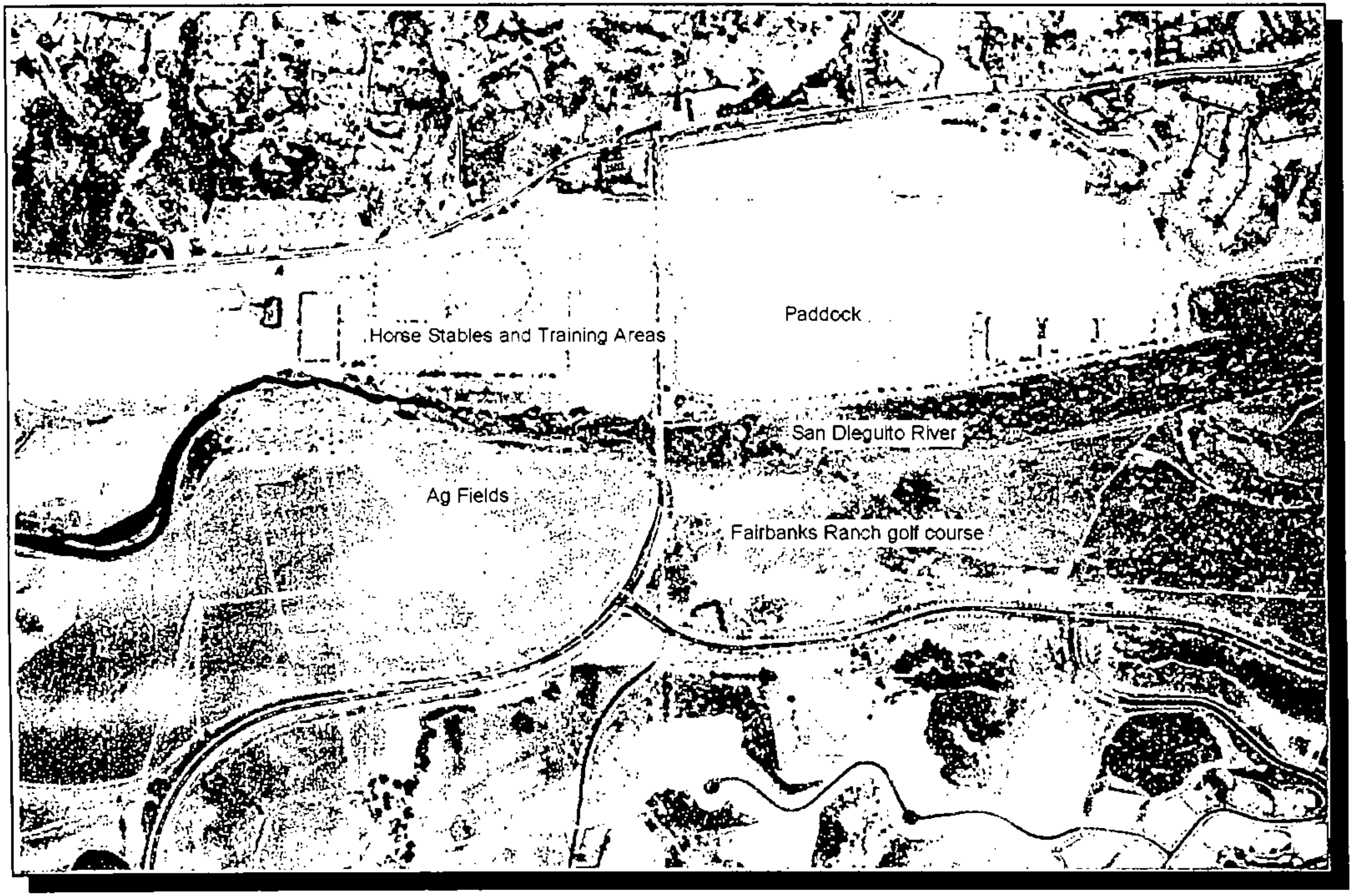


Figure 3. Aerial view of habitats surrounding El Camino Real/San Dieguito River study area

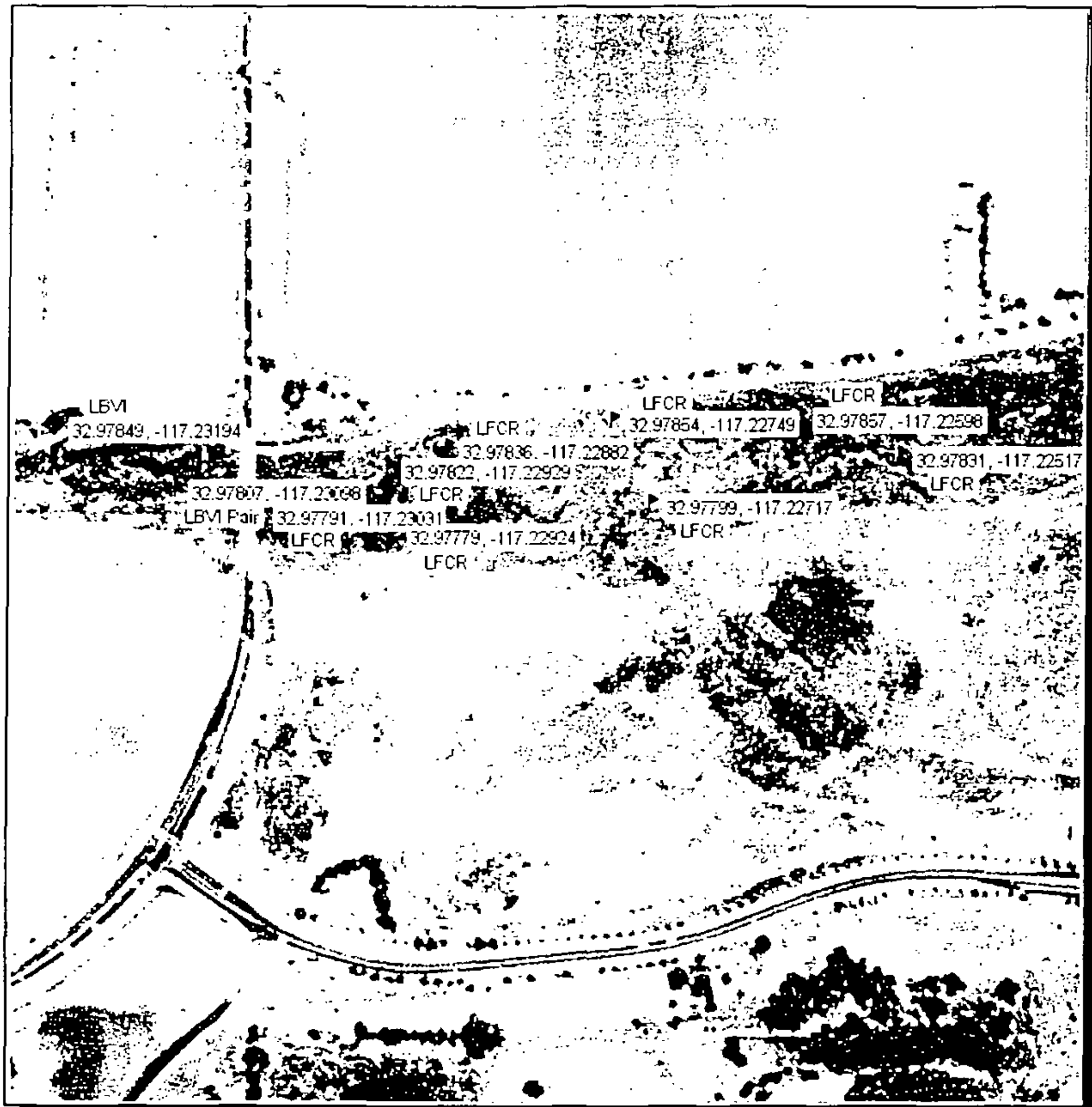
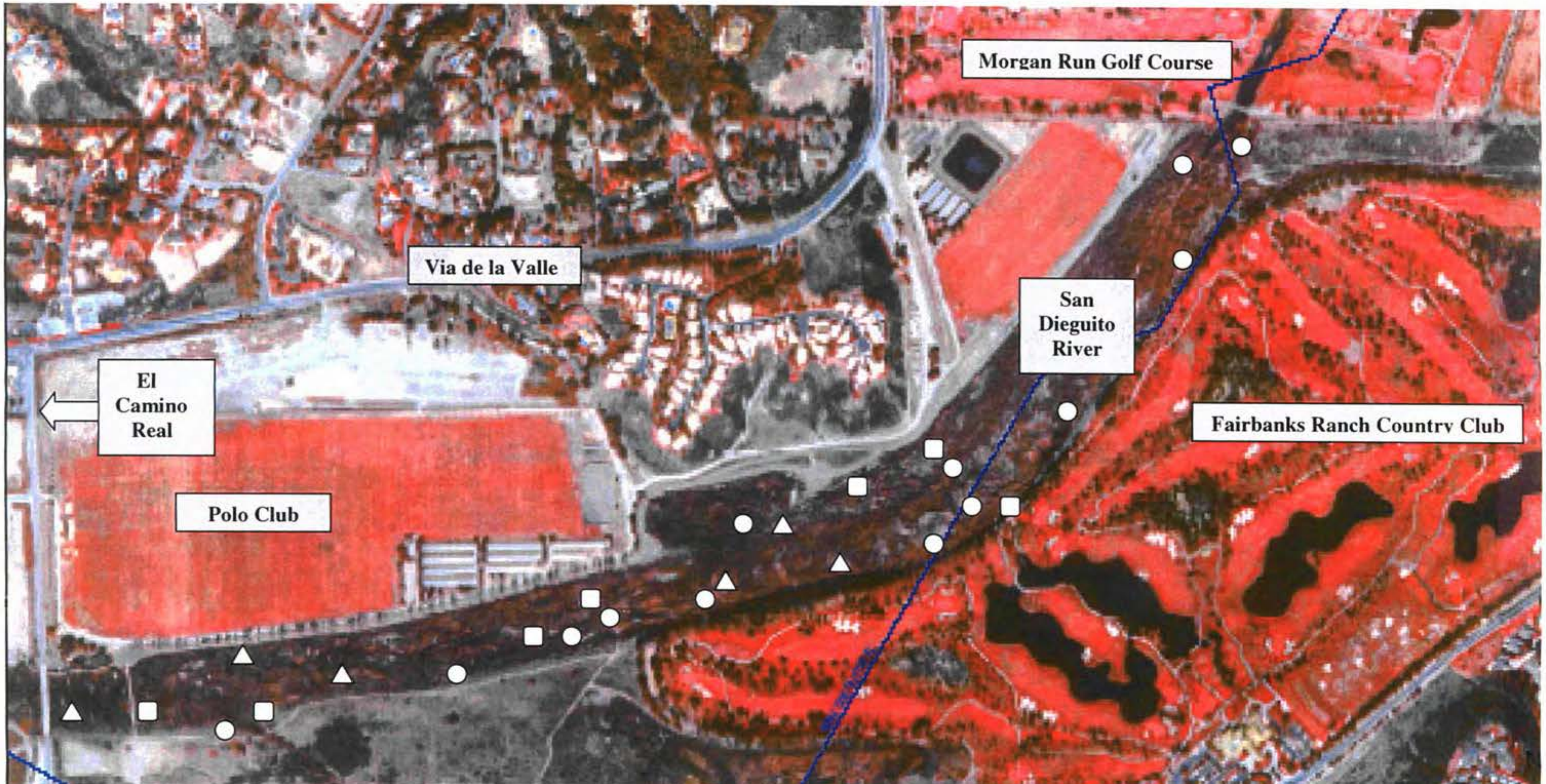


Figure 4. Aerial view of Least Bell's Vireos (LBVI) and Light-footed Clapper Rails (LFCR) locations along the San Dieguito River in the vicinity of El Camino Real, Del Mar, California.

Attachment K. Light Footed Clapper Rail Protocol Survey Results Provided by the California Department of Fish and Game

Light-footed clapper rail observations in San Dieguito River between the El Camino Real bridge and Morgan Run Golf Course; March 31, 2005 - - Richard Zembal and Susan Hoffman, in the afternoon using a tape along north and south banks of the River. Observations: 7 pairs, 6 males, and 13 singles clappering. The population estimate is 12 pairs. In the aerial below, ■ = pairs, ▲ = males, and ● = singles. Ignore the blue line.



El Camino Real Bridge Replacement Project ***NES***

Draft Natural Environment Study

Including Focused Studies for Special-Status Species and
a Delineation of Federal and State Jurisdictional Waters and Wetlands

El Camino Real

Between Via de la Valle and San Dieguito Road

San Diego County, California

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CALIFORNIA DEPARTMENT OF TRANSPORTATION

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STATE OF CALIFORNIA
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Summary

The El Camino Real Bridge Replacement Project (Project) is located in the City of San Diego in San Diego County, California. The site is located approximately 1.25 miles east of Interstate 5 (I-5). It is accessible from the east and west from Via de la Valle and from the south from Del Mar Heights Road. The road being modified is the segment of El Camino Real that extends from Via de la Valle to San Dieguito Road. The City of San Diego (City) proposes to modify this segment of El Camino Real and replace the bridge in order to improve the structural integrity of the bridge over the San Dieguito River, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, relieve traffic congestion, and improve consistency with the adopted land use plan in the Project area. Thus, the City is a “responsible agency” for the project. Four different alternatives have been analyzed: the Central Alignment Alternative, the Western Alignment Alternative, the Eastern Alignment Alternative, and the Roundabout Alignment Alternative; all four alternatives include demolition of the existing bridge.

Impacts to wetland and upland habitats will result from all four alternatives. Mitigation for impacts to wetlands resulting from the Western, Central and Eastern alignments will be accomplished in their entirety on a parcel owned by the San Dieguito River Park Joint Powers Authority (JPA) mitigation area. Should the Roundabout Alternative be selected, additional mitigation will be required beyond that available at the JPA mitigation site. This additional mitigation will be accomplished through a combination of wetland creation and enhancement on approximately 10.8 acres owned by the City immediately south of the JPA mitigation site and south of El Camino Real.

The JPA mitigation site is located west of El Camino Real and south of the San Dieguito River. Historically, this area has supported agricultural practices but has remained fallow for several years. This area has revegetated naturally, and currently supports native and nonnative vegetation. The mitigation site supports primarily disturbed Diegan coastal sage scrub – Baccharis dominated. This vegetation community is dominated by native coyote bush, also known as chaparral broom (*Baccharis pilularis*) and several non-natives species, including five-hook bassia (*Bassia hyssopifolia*), tree tobacco (*Nicotiana glauca*) and salt cedar (*Tamarix ramosissima*). This vegetation community comprises 14.3 acres (ac) of the 21.88-ac mitigation area. Also occurring within the mitigation site are isolated and/or degraded wetland and upland habitats that will be converted to high quality wetland habitats. These include areas of disturbed southern willow scrub (0.07 ac), alkali marsh (0.48 ac) dominated by alkali weed (*Cressa truxillensis*), disturbed wetland (0.23 ac) dominated by curly dock (*Rumex crispus*), disturbed land (3.48 ac) and a band of disturbed Diegan coastal sage scrub – coastal form that borders El Camino Real. These habitats, with the exception of the disturbed Diegan coastal sage scrub – coastal form, would be converted to high quality southern coastal freshwater marsh, mule-fat scrub and southern willow scrub habitats as mitigation for project impacts. Disturbed Diegan coastal sage scrub – coastal form will not be converted to wetland habitat but will be impacted by the bridge alternatives.

A protective berm will extend parallel to the San Dieguito River that will prevent sedimentation and scour during high flow event. An opening at the western extent of the berm will provide hydrological connection with the river. The berm will impact a total of 1.48 ac comprised of 1.13 ac of disturbed Diegan coastal sage scrub – Baccharis dominated, 0.03 ac of disturbed Diegan coastal sage scrub – coastal form, 0.21 ac of disturbed land and 0.11 ac of tamarisk scrub. No mitigation is required for disturbed land. Disturbed Diegan coastal sage scrub habitats will be mitigated at 1:1. Tamarisk scrub habitat impacted by the berm will be mitigated at 2:1, for a total mitigation for berm construction of 1.38 ac (1.16 ac combined disturbed Diegan coastal sage scrub habitats + 0.22 ac tamarisk scrub) leaving approximately 20.4 ac available for conversion to wetland habitats as mitigation. Thus, implementation of a mitigation project in this area will result in the conversion of existing upland habitats to wetland habitats, which will be treated as an impact. Mitigation for impacts to all uplands will be accomplished through a purchase of credits from the City's Cornerstone Lands. Purchase of credits from the Cornerstone Lands allows for preservation of high quality coastal sage scrub habitats mitigation for disturbed coastal sage scrub habitats that cannot be mitigated at the JPA mitigation site. A conceptual mitigation plan for the Project is illustrated in Figure 7 and is presented in detail in Appendix K.

The 10.8-ac parcel proposed for the additional mitigation for the Roundabout Alternative includes the opportunity for cismontane alkali marsh creation (approximately 3.1 acres) and freshwater marsh enhancement (approximately 2.9 acres), which are both adjacent to the proposed wetland creation and enhancement areas for the St. John Garabed Church Project (Dudek 2013). This potential mitigation site is illustrated in Figure 8 and is presented in detail in Appendix K. The potential cismontane alkali marsh creation area is currently dominated by disturbed habitat including non-native invasive plants such as Bermuda grass (*Cynodon dactylon*) and mustards (*Brassica* spp.) as observed during a site visit on December 8, 2014 and during surveys conducted for the St. John Garabed Church Project (Dudek 2013). The potential freshwater marsh enhancement area contains freshwater marsh habitat dominated by cattail (*Typha* sp.) and bulrush (*Schoenoplectus* sp.) with non-natives including tamarisk, castor bean (*Ricinus communis*), and pampas grass (*Cortaderia jubata*).

The Biological Study Area (BSA) includes the footprint of all of the combined potential alternative alignments as illustrated in Figure 5. The BSA supports disturbed southern willow scrub, mule-fat scrub, disturbed mule-fat scrub, coastal freshwater marsh, disturbed coastal freshwater marsh, disturbed coastal brackish marsh, disturbed southern coastal salt marsh, disturbed wetland, alkali marsh, disturbed Diegan coastal sage scrub – coastal form, Disturbed coastal sage scrub – Baccharis dominated, tamarisk scrub, disturbed land, eucalyptus woodland, ornamental, bare ground, and urban/developed areas.

The boundaries of a proposed mitigation site for the constructed Fairbanks Ranch Project occur within the BSA. The proposed Fairbanks Ranch mitigation area extended from the existing El Camino Real Bridge eastward along the banks of the San Dieguito River and consisted of modification of the banks of the river to support riparian habitat, including southern willow scrub. However, because this project's mitigation effort was never implemented, impacts to these areas are not assessed as impacts to a mitigation site but are called out separately in this report. The Fairbanks Ranch Mitigation site consists of two areas situated beneath the existing bridge. One of the sites occurs on the south bank of the river, 0.1 ac, and the other occurs on the north bank of the river, 0.4 ac. Thus, project impacts to the Fairbanks Ranch Mitigation site total 0.5 ac.

The Project will result in impacts to depleted native vegetation communities, jurisdictional habitats, and special-status species. The term "depleted" is used to identify habitats that are considered sensitive that have historically been impacted and are currently more restricted in their distribution, such as freshwater marsh. Table S-1 presents a comparison of the impacts associated with each of the four alternatives and the JPA mitigation area. Impacts and mitigation measures associated with each of the four alternatives and with implementation of a mitigation plan within the JPA mitigation area are summarized for each alternative and are presented below and in Tables S-2 through S-5.

The Project has the potential to impact a population of the federally-listed endangered and state-listed endangered and Fully Protected Species light-footed clapper rail (*Rallus longirostris levipes)* that occupy the freshwater marsh habitat associated with the San Dieguito River, as well as other sensitive species. Approximately 45 paired and unpaired individual rails were censused in the San Dieguito River in 2012 from approximately the El Camino Real Bridge to several miles upstream of the bridge. Potential project impacts and proposed minimization and avoidance measures are presented in detail in Chapter 4.

Tables S-1 through S-5 identify temporary and permanent impacts for jurisdictional wetland habitats only in order to facilitate the determination of the Least Environmentally Damaging Practicable Alternative (LEDPA) pursuant to Section 404 of the Clean Water Act. For mitigation purposes, all impacts were considered to be permanent due to temporal loss of habitats during the 2-3 year long construction period and will be mitigated at a minimum at ratios designated in the City of San Diego's Land Development Guidelines (2002). The 2002 guidelines are considered relevant as the project has been deemed "substantially complete" by the City as of April 25, 2002.

In some cases mitigation is proposed at ratios that exceed the City's guidelines. For example, mitigation for all Project impacts to wetland habitats occurring within and outside of the City of San Diego Coastal Overlay Zone are proposed at the higher Coastal Zone Overlay ratios although impacts may occur outside of this zone. These higher ratios are proposed due to the sensitive nature of the Project and to offset temporal losses during construction. Detailed discussion of temporary versus permanent impacts or effects is presented in Appendix H.

In some cases, mitigation is proposed at ratios that are lower than the City's guidelines. Such accounting has been proposed for impacts associated with conversion of isolated and degraded wetlands located within the JPA's mitigation site to high quality wetlands. The City's 2002 guidelines call for mitigation ratios for wetland impacts ranging from 2:1 to 4:1; however, the 2002 guidelines allow that state and federal resource agencies may override City guidelines. All state and federal regulatory agencies involved with the mitigation plan have agreed that a 1:1 mitigation ratio at the JPA mitigation site is acceptable. Detailed discussion of proposed mitigation, including ratios that exceed City guidelines, is presented in Chapter 4.

All proposed mitigation is habitat based. For example, impacts to freshwater marsh, whether disturbed or undisturbed, are proposed to be mitigated at a 4:1 ratio per the City's Land Development Code, Biology Guidelines (2002). By mitigating for impacts at a habitat level, potential impacts to sensitive animal species will also be mitigated. Potential impacts to sensitive plant species may be further mitigated by planting such species from seed or container stock at the proposed mitigation site.

Table S-1. All Alternatives—Summary of Impacts

Sensitive Resource	Western Alignment Alternative Impacts (Acres)	Central Alignment Alternative Impacts (Acres)	Eastern Alignment Alternative Impacts (Acres)	Roundabout Alignment Alternative Impacts (Acres)	JPA Mitigation Area
Disturbed southern willow scrub	0.30	0.06	0.12	0.31	0.07
Mule-fat scrub	0.0	0.037	0.22	0.22	0.0
Mule-fat scrub[1]	0.0	0.012	0.068	0.068	0.0
Disturbed mule-fat scrub	0.06	0.10	0.25	0.25	0.0
Tamarisk scrub	0.19	0.0	0.003	0.003	1.33
Coastal freshwater marsh	0.48	0.69	1.19	1.27	0.0
Coastal freshwater marsh[1]	0.0023	0.004	0.004	0.0041	0.0
Disturbed coastal freshwater marsh	0.34	0.35	0.38	0.38	0.0
Disturbed southern coastal salt marsh	2.43	2.75	2.27	3.79	0.0
Alkali marsh	0.0	0.0	0.0	0.03	0.48
Disturbed wetland	0.27	0.60	0.07	0.11	0.23
Total Wetland Impacts	4.07	4.60	4.57	6.44	2.11
Disturbed Diegan coastal sage scrub – coastal form	0.45	0.515	0.40	0.92	0.03
Disturbed Diegan coastal sage scrub – coastal form[1]	0.0	0.038	0.037	0.037	0.0
Disturbed Diegan coastal sage scrub – Baccharis dominated	0.46	0.21	0.0002	0.06	14.3
Non-native grassland	0.0	0.0	0.0	0.0	0.004
USACE/RWQCB Jurisdictional areas	Permanent: 2.76 Temporary: 0.6	Permanent: 3.69 Temporary: 0.94	Permanent: 2.64 Temporary: 1.65	Permanent: 4.23 Temporary: 1.84	Permanent: 0.0 Temporary: 0.0
CDFW Jurisdictional areas	Permanent: 2.92 Temporary: 1.14	Permanent: 3.67 Temporary: 0.93	Permanent: 2.84 Temporary: 1.73	Permanent: 4.63 Temporary: 1.81	Permanent: 0.11 Temporary: 2.0
Palmer's sagewort (*Artemisia palmeri*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	4 individuals	4 individuals	None	None	None
San Diego sunflower (*Bahiopsis laciniata*) Occurs in disturbed Diegan coastal sage scrub – coastal form.	None	None	None	16 individuals and a 0.03-acre patch	None

Table S-1, continued

Sensitive Resource	**Western Alignment Alternative Impacts (Acres)**	**Central Alignment Alternative Impacts (Acres)**	**Eastern Alignment Alternative Impacts (Acres)**	**Roundabout Alignment Alternative Impacts (Acres)**	**JPA Mitigation Area**
San Diego marsh-elder (*Iva hayesiana*) Occurs in disturbed and undisturbed coastal freshwater marsh.	1 individual	None	None	None	6 individuals
Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) Occurs in disturbed and undisturbed coastal freshwater marsh and disturbed southern willow scrub.	None	2 individuals	41 individuals	41 individuals	1 individual
Northern harrier (*Circus cyaneus*) Occurs throughout the BSA.	None	None	None	None	Create/ enhance suitable habitat
Clark's marsh wren (*Cistothorus palustris clarkae*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Remove occupied habitat	Remove occupied habitat	Remove occupied habitat	Create/ enhance suitable habitat
Yellow warbler (*Dendroica petechia*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove suitable habitat	Remove suitable habitat	Remove suitable habitat	Remove suitable habitat	Create/enhance suitable habitat
White-tailed kite (*Elanus leucurus*) Occurs in disturbed Diegan coastal sage scrub - Baccharis dominated	None	None	None	None	Create/Enhance foraging habitat
Yellow-breasted chat (*Icteria virens*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove suitable habitat	Remove suitable habitat	Remove occupied habitat	Remove occupied habitat	Create/enhance suitable habitat
Light-footed clapper rail (*Rallus longirostris levipes*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Remove occupied habitat	Remove occupied habitat	Remove occupied habitat	Create/enhance occupied habitat

Table S-1, continued

Sensitive Resource	Western Alignment Alternative Impacts (Acres)	Central Alignment Alternative Impacts (Acres)	Eastern Alignment Alternative Impacts (Acres)	Roundabout Alignment Alternative Impacts (Acres)	JPA Mitigation Area
Least Bell's vireo (*Vireo bellii pusillus*) Occurs in disturbed mule-fat scrub, disturbed southern willow scrub.	Remove occupied habitat	Remove occupied habitat	Remove occupied habitat	Remove occupied habitat	Create/enhance occupied habitat
Nesting Birds and Raptors May occur throughout the BSA.	Remove suitable nesting habitat	Remove suitable nesting habitat	Remove suitable nesting habitat	Remove suitable nesting habitat	Create/enhance suitable nesting habitat

[1] Fairbanks Mitigation Site
USACE = U.S. Army Corps of Engineers
RWQCB = Regional Water Quality Control Board
CDFW = California Department of Fish and Wildlife

Western Alignment Alternative. Road and bridge improvement activities associated with the Western Alignment Alternative will result in a total of 4.0723 ac of impacts to wetland habitats requiring 15.0092 ac of mitigation (Tables S-2 and 4-1). Impacts include 0.30 ac of disturbed southern willow scrub, 0.06 ac of disturbed mule-fat scrub, 0.48 ac of coastal freshwater marsh, 0.0023 ac of coastal freshwater marsh situated within Fairbanks Mitigation Site, 0.34 ac of disturbed coastal freshwater marsh, 2.43 ac of disturbed southern coastal salt marsh, 0.27 ac of disturbed wetland, and 0.19 ac of tamarisk scrub. Road and bridge improvement activities will impact a total of 0.91 ac of sensitive upland habitats, including 0.45 ac of disturbed Diegan coastal sage scrub – coastal form and 0.46 ac of disturbed Diegan coastal sage scrub – Baccharis dominated.

Impacts to all wetland habitats associated with the road and bridge improvement and impacts associated with implementation of mitigation measures will be mitigated at the 21.88 ac JPA mitigation site. There are 20.4 ac available for mitigation once the 1.48 ac protective berm is constructed. Mitigation for 1.48 ac impacted by the berm will be accomplished as follows: 1.16 ac of disturbed upland habitats mitigated at 1:1 ratio through purchase of credits from the City's Cornerstone Lands; 0.11 ac of tamarisk scrub mitigated at 2:1 through 0.22 ac of wetland creation on the JPA site; no mitigation necessary for 0.21 ac of disturbed land impacted by the berm.

JPA Mitigation Site. Proposed mitigation at the JPA mitigation site will result in impacts to a total of 2.11 ac of isolated, disturbed wetland habitats requiring mitigation of 2.22 ac. These include 0.07 ac disturbed southern willow scrub, 0.48 alkali marsh, 0.23 ac disturbed wetland and 1.33 ac tamarisk scrub. All impacts except for 0.11 ac of tamarisk scrub (impacted by berm construction) will be considered temporary as the implementation of mitigation will involve converting low quality habitat to relatively high quality habitat. Mitigation for these impacts will be accomplished on-site at a 1:1 ratio. Impacts to 0.11 ac of tamarisk scrub are considered to be permanent and will be mitigated at a 2:1 ratio.

Sensitive upland habitats that would be impacted by mitigation implementation include 14.3 ac of disturbed Diegan coastal sage scrub – Baccharis dominated, 0.03 ac of disturbed Diegan coastal sage scrub – coastal form and 0.04 ac of non-native grassland. Of the 14.33 ac of disturbed Diegan coastal sage scrub, 1.16 ac of impact occurs as a result of berm construction; the remaining 13.17 ac of impact will result from conversion of upland to wetland habitat. The 0.04 ac of non-native grassland will also be converted to wetland habitat. As stated previously, all impacts to sensitive upland habitats will be mitigated through purchase of credits from the City's Cornerstone Lands.

Mitigation for the Western Alignment Alternative. Impacts to 0.82 ac of combined disturbed southern willow scrub, disturbed mule-fat scrub, tamarisk scrub and disturbed wetland will be mitigated at 3:1 and 2:1 ratios at the 3 ac mule-fat scrub/southern willow scrub creation component, exceeding mitigation requirement by 1 ac creation. An additional 2 ac of mule-fat scrub/southern willow scrub enhancement is proposed in exceedance of City requirements. The additional acreage is proposed to partially offset temporal impacts to light-footed clapper rails during construction. These habitats serve as foraging/refugia for clapper rails.

Impacts to 0.8223 ac of disturbed and undisturbed coastal freshwater marsh and 2.43 ac of disturbed southern coastal salt marsh will be mitigated at a 4:1 ratio through the creation of 13.0092 ac of coastal freshwater marsh at the 15.4 ac freshwater marsh creation component, exceeding City requirements by 2.3908. This additional acreage is proposed to offset temporal impacts to clapper rails.

Total wetland mitigation requirements for the Western Alignment Alternative equals 17.2292a c (15.0092 ac + 2.22 ac; Table S-2). Thus, the proposed 20.4 ac JPA mitigation site exceeds City requirements by 3.1708 ac.

Impacts to sensitive upland habitats, including 0.91 ac of disturbed Diegan coastal sage scrub associated with road and bridge improvement and the remaining 14.33 ac disturbed Diegan coastal sage scrub and 0.04 ac of non-native grassland associated with the JPA mitigation site, will be mitigated through purchase of credits from the City's Cornerstone Lands.

The Western Alignment Alternative will result in permanent impacts to 2.76 ac and temporary impacts to 0.6 ac of U.S. Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB) jurisdictional areas. This includes permanent impacts to 0.83 ac and temporary impacts to 0.55 ac of wetland waters of the U.S., and permanent impacts to 1.93 ac and temporary impacts to 0.5 ac of adjacent wetlands.

The Western Alignment Alternative will also result in permanent impacts to 2.92 ac and temporary impacts to 1.14 ac of California Department of Fish and Wildlife (CDFW) jurisdictional areas. This includes 0.83 ac of permanent impacts and 0.64 ac of temporary impacts to CDFW state streambed, and 2.09 ac of permanent impacts and 0.5 ac of temporary impacts to CDFW riparian habitat.

Impacts to jurisdictional habitats associated with the JPA mitigation site include permanent impacts to 0.11 ac of CDFW jurisdictional area associated with the berm (tamarisk scrub) and 2.0 ac temporary impacts to CDFW jurisdictional areas associated with mitigation activities. There are no impacts to USACE or RWQCB jurisdictional areas associated with the JPA mitigation site.

The Western Alignment Alternative will also result in direct impacts to four individuals of Palmer's sagewort (*Artemisia palmeri*) and one individual of San Diego marsh-elder (*Iva* *hayesiana*). Palmer's sagewort and San Diego marsh-elder would be included in the plant palette used in the creation and enhancement of southern willow scrub/mule-fat scrub in the JPA mitigation area as mitigation for impacts to individuals of these species. Final success criteria for the JPA mitigation area will require the presence of Palmer's sagewort and San Diego marsh-elder prior to final site signoff. This alternative will also result in impacts to occupied habitat for Clark's marsh wren (*Cistothorus palustris clarkae*), light-footed clapper rail and least Bell's vireo (*Vireo bellii pusillus*). Habitat-based mitigation would occur at mitigation ratios established by the City in the Biology Guidelines (City of San Diego 2002), including 4:1 for Clark's marsh wren habitat, 4:1 for light-footed clapper rail habitat, and 3:1 for least Bell's vireo habitat.

Six San Diego marsh-elder and one southwestern spiny rush will be impacted by mitigation activities at the JPA site. These species will be included in the plant palette used in creation and enhancement of southern willow scrub/mule-fat scrub in the JPA mitigation area as mitigation for impacts to individuals of these species. Final success criteria for the JPA mitigation area will require the presence of southwestern spiny rush and San Diego marsh-elder prior to final site signoff. Implementation of the mitigation plan in this area would result in the creation of higher quality habitat for these species.

Restoration activities will also result in impacts to occupied habitat for northern harrier (*Circus cyaneus*), yellow warbler (*Dendroica petechia*), and white-tailed kite (*Elanus leucurus*). Impacts to sensitive habitats and species on the proposed JPA mitigation site, as well as proposed mitigation measures to offset those impacts, have been incorporated into Tables S2 - S5 below. Habitat-based mitigation for species that occupy upland habitats, such as white-tailed kite, will be accomplished at a 2:1 ratio through purchase of credits from the City's Cornerstone Lands. Habitat-based mitigation for species that occupy disturbed, isolated wetland habitats on the JPA site will be provided through conversion to higher quality wetlands at a 1:1 ratio.

Additional measures have been incorporated into all alternatives to minimize impacts from construction to least Bell's vireo and light-footed clapper rail. These are presented in detail in Chapter 4 and include limiting work within appropriate least Bell's vireo and clapper rail habitat during the combined breeding season of these species (February 1 to September 30); noise reduction measures to minimize indirect impacts to clapper rail associated with construction within occupied habitat during the non-breeding season; maintenance of a wildlife corridor beneath the bridge during all phases of construction to allow movement by wildlife, including clapper rails; removal of all vegetation within the construction footprint prior to construction in occupied habitat to discourage use of the area by clapper rails and other secretive species; education of all construction personnel regarding the sensitivity of the area and the species that inhabit it and design features implemented to minimize impacts; and, regular inspection of the site by a qualified biologist to determine the effectiveness of minimization measures on clapper rail during all phases of construction.

Because least Bell's vireo is a migratory species and construction within occupied habitat is restricted to the non-breeding season, no indirect impacts to this species are anticipated. Measures to minimize impacts from construction during the non-breeding season are more applicable to the resident light-footed clapper rail.

Raptors have been reported to nest as early as December or January in San Diego County. Prior to any construction outside of the February 1 to September 30 breeding season, a qualified biologist will conduct a search for any nesting raptors. Should nesting by raptors occur within the project area, appropriate buffers will be established and maintained until the young fledge. Provisions for protecting nesting birds are presented in detail in Section 5.2.

Table S-2. Western Alignment Alternative—Summary of Impacts and Associated Mitigation Measures

Biological Resource	Impact	Mitigation Measure
Wetland impacts associated with road and bridge improvement		
Disturbed southern willow scrub	Remove: 0.30 ac	Habitat-based mitigation at 3:1 ratio.
Disturbed mule-fat scrub	Remove: 0.06 ac	Habitat-based mitigation at 3:1 ratio.
Coastal freshwater marsh	Remove: 0.48 ac	Habitat-based mitigation at 4:1 ratio.
Coastal freshwater marsh[1]	Remove: 0.0023 ac	Habitat-based mitigation at 4:1 ratio.
Disturbed coastal freshwater marsh	Remove: 0.34 ac	Habitat-based mitigation at 4:1 ratio.
Disturbed southern coastal salt marsh	Remove: 2.43 ac	Habitat-based mitigation at 4:1 ratio.
Disturbed wetland	Remove: 0.27 ac	Habitat-based mitigation at 2:1 ratio.
Tamarisk scrub	Remove: 0.19 ac	Habitat-based mitigation at 2:1 ratio.
Subtotal wetland impacts associated with road and bridge improvement	**4.0723 ac**	Habitat-based mitigation of 15.0092 acres
Wetland impacts associated with JPA mitigation site		
Disturbed southern willow scrub	Remove 0.07 ac	Habitat-based mitigation at 1:1 ratio.
Alkali marsh	Remove 0.48 ac	Habitat-based mitigation at 1:1 ratio.
Tamarisk scrub	Remove 1.22	Habitat-based mitigation at 1:1 ratio.
Tamarisk scrub (berm)	Remove 0.11	Habitat-based mitigation at 2:1 ratio.
Disturbed wetland	Remove 0.23 ac	Habitat-based mitigation at 1:1 ratio.
Subtotal wetland impacts associated with JPA mitigation site	**2.11 ac**	Habitat-based mitigation of 2.22 acres
Total wetland impacts	**6.1823**	Habitat-based mitigation of 17.2292 ac
Upland impacts associated with road and bridge improvement		
Disturbed Diegan coastal sage scrub – coastal form	Remove: 0.45 ac	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – Baccharis dominated	Remove: 0.46 ac	Habitat-based mitigation at 1:1 ratio.
Subtotal upland impacts associated with road and bridge improvement	**0.91 ac**	Habitat- based mitigation of 0.91 ac
Upland impacts associated with JPA mitigation site		
Disturbed Diegan coastal sage scrub – coastal form (berm)	Remove 0.03 ac	Habitat-based mitigation at 1:1 ratio.

Table S-2, continued

Biological Resource	Impact	Mitigation Measure
Disturbed Diegan coastal sage scrub – Baccharis dominated (berm)	Remover 1.13 ac	Habitat-based mitigation at 1:1 ratio
Disturbed Diegan coastal sage scrub – Baccharis dominated	Remove 13.17 ac	Habitat-based mitigation at 1:1 ratio.
Non-native grassland	Remove 0.04 ac	Habitat-based mitigation at 1:1 ratio.
Subtotal upland impacts associated with JPA mitigation site	**14.37 ac**	Habitat-based mitigation of 14.33 ac
Total upland impacts	**15.28 ac**	Habitat-based mitigation of 15.24 ac
Impacts to jurisdictional habitats associated with road and bridge improvement		
USACE Jurisdictional areas	Permanent: 2.76 ac Temporary: 0.6 ac	Permits/approvals will be required.
CDFW Jurisdictional areas	Permanent: 2.92 ac Temporary: 1.14 ac	Permits/approvals will be required
Impacts to jurisdictional habitats associated with JPA mitigation site		
CDFW Jurisdictional areas	Permanent: 0.11 ac Temporary: 2.0 ac	Permits/approvals will be required.
Total impacts to jurisdictional habitats		
USACE Jurisdictional areas	Permanent: 2.76 ac Temporary: 0.6 ac	Permits/approvals will be required.
CDFW Jurisdictional areas	Permanent: 3.03 ac Temporary: 3.14 ac	Permits/approvals will be required
Impacts to sensitive species associated with road and bridge improvement		
Palmer's sagewort (*Artemisia palmeri*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove 4 individuals	Palmer's sagewort to be included in plant palette used for southern willow scrub/mule-fat scrub enhancement and creation in the JPA mitigation area.
San Diego marsh-elder (*Iva hayesiana*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove 1 individual	San Diego marsh-elder to be included in plant palette used for southern willow scrub/mule-fat scrub enhancement and creation in the JPA mitigation area.
Clark's marsh wren (*Cistothorus palustris clarkae*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season.
Light-footed clapper rail (*Rallus longirostris levipes*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season. Additional measures will be implemented to minimize indirect impacts from construction during the non-breeding season
Least Bell's vireo (*Vireo bellii pusillus*) Occurs in disturbed mule-fat scrub, disturbed southern willow scrub.	Remove occupied habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur outside of the breeding season.

Table S-2, continued

Biological Resource	Impact	Mitigation Measure
Nesting Birds and Raptors May occur throughout the BSA.	Remove suitable nesting habitat	Removal of vegetation will occur during the non-breeding season or would be allowed during the breeding season if a nesting bird and raptor survey is conducted and has negative findings or if suitable buffers are placed around the active nest and no construction activities occur within the buffer until the nest is no longer active.
Impacts to sensitive species associated with JPA mitigation site		
San Diego marsh-elder (*Iva hayesiana*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove 6 individuals	San Diego marsh-elder to be included in plant palette used for marsh creation in the JPA mitigation area.
Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) Occurs in disturbed and undisturbed coastal freshwater marsh and disturbed southern willow scrub.	Remove 1 individual	Southwestern spiny rush to be included in plant palette used for marsh creation in the JPA mitigation area. No mitigation required.
Northern harrier (*Circus cyaneus*) Occurs throughout the BSA.	Remove occupied habitat	Removal of vegetation will occur during the non-breeding season. Create/enhance occupied habitat.
Yellow warbler (*Dendroica petechia*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove suitable habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur during the non-breeding season.
White-tailed kite (*Elanus leucurus*) Occurs in disturbed diegan coastal sage scrub -*Baccharis* dominated.	Remove occupied habitat	Removal of vegetation will occur during the non-breeding season. Create/enhance occupied habitat.
Light-footed clapper rail (*Rallus longirostris levipes*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season. Additional mitigation measures will be implemented to minimize indirect impacts from construction during the non-breeding season
Least Bell's vireo (*Vireo bellii pusillus*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove occupied habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur during the non-breeding season.
Nesting Birds and Raptors May occur throughout the BSA.	Remove suitable nesting habitat	Removal of vegetation will occur during the non-breeding season or would be allowed during the breeding season if a nesting bird and raptor survey is conducted and has negative findings or if suitable buffers are placed around the active nest and no construction activities occur within the buffer until the nest is no longer active.

[1]Within Fairbanks Mitigation Site

Central Alignment Alternative. Road and bridge improvement activities associated with the Central Alignment Alternative will result in a total of 4.599 ac of impacts to wetland habitats requiring 16.98 ac of mitigation. Impacts include 0.06 ac of disturbed southern willow scrub, 0.0379 ac of mule-fat scrub, 0.012 ac of mule-fat scrub within the Fairbanks Mitigation Site, 0.10 ac of disturbed mule-fat scrub, 0.686 ac of coastal freshwater marsh, 0.004 ac of coastal freshwater marsh within the Fairbanks Mitigation Site, 0.35 ac of disturbed coastal freshwater marsh, 2.75 ac of disturbed southern coastal salt marsh and 0.60 ac of disturbed wetland. Road and bridge improvement activities will result in impacts to a total of 0.763 ac of sensitive upland habitats, including 0.515 ac of disturbed Diegan coastal sage scrub – coastal form, 0.038 ac of disturbed Diegan coastal sage scrub – coastal form within the Fairbanks Mitigation Site and 0.21 ac of disturbed Diegan coastal sage scrub – Baccharis dominated.

JPA Mitigation Site. Impacts to wetland and sensitive upland habitats associated with the implementation of mitigation measures at the JPA site are identical to those presented for the Western Alignment and are not repeated here. These impacts and mitigation measures are summarized below in Table S-3.

All wetland impacts associated with road and bridge improvements as well as implementation of mitigation measures will be mitigated at the 21.88 ac JPA mitigation site. There are approximately 20.4 ac available for mitigation once the 1.48 ac protective berm is constructed (no mitigation for 0.21 ac disturbed land; 1.16 ac of disturbed Diegan coastal sage scrub habitats mitigated at1:1; 0.11 ac of tamarisk scrub converted to upland mitigated at 2:1 for a total mitigation of 1.38 ac).

Mitigation for the Central Alignment Alternative. Impacts to 0.8099 ac of combined disturbed southern willow scrub, disturbed mule-fat scrub, tamarisk scrub and disturbed wetland will be mitigated at 3:1 and 2:1 ratios at the 3 ac mule-fat scrub/southern willow scrub creation component, exceeding mitigation requirement by 1.18 ac creation. An additional 2 ac of mule-fat scrub/southern willow scrub enhancement is proposed in exceedance of City requirements. The additional acreage is proposed to partially offset temporal impacts to light-footed clapper rails during construction. These habitats serve as foraging/refugia for clapper rails.

Impacts to 1.04 ac of disturbed and undisturbed coastal freshwater marsh and 2.75 ac of disturbed southern coastal salt marsh will be mitigated at a 4:1 ratio through the creation of 15.16 ac of coastal freshwater marsh at the 15.4 ac freshwater marsh creation component, exceeding City requirements by 0.24 ac. This additional acreage is proposed to offset temporal impacts to clapper rails.

The Central Alignment Alternative will require total mitigation for impacts to wetlands of 19.2 ac (16.98 + 2.22; Table S-3) exceeding City requirements by 1.2 ac.

Impacts to sensitive upland habitats, including 0.763 ac of disturbed Diegan coastal sage scrub associated with road and bridge improvement and 14.33 ac of disturbed Diegan coastal sage scrub associated with the JPA mitigation site (13.17 ac uplands converted to wetlands; 1.16 ac uplands impacted by berm), and 0.04 ac non-native grassland converted to wetland will be mitigated through purchase of credits from the City's Cornerstone Lands.

The Central Alignment Alternative will result in permanent impacts to 3.69 ac and temporary impacts to 0.94 ac of USACE and RWQCB jurisdictional areas. This includes permanent impacts to 1.50 ac and temporary impacts to 0.38 ac of wetland waters of the U.S., and permanent impacts to 2.19 ac and temporary impacts to 0.56 ac of adjacent wetlands.

The Central Alignment Alternative will also result in permanent impacts to 3.67 ac and temporary impacts to 0.93 ac of CDFW jurisdictional areas. This includes 1.50 ac of permanent impacts and 0.37 ac of temporary impacts to CDFW state streambed, and 2.17 ac of permanent impacts and 0.56 ac of temporary impacts to CDFW riparian habitat.

Impacts to jurisdictional habitats associated with the JPA mitigation site include permanent impacts to 0.11 ac of CDFW jurisdictional area associated with the berm (tamarisk scrub) and 2.0 ac temporary impacts to CDFW jurisdictional areas associated with mitigation activities. There are no impacts to USACE or RWQCB jurisdictional areas associated with the JPA mitigation site.

The Central Alignment Alternative will also result in direct impacts to four individuals of Palmer's sagewort and two individuals of southwestern spiny rush (*Juncus acutus* ssp. *Leopoldii*). Palmer's sagewort and southwestern spiny rush would be included in the plant palette used in the creation and enhancement of southern willow scrub/mule-fat scrub in the JPA mitigation area as mitigation for impacts to individuals of these species. Final success criteria for the JPA mitigation area will require the presence of Palmer's sagewort and southwestern spiny rush prior to final site signoff. This alternative will also result in impacts to occupied habitat for Clark's marsh wren, light-footed clapper rail, and least Bell's vireo. Habitat-based mitigation will occur at mitigation ratios established by the City in the Biology Guidelines (City of San Diego 2002), including 4:1 for Clark's marsh wren habitat, 4:1 for light-footed clapper rail habitat, and 3:1 for least Bell's vireo habitat.

Additional measures have been incorporated in all alternatives to minimize the impacts from construction activities to least Bell's vireo and light-footed clapper rail. These are presented in detail in Chapter 4 and are summarized in the description of the western alignment.

Table S-3. Central Alignment Alternative—Summary of Impacts and Associated Mitigation Measures

Biological Resource	Impact	Mitigation Measure
Wetland impacts associated with road and bridge improvement		
Disturbed southern willow scrub	Remove: 0.06 ac	Habitat-based mitigation at 3:1 ratio.
Mule-fat scrub	Remove: 0.0379 ac	Habitat-based mitigation at 3:1 ratio.
Mule-fat scrub [1]	Remove: 0.012 ac	Habitat-based mitigation at 3:1 ratio.
Disturbed Mule-fat scrub	Remove: 0.10 ac	Habitat-based mitigation at 3:1 ratio.
Coastal freshwater marsh	Remove: 0.686 ac	Habitat-based mitigation at 4:1 ratio.
Coastal freshwater marsh[1]	Remove: 0.004 ac	Habitat-based mitigation at 4:1 ratio.
Disturbed coastal freshwater marsh	Remove: 0.35 ac	Habitat-based mitigation at 4:1 ratio.
Disturbed southern coastal salt marsh	Remove: 2.75 ac	Habitat-based mitigation at 4:1 ratio.
Disturbed wetland	Remove: 0.60 ac	Habitat-based mitigation at 2:1 ratio.
Subtotal wetland impacts associated with road and bridge improvement	**4.5999**	Habitat-based mitigation of 16.98 acres
Wetland impacts associated with JPA mitigation site		
Disturbed southern willow scrub	Remove 0.07 ac	Habitat-based mitigation at 1:1 ratio.
Alkali marsh	Remove 0.48 ac	Habitat-based mitigation at 1:1 ratio.
Tamarisk scrub	Remove 1.22	Habitat-based mitigation at 1:1 ratio.
Tamarisk scrub (berm)	Remove 0.11	Habitat-based mitigation at 2:1 ratio.
Disturbed wetland	Remove 0.23 ac	Habitat-based mitigation at 1:1 ratio.
Subtotal wetland impacts associated with JPA mitigation site	**2.11ac**	Habitat-based mitigation of 2.22 acres
Total wetland impacts	**6.71**	Habitat-based mitigation of 19.20 acres
Upland impacts associated with road and bridge improvement		
Disturbed Diegan coastal sage scrub – coastal form	Remove: 0.515 ac	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – coastal form[1]	Remove: 0.038 ac	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – Baccharis dominated	Remove: 0.21ac	Habitat-based mitigation at 1:1 ratio.
Subtotal upland impacts associated with road and bridge improvement	**0.763 ac**	Habitat-based mitigation 0f 763 ac
Upland impacts associated with JPA mitigation site		
Disturbed Diegan coastal sage scrub – coastal form (berm)	Remove 0.03	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – Baccharis dominated (berm)	Remove 1.13 ac	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – Baccharis dominated	Remove 13.17	Habitat-based mitigation at 1:1 ratio.
Non-native grassland	Remove 0.04 ac	Habitat-based mitigation at 1:1 ratio.
Subtotal upland impacts associated with JPA mitigation site	**14.37 ac**	Habitat-based mitigation of 14.33 ac
Total upland impacts	**15.133 ac**	Habitat-based mitigation of 15.093 ac
Impacts to jurisdictional habitats associated with road and bridge improvement		
USACE Jurisdictional areas	Permanent: 3.69 ac Temporary: 0.94 ac	Permits/approvals will be required.
CDFW Jurisdictional areas	Permanent: 3.67 ac Temporary: 0.93 ac	Permits/approvals will be required

Table S-3, continued

Biological Resource	Impact	Mitigation Measure
Impacts to jurisdictional habitats associated with JPA mitigation site		
CDFW Jurisdictional areas	Permanent: 0.11 ac Temporary: 2.0	Permits/approvals will be required.
Total impacts to jurisdictional habitats		
USACE Jurisdictional areas	Permanent: 3.69 ac Temporary: 0.94 ac	Permits/approvals will be required.
CDFW Jurisdictional areas	Permanent: 3.67 ac Temporary: 0.93 ac	Permits/approvals will be required
Impacts to sensitive species associated with road and bridge improvement		
Palmer's sagewort (*Artemisia palmeri*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove 4 individuals	Palmer's sagewort to be included in plant palette used for southern willow scrub/mule-fat scrub enhancement and creation in the JPA mitigation area.
Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) Occurs in disturbed and undisturbed coastal freshwater marsh and disturbed southern willow scrub	Remove 2 individuals	Southwestern spiny rush to be included in plant palette used for freshwater marsh in the JPA mitigation area.
Clark's marsh wren (*Cistothorus palustris clarkae*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season.
Light-footed clapper rail (*Rallus longirostris levipes*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season. Additional measures will be implemented to minimize indirect impacts from construction during the non-breeding season
Least Bell's vireo (*Vireo bellii pusillus*) Occurs in disturbed mule-fat scrub, disturbed southern willow scrub.	Remove occupied habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur outside of the breeding season.
Nesting Birds and Raptors May occur throughout the BSA.	Remove suitable nesting habitat	Removal of vegetation will occur during the non-breeding season or would be allowed during the breeding season if a nesting bird and raptor survey is conducted and has negative findings or if suitable buffers are placed around the active nest and no construction activities occur within the buffer until the nest is no longer active.
Impacts to sensitive species associated with JPA mitigation site		
San Diego marsh-elder (*Iva hayesiana*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove 6 individuals	San Diego marsh-elder to be included in plant palette used for marsh creation in the JPA mitigation area.

Table S-3, continued

Biological Resource	Impact	Mitigation Measure
Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) Occurs in disturbed and undisturbed coastal freshwater marsh and disturbed southern willow scrub.	Remove 1 individual	Southwestern spiny rush to be included in plant palette used for marsh creation in the JPA mitigation area. No mitigation required.
Northern harrier (*Circus cyaneus*) Occurs throughout the BSA.	Remove occupied habitat	Removal of vegetation will occur during the non-breeding season. Create/enhance occupied habitat.
Yellow warbler (*Dendroica petechia*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove suitable habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur during the non-breeding season.
White-tailed kite (*Elanus leucurus*) Occurs in disturbed diegan coastal sage scrub -*Baccharis* dominated.	Remove occupied habitat	Removal of vegetation will occur during the non-breeding season. Create/enhance occupied habitat.
Light-footed clapper rail (*Rallus longirostris levipes*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season. Additional mitigation measures will be implemented to minimize indirect impacts from construction during the non-breeding season
Least Bell's vireo (*Vireo bellii pusillus*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove occupied habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur during the non-breeding season.
Nesting Birds and Raptors May occur throughout the BSA.	Remove suitable nesting habitat	Removal of vegetation will occur during the non-breeding season or would be allowed during the breeding season if a nesting bird and raptor survey is conducted and has negative findings or if suitable buffers are placed around the active nest and no construction activities occur within the buffer until the nest is no longer active.
[1]Within Fairbanks Mitigation Site		

Eastern Alignment Alternative. Road and bridge improvement activities associated with the Eastern Alignment Alternative will result in a total of 4.5791 ac of impacts to wetland habitats requiring 17.496 ac of mitigation (Table S-4). Impacts include 0.12 ac of disturbed southern willow scrub, 0.222 ac of mule-fat scrub, 0.068 ac of mule-fat scrub within the Fairbanks Mitigation Site, 0.25 ac of disturbed mule-fat scrub, 1.1881 ac of coastal freshwater marsh, 0.004 ac of coastal freshwater marsh within the Fairbanks Mitigation Site, 0.384 ac of disturbed coastal freshwater marsh, 2.27 ac of disturbed southern coastal salt marsh, 0.003 ac of tamarisk scrub and 0.07 ac of disturbed wetland. Road and bridge improvement activities will impact a total of 0.4392 ac of sensitive upland habitats, including 0.402 ac of disturbed Diegan coastal sage scrub – coastal form, 0.037 ac of disturbed Diegan coastal sage scrub – coastal form within the Fairbanks Mitigation Site and 0.0002 ac of disturbed Diegan coastal sage scrub – Baccharis dominated.

JPA Mitigation Site. Impacts to wetland and sensitive upland habitats associated with the implementation of mitigation measures at the JPA site are identical to those presented for the Western Alignment and are not repeated here. These impacts and mitigation measures are summarized below in Table S-4.

Impacts to all wetland habitats will be mitigated at the 21.88 ac JPA mitigation site. There are 20.4 ac available for mitigation once the 1.48 ac protective berm is constructed. Mitigation for the berm will be accomplished through purchase of credits from the City's Cornerstone Lands with 1:1 mitigation for 1.16 ac of impact to disturbed Diegan coastal sage scrub, conversion of 0.22 ac of wetlands on-site as mitigation for impacts to 0.1 ac of tamarisk scrub.

Mitigation for the Eastern Alignment Alternative. Impacts to 0.73 ac of combined disturbed southern willow scrub, disturbed mule-fat scrub, tamarisk scrub and disturbed wetland will be mitigated at 3:1 and 2:1 ratios at the 3 ac mule-fat scrub/southern willow scrub creation component, exceeding mitigation requirement by 0.88 ac creation. An additional 2 ac of mule-fat scrub/southern willow scrub enhancement is proposed in exceedance of City requirements. The additional acreage is proposed to partially offset temporal impacts to light-footed clapper rails during construction. These habitats serve as foraging/refugia for clapper rails.

Impacts to 1.5721 ac of disturbed and undisturbed coastal freshwater marsh and 2.27 ac of disturbed southern coastal salt marsh will be mitigated at a 4:1 ratio through the creation of 15.3684 ac of coastal freshwater marsh at the 15.4 ac freshwater marsh creation component, exceeding City requirements by 0.0316 ac.

Total mitigation for impacts to wetland habitats associated with construction of the Eastern Alignment Alternative equals 19.7144 ac exceeding City requirements by 0.6856 ac.

Impacts to sensitive upland habitats, including 0.4392 ac of disturbed Diegan coastal sage scrub associated with road and bridge improvement, the remaining 13.17 ac disturbed Diegan coastal sage scrub associated with the JPA mitigation site, and 0.04 ac non-native grassland associated with the mitigation site, will be mitigated through purchase of credits from the City's Cornerstone Lands.

The Eastern Alignment Alternative will result in permanent impacts to 2.64 ac and temporary impacts to 1.65 ac of USACE jurisdictional areas. This includes permanent impacts to 0.99

ac and temporary impacts to 1.09 ac of wetland waters of the U.S., permanent impacts to 1.64 ac and temporary impacts to 0.55 ac of adjacent wetlands, and permanent impacts to 0.01 ac and temporary impacts to 0.01 ac of non-wetland waters of the U.S.

The Eastern Alignment Alternative will also result in permanent impacts to 2.84 ac and temporary impacts to 1.73 ac of CDFW jurisdictional areas. This includes 0.99 ac of permanent impacts and 1.10 ac of temporary impacts to CDFW state streambed, and 1.85 ac of permanent impacts and 0.63 ac of temporary impacts to CDFW riparian habitat.

Impacts to jurisdictional habitats associated with the JPA mitigation site include permanent impacts to 0.11 ac of CDFW jurisdictional area associated with the berm (tamarisk scrub) and 2.0 ac temporary impacts to CDFW jurisdictional areas associated with mitigation activities. There are no impacts to USACE or RWQCB jurisdictional areas associated with the JPA mitigation site.

The Eastern Alignment Alternative would also result in impacts to 41 individuals of southwestern spiny rush. Southwestern spiny rush would be included in the plant palette used in the creation and enhancement of southern willow scrub/mule-fat scrub in the JPA mitigation area as mitigation for impacts to individuals of this species. Final success criteria for the JPA mitigation area will require the presence of southwestern spiny rush prior to final site signoff. This alternative will also impact occupied habitat for Clark's marsh wren, yellow-breasted chat (*Icteria virens*), light-footed clapper rail, and least Bell's vireo. Habitat-based mitigation will occur at mitigation ratios established by the City in the Biology Guidelines (City of San Diego 2002), including 4:1 for Clark's marsh wren habitat, 3:1 for yellow-breasted chat habitat, 4:1 for light-footed clapper rail habitat, and 3:1 for least Bell's vireo habitat.

Additional measures have been incorporated in all alternatives to minimize the impacts from construction activities to least Bell's vireo and light-footed clapper rail. These are presented in detail in Chapter 4 and are summarized in the description of the Western Alignment Alternative.

Table S-4. Eastern Alignment Alternative—Summary of Impacts and Associated Mitigation Measures

Biological Resource	Impact	Mitigation Measure
Wetland impacts associated with road and bridge improvement		
Disturbed southern willow scrub	Remove: 0.12 ac	Habitat-based mitigation at 3:1 ratio.
Mule-fat scrub	Remove: 0.222 ac	Habitat-based mitigation at 3:1 ratio.
Mule-fat scrub [1]	Remove: 0.068 ac	Habitat-based mitigation at 3:1 ratio.
Disturbed Mule-fat scrub	Remove: 0.25 ac	Habitat-based mitigation at 3:1 ratio.
Coastal freshwater marsh	Remove: 1.1881 ac	Habitat-based mitigation at 4:1 ratio.
Coastal freshwater marsh [1]	Remove: 0.004 ac	Habitat-based mitigation at 4:1 ratio.
Disturbed coastal freshwater marsh	Remove: 0.384 ac	Habitat-based mitigation at 4:1 ratio.
Disturbed southern coastal salt marsh	Remove: 2.27 ac	Habitat-based mitigation at 4:1 ratio.

Table S-4, continued

Biological Resource	Impact	Mitigation Measure
Disturbed wetland	Remove: 0.07 ac	Habitat-based mitigation at 2:1 ratio.
Tamarisk scrub	Remove 0.003 ac	Habitat-based mitigation at 2:1 ratio
Subtotal wetland impacts associated with road and bridge improvement	**4.5791**	Habitat-based mitigation of 17.496 ac
Wetland impacts associated with JPA mitigation site		
Disturbed southern willow scrub	Remove 0.07 ac	Habitat-based mitigation at 1:1 ratio.
Alkali marsh	Remove 0.48 ac	Habitat-based mitigation at 1:1 ratio.
Tamarisk scrub	Remove 1.22	Habitat-based mitigation at 1:1 ratio.
Tamarisk scrub (berm)	Remove 0.11	Habitat-based mitigation at 1:1 ratio.
Disturbed wetland	Remove 0.23 ac	Habitat-based mitigation at 1:1 ratio.
Subtotal wetland impacts associated with JPA mitigation site	**2.11 ac**	Habitat-based mitigation of 2.22 ac
Total wetland impacts	**6.6891**	Habitat-based mitigation at 19.7144 ac
Upland impacts associated with road and bridge improvement		
Disturbed Diegan coastal sage scrub – coastal form	Remove: 0.402 ac	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – coastal form[1]	Remove: 0.037 ac	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – Baccharis dominated	Remove: 0.0002ac	Habitat-based mitigation at 1:1 ratio.
Subtotal upland impacts associated with road and bridge improvement	**0.4392 ac**	Habitat-based mitigation of 0.4392 ac
Upland impacts associated with JPA mitigation site		
Disturbed Diegan coastal sage scrub – coastal form (berm)	Remove 0.03	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – Baccharis dominated	Remover1.13 ac	Habitat-based mitigation at 1:1 ratio
Disturbed Diegan coastal sage scrub – Baccharis dominated	Remove 13.17 ac	Habitat-based mitigation at 1:1 ratio.
Non-native grassland	Remove 0.04 ac	Habitat-based mitigation at 1:1 ratio
Subtotal upland impacts associated with JPA mitigation site	**14.37 ac**	Habitat-based mitigation of 14.33 ac
Total upland impacts	**14.8072ac**	Habitat-based mitigation 14.8072 ac
Impacts to jurisdictional habitats associated with road and bridge improvement		
USACE Jurisdictional areas	Permanent: 2.64 ac Temporary: 1.65 ac	Permits/approvals will be required.
CDFW Jurisdictional areas	Permanent: 2.84 ac Temporary: 1.73 ac	Permits/approvals will be required
Impacts to jurisdictional habitats associated with JPA mitigation site		
CDFW Jurisdictional areas	Permanent: 0.11 ac Temporary: 2.0 ac	Permits/approvals will be required.
Total impacts to jurisdictional habitats		
USACE Jurisdictional areas	Permanent: 2.64 ac Temporary: 1.65ac	Permits/approvals will be required.
CDFW Jurisdictional areas	Permanent: 2.94 ac Temporary: 3.73 ac	Permits/approvals will be required

Table S-4, continued

Biological Resource	Impact	Mitigation Measure
Impacts to sensitive species associated with road and bridge improvement		
Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) Occurs in disturbed and undisturbed coastal freshwater marsh and disturbed southern willow scrub	Remove 41 individuals	Southwestern spiny rush to be included in plant palette used for freshwater marsh in the JPA mitigation area.
Clark's marsh wren (*Cistothorus palustris clarkae*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season.
Yellow-breasted chat (*Icteria virens*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove occupied habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur outside of the breeding season.
Light-footed clapper rail (*Rallus longirostris levipes*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season. Additional measures will be implemented to minimize indirect impacts from construction during the non-breeding season
Least Bell's vireo (*Vireo bellii pusillus*) Occurs in disturbed mule-fat scrub, disturbed southern willow scrub.	Remove occupied habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur outside of the breeding season.
Nesting Birds and Raptors May occur throughout the BSA.	Remove suitable nesting habitat	Removal of vegetation will occur during the non-breeding season or would be allowed during the breeding season if a nesting bird and raptor survey is conducted and has negative findings or if suitable buffers are placed around the active nest and no construction activities occur within the buffer until the nest is no longer active.
Impacts to sensitive species associated with JPA mitigation site		
San Diego marsh-elder (*Iva hayesiana*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove 6 individuals	San Diego marsh-elder to be included in plant palette used for marsh creation in the JPA mitigation area.
Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) Occurs in disturbed and undisturbed coastal freshwater marsh and disturbed southern willow scrub.	Remove 1 individual	Southwestern spiny rush to be included in plant palette used for marsh creation in the JPA mitigation area. No mitigation required.
Northern harrier (*Circus cyaneus*) Occurs throughout the BSA.	Remove occupied habitat	Removal of vegetation will occur during the non-breeding season. Create/enhance occupied habitat.
Yellow warbler (*Dendroica petechia*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove suitable habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur during the non-breeding season.

Table S-4, continued

Biological Resource	Impact	Mitigation Measure
White-tailed kite (*Elanus leucurus*) Occurs in disturbed diegan coastal sage scrub -*Baccharis* dominated.	Remove occupied habitat	Removal of vegetation will occur during the non-breeding season. Create/enhance occupied habitat.
Light-footed clapper rail (*Rallus longirostris levipes*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season. Additional mitigation measures will be implemented to minimize indirect impacts from construction during the non-breeding season
Least Bell's vireo (*Vireo bellii pusillus*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove occupied habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur during the non-breeding season.
Nesting Birds and Raptors May occur throughout the BSA.	Remove suitable nesting habitat	Removal of vegetation will occur during the non-breeding season or would be allowed during the breeding season if a nesting bird and raptor survey is conducted and has negative findings or if suitable buffers are placed around the active nest and no construction activities occur within the buffer until the nest is no longer active.
[1]Within Fairbanks Mitigation Site		

Roundabout Alignment Alternative. Road and bridge improvement activities associated with the Roundabout Alignment Alternative will result in impacts to a total of 6.4353 ac of wetland habitats requiring 24.6672 ac of mitigation. Impacts include 0.31 ac of disturbed southern willow scrub, 0.22 ac of mule-fat scrub, 0.068 ac of mule-fat scrub within the Fairbanks Mitigation Site, 0.25 ac of disturbed mule-fat scrub, 1.27 ac of coastal freshwater marsh, 0.0041 ac of coastal freshwater marsh within the Fairbanks Mitigation Site, 0.38 ac of disturbed coastal freshwater marsh, 3.79 ac of disturbed southern coastal salt marsh, 0.11 ac of disturbed wetland, 0.003 ac of tamarisk scrub, and 0.0302 ac of alkali marsh. Road and bridge improvement activities will impact a total of 0.787 ac of sensitive upland habitats including 0.69 ac of disturbed Diegan coastal sage scrub – coastal form, 0.037 ac of disturbed Diegan coastal sage scrub - coastal form within the Fairbanks Mitigation Site and 0.06 ac of disturbed Diegan coastal sage scrub – Baccharis dominated.

JPA Mitigation Site. Impacts to wetland and sensitive upland habitats associated with the implementation of mitigation measures at the JPA site are identical to those presented for the Western Alignment and are not repeated here. These impacts and mitigation measures are summarized below in Table S-5.

Mitigation for the Roundabout Alignment Alternative. Mitigation for impacts to 6.4353 ac of wetland impacts from road and bridge improvement at City ratios requires creation of 24.6672 ac of wetland habitat. This exceeds the capacity of the proposed JPA mitigation area. An additional 2.11 ac of wetland habitat will be impacted at the JPA site for a total wetland mitigation burden of 26.8872 ac. The Roundabout Alternative would require an additional 6.48 acres of wetland mitigation beyond the JPA mitigation site. The City of San Diego owns a parcel in Gonzales Canyon immediately south of the JPA site and south of El Camino Real that is considered suitable for mitigation, through a combination of creation and enhancement on up to 10.8 acres. A Memorandum of Understanding is in process should it become necessary to proceed with this additional mitigation. Details on this additional wetland creation and enhancement are presented in Chapter 4. Impacts to sensitive upland habitats, including 0.787 ac of disturbed Diegan coastal sage scrub associated with road and bridge improvement and 14.33 ac disturbed Diegan coastal sage scrub habitats associated with the JPA mitigation site, will be mitigated through purchase of credits from the City's Cornerstone Lands.

The Roundabout Alignment Alternative will result in permanent impacts to 4.23 ac and temporary impacts to 1.84 ac of USACE and RWQCB jurisdictional areas. This includes permanent impacts to 1.11 ac and temporary impacts to 1.15 ac of wetland waters of the U.S., permanent impacts to 3.11 ac and temporary impacts to 0.68 ac of adjacent wetlands, and permanent impacts to 0.01 ac and temporary impacts to 0.01 ac of non-wetland waters of the U.S.

The Roundabout Alignment Alternative will also result in permanent impacts to 4.63 ac and temporary impacts to 1.81 ac of CDFW jurisdictional areas. This includes 1.11 ac of permanent impacts and 1.13 ac of temporary impacts to CDFW state streambed, and 3.52 ac of permanent impacts and 0.68 ac of temporary impacts to CDFW riparian habitat.

Impacts to jurisdictional habitats associated with the JPA mitigation site include permanent impacts to 0.11 ac of CDFW jurisdictional area associated with the berm (tamarisk scrub) and 2.0 ac temporary impacts to CDFW jurisdictional areas associated with mitigation activities. There are no impacts to USACE or RWQCB jurisdictional areas associated with the JPA mitigation site.

The Roundabout Alignment Alternative will also result in impacts to 16 individuals and a 0.03-ac area of San Diego sunflower (*Bahiopsis laciniata*) and 41 individuals of southwestern spiny rush. Habitat-based mitigation would be provided for impacts to San Diego sunflower at a 1:1 ratio. Southwestern spiny rush would be included in the plant palette used in the creation and enhancement of southern willow scrub/mule-fat scrub in the JPA mitigation area as mitigation for impacts to individuals of this species. Final success criteria for the JPA mitigation area will require the presence of southwestern spiny rush prior to final site signoff. This alternative will also result in impacts to occupied habitat for Clark's marsh wren, yellow-breasted chat, light-footed clapper rail, and least Bell's vireo. Habitat-based mitigation will occur at mitigation ratios established by the City in the Biology Guidelines (City of San Diego 2002), including 4:1 for Clark's marsh wren habitat, 3:1 for yellow-breasted chat habitat, 4:1 for light-footed clapper rail habitat, and 3:1 for least Bell's vireo habitat.

Additional measures have been incorporated in all alternatives to minimize the impacts from construction activities to least Bell's vireo and light-footed clapper rail. These are presented in detail in Chapter 4 and have been summarized in the description of the western alignment.

Table S-5. Roundabout Alignment Alternative—Summary of Impacts and Associated Mitigation Measures

Biological Resource	Impact	Mitigation Measure
Wetland impacts associated with road and bridge improvement		
Disturbed southern willow scrub	Remove: 0.31 ac	Habitat-based mitigation at 3:1 ratio.
Mule-fat scrub	Remove: 0.22 ac	Habitat-based mitigation at 3:1 ratio.
Mule-fat scrub [1]	Remove: 0.068 ac	Habitat-based mitigation at 3:1 ratio.
Disturbed Mule-fat scrub	Remove: 0.25 ac	Habitat-based mitigation at 3:1 ratio.
Tamarisk scrub	Remove: 0.003 ac	Habitat-based mitigation at 2:1 ratio.
Coastal freshwater marsh	Remove: 1.27 ac	Habitat-based mitigation at 4:1 ratio.
Coastal freshwater marsh[1]	Remove: 0.0041 ac	Habitat-based mitigation at 4:1 ratio.
Disturbed coastal freshwater marsh	Remove: 0.38 ac	Habitat-based mitigation at 4:1 ratio.
Disturbed southern coastal salt marsh	Remove: 3.79 ac	Habitat-based mitigation at 4:1 ratio.
Disturbed wetland	Remove: 0.11 ac	Habitat-based mitigation at 2:1 ratio.
Alkali marsh	Remove 0.0302 ac	Habitat-based mitigation at 4:1 ratio.
Subtotal wetland impacts associated with road and bridge improvement	**6.4353**	Habitat-based mitigation of 24.6672 ac
Wetland impacts associated with JPA mitigation site		
Disturbed southern willow scrub	Remove 0.07 ac	Habitat-based mitigation at 1:1 ratio.
Alkali marsh	Remove 0.48 ac	Habitat-based mitigation at 1:1 ratio.
Tamarisk scrub	Remove 1.22	Habitat-based mitigation at 1:1 ratio.
Tamarisk scrub - berm	Remove 0.11	Habitat-based mitigation at 2:1 ratio.
Disturbed wetland	Remove 0.23 ac	Habitat-based mitigation at 1:1 ratio.
Subtotal wetland impacts associated with JPA mitigation site	**2.11 ac**	Habitat-based mitigation of 2.22 ac
Total wetland impacts	**8.4081**	Habitat-based mitigation of no less than 26.8872 ac and up to 31.2 ac
Upland impacts associated with road and bridge improvement		
Disturbed Diegan coastal sage scrub – coastal form	Remove: 0.69 ac	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – coastal form[1]	Remove: 0.037 ac	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – Baccharis dominated	Remove: 0.06ac	Habitat-based mitigation at 1:1 ratio.
Subtotal upland impacts associated with road and bridge improvement	**0.787 ac**	Habitat-based mitigation of 0.787 ac

Table S-5, continued

Biological Resource	Impact	Mitigation Measure
Upland impacts associated with JPA mitigation site		
Disturbed Diegan coastal sage scrub – coastal form (berm)	Remove 0.03	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – Baccharis dominated (berm)	Remove 1.13	Habitat-based mitigation at 1:1 ratio.
Disturbed Diegan coastal sage scrub – Baccharis dominated	Remove 13.17 ac	Habitat-based mitigation at 1:1 ratio.
Non-native grassland	Remove 0.04 ac	Habitat-based mitigation at 1:1 ratio.
Subtotal upland impacts associated with JPA mitigation site	**14.37 ac**	Habitat-based mitigation of 14.33 ac
Total upland impacts	**15.157 ac**	Habitat-based mitigation of 15.157 ac
Impacts to jurisdictional habitats associated with road and bridge improvement		
USACE Jurisdictional areas	Permanent: 4.23 ac Temporary: 1.84 ac	Permits/approvals will be required.
CDFW Jurisdictional areas	Permanent: 4.63 ac Temporary: 1.81 ac	Permits/approvals will be required
Impacts to jurisdictional habitats associated with JPA mitigation site		
CDFW Jurisdictional areas	Permanent: 0.11 ac Temporary: 2.0	Permits/approvals will be required.
Total impacts to jurisdictional habitats		
USACE Jurisdictional areas	Permanent: 4.23 ac Temporary: 1.84 ac	Permits/approvals will be required.
CDFW Jurisdictional areas	Permanent: 4.66 ac Temporary: 3.94 ac	Permits/approvals will be required
Impacts to sensitive species associated with road and bridge improvement		
San Diego sunflower (*Bahiopsis laciniata*) Occurs in disturbed coastal sage scrub	Remove 16 individuals	Habitat-based mitigation at 1:1
Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) Occurs in disturbed and undisturbed coastal freshwater marsh and disturbed southern willow scrub	Remove 41 individuals	Southwestern spiny rush to be included in plant palette used for freshwater marsh in the JPA mitigation area.
Clark's marsh wren (*Cistothorus palustris clarkae*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season.
Yellow-breasted chat (*Icteria virens*) Occurs in disturbed mule-fat scrub, disturbed southern willow scrub.	Remove occupied habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur during the non-breeding season.
Light-footed clapper rail (*Rallus longirostris levipes*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season. Additional measures will be implemented to minimize indirect impacts from construction during the non-breeding season

Table S-5, continued

Biological Resource	Impact	Mitigation Measure
Least Bell's vireo (*Vireo bellii pusillus*) Occurs in disturbed mule-fat scrub, disturbed southern willow scrub.	Remove occupied habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur outside of the breeding season.
Nesting Birds and Raptors May occur throughout the BSA.	Remove suitable nesting habitat	Removal of vegetation will occur during the non-breeding season or would be allowed during the breeding season if a nesting bird and raptor survey is conducted and has negative findings or if suitable buffers are placed around the active nest and no construction activities occur within the buffer until the nest is no longer active.
Impacts to sensitive species associated with JPA mitigation site		
San Diego marsh-elder (*Iva hayesiana*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove 6 individuals	San Diego marsh-elder to be included in plant palette used for marsh creation in the JPA mitigation area.
Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) Occurs in disturbed and undisturbed coastal freshwater marsh and disturbed southern willow scrub.	Remove 1 individual	Southwestern spiny rush to be included in plant palette used for marsh creation in the JPA mitigation area. No mitigation required.
Northern harrier (*Circus cyaneus*) Occurs throughout the BSA.	Remove occupied habitat	Removal of vegetation will occur during the non-breeding season. Create/enhance occupied habitat.
Yellow warbler (*Dendroica petechia*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove suitable habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur during the non-breeding season.
White-tailed kite (*Elanus leucurus*) Occurs in disturbed diegan coastal sage scrub -*Baccharis* dominated.	Remove occupied habitat	Removal of vegetation will occur during the non-breeding season. Create/enhance occupied habitat.
Light-footed clapper rail (*Rallus longirostris levipes*) Occurs in disturbed and undisturbed coastal freshwater marsh.	Remove occupied habitat	Habitat-based mitigation at 4:1 ratio. Removal of vegetation will occur during the non-breeding season. Additional mitigation measures will be implemented to minimize indirect impacts from construction during the non-breeding season
Least Bell's vireo (*Vireo bellii pusillus*) Occurs in disturbed mule-fat scrub and disturbed southern willow scrub.	Remove occupied habitat	Habitat-based mitigation at 3:1 ratio. Removal of vegetation will occur during the non-breeding season.

Table S-5, continued

Biological Resource	Impact	Mitigation Measure
Nesting Birds and Raptors May occur throughout the BSA.	Remove suitable nesting habitat	Removal of vegetation will occur during the non-breeding season or would be allowed during the breeding season if a nesting bird and raptor survey is conducted and has negative findings or if suitable buffers are placed around the active nest and no construction activities occur within the buffer until the nest is no longer active.
[1]Within Fairbanks Mitigation Site		

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List of Abbreviated Terms and Selected Definitions

ac	acre
AM	Alkali marsh
BFE	Base Flood Elevation
BMP	Best Management Practice
BSA	Biological Study Area(Combined footprint of all alternative road and bridge alignments)
Cal-IPC	California Invasive Plant Council
CALTRANS	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality (Federal entity responsible for development of environmental policies and initiatives pursuant to NEPA).
CCC	California Coastal Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFM	Coastal freshwater marsh
CFP	State Fully Protected
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CIDH	Cast In Drilled Holes
City	City of San Diego
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CWA	Clean Water Act
DCFM	Disturbed coastal freshwater marsh
decibels	dB
DMFS	Disturbed mule-fat scrub
DSWS	Disturbed southern willow scrub
DW	Disturbed wetland
L_{eq}	equivalent continuous sound pressure level
FAC	facultative
FACW	facultative wetland
FE	Federally endangered
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FPA	Focused Planning Area
fps	Feet per Second
ft	Feet
GIS	geographic information system
GPS	Global Positioning System
HEC-RAS	HEC River Analysis System
I-15	Interstate 15
I-5	Interstate 5

ICF	ICF International
in	Inch
JPA	Joint Powers Authority
LEDPA	Least Environmentally Damaging Practicable Alternative
LOS	Level of Service
m	meters
MBTA	Migratory Bird Treaty Act
MHPA	Multi-Habitat Preserve Area
MSCP	Multiple Species Conservation Program
MSL	mean sea level
NCFUA	North City Future Urbanizing Area
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NGVD	National Geodetic Vertical Datum
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
OBL	obligate
OHWM	ordinary high water mark
Project	El Camino Real Bridge Replacement Project
RCP	Reinforced Concrete Pipe
RPW	Relatively Permanent Water
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SDG&E	San Diego Gas & Electric
SE	State endangered
sq. ft.	Square Foot
SSC	California Species of Special Concern
Tierra	Tierra Environmental Services
TNW	Traditional Navigable Water
TS	Tamarisk scrub
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WSE	Water Surface Elevation
WSEL	Water Surface Elevation Level

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Chapter 1. Introduction

The El Camino Real Bridge Replacement Project (Project) is located in the City of San Diego, in San Diego County, California. The site is located approximately 1.25 miles east of Interstate 5 (I-5). It is accessible from the east and west from Via de la Valle and from the south from Del Mar Heights Road. The Project involves widening a segment of El Camino Real extending from Via de la Valle to San Dieguito Road and the replacement of the bridge that crosses over the San Dieguito River (Figures 1 and 2). The El Camino Real Bridge crosses over the San Dieguito River approximately 0.3 mile south of the intersection of Via de la Valle and El Camino Real. The Project site is located on the U.S. Geological Survey (USGS) Del Mar Quadrangle, Sections 6 & 7, Township 14 South, and Range 3 West.

This Natural Environment Study (NES) for the Project has been prepared pursuant to the California Department of Transportation's (CALTRANS) guidelines. This NES describes the existing biological environment and how the Project may affect that environment. The NES is also intended to meet City of San Diego requirements pursuant to the City of San Diego Land Development Code, Biology Guidelines (City of San Diego 2002). The 2002 guidelines are appropriate as the project has been deemed "substantially complete" by the City based on earlier versions of this NES. The NES contains the technical analysis that lends support to environmental documentation concerning plants, wildlife, and natural communities that may be affected by the Project. This NES also includes an analysis of a parcel owned by the San Dieguito River Park Joint Powers Authority (JPA), formerly the Boudreau property, which is the proposed mitigation site for the Project. A portion of proposed mitigation site for the constructed Fairbanks Ranch Project also occurs within the BSA. The Fairbanks Ranch mitigation plan included enhancement and restoration of riparian scrub habitat along the north and south banks of the San Dieguito River from approximately the El Camino Real Bridge northeast approximately 5,000 feet (ft) to the southern end of Morgan Run Golf Corse. This mitigation plan was never implemented, an issue that remains unresolved.

1.1. Project History

The road being modified is the segment of El Camino Real that extends from Via de la Valle to San Dieguito Road. This portion of El Camino Real, classified as a two-lane collector, is approximately 2,400 ft long, 23 ft wide, has one travel lane in each direction, and has no shoulders, bike lanes, or pedestrian walkways. The road segment includes a bridge over the San Dieguito River that was built in 1940 and has been deemed seismically inadequate by the Federal Highway Administration (FHWA). The existing bridge is 340 ft long and 27 ft wide (24 ft wide curb to curb on the concrete travel surface, with 1.5-ft-wide raised concrete curbs on each side). The top of the bridge is deck is approximately 20 ft high relative to the bottom of the San Dieguito River channel (bridge deck at approximately +25 ft mean sea level [MSL]; channel at approximately +5 ft MSL) which not high enough to accommodate the 100-year flood. The City of San Diego (City) proposes to modify this segment of El Camino Real and replace the bridge in order to improve the structural integrity of the bridge over the San Dieguito River, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, relieve traffic congestion, and improve consistency with the adopted land use plan in the Project area.

The affected portion of El Camino Real is situated within the northwestern part of the North City Future Urbanizing Area (NCFUA), a diverse planning area that extends from I-5 on the west to Interstate 15 (I-15) on the east, and from Los Peñasquitos Canyon on the south to Santa Fe Valley on the north. The NCFUA Framework Plan (City of San Diego 1995) was initially adopted by the City Council in 1992 as an amendment to the General Plan in effect at that time. The Framework Plan includes guiding principles, which are broad goal or policy statements to be used in evaluating future planning efforts in the NCFUA. The Framework Plan also contains implementing principles, which are more specific standards or criteria intended to implement the guiding principles. The implementing principles may be supplanted by zoning after new zones have been applied to the NCFUA. City zoning and the Framework Plan are the governing land use documents for the Project area.

The Framework Plan designates El Camino Real as a four-lane Major Arterial with a Level of Service (LOS) of B. However, El Camino Real is currently a two-lane collector operating at LOS F. Therefore, the Project proposes modifications to improve compatibility with the approved planning documents for the area in terms of road classification and LOS. El Camino Real is identified on the 2008 City of San Diego General Plan Land Use and Street System Map.

In 2006, an NES was prepared by Tierra Environmental Services (Tierra). That NES addressed the central, western, and Eastern Alignment Alternatives, in addition to a lower elevation alternative, a road capacity alternative, and a bicycle safety alternative. In 2009, the City requested that biological studies be updated for this Project due to the 3-year lapse since the last studies had been performed. This is addressed in Section 2.2. After the biological studies were updated in 2009, the Project was put on hold in order to redesign the proposed alternatives. The redesign of the alternatives was completed in 2011.

1.2. Project Description

Four different alternatives have been analyzed (Figure 3):

- Central Alignment Alternative,

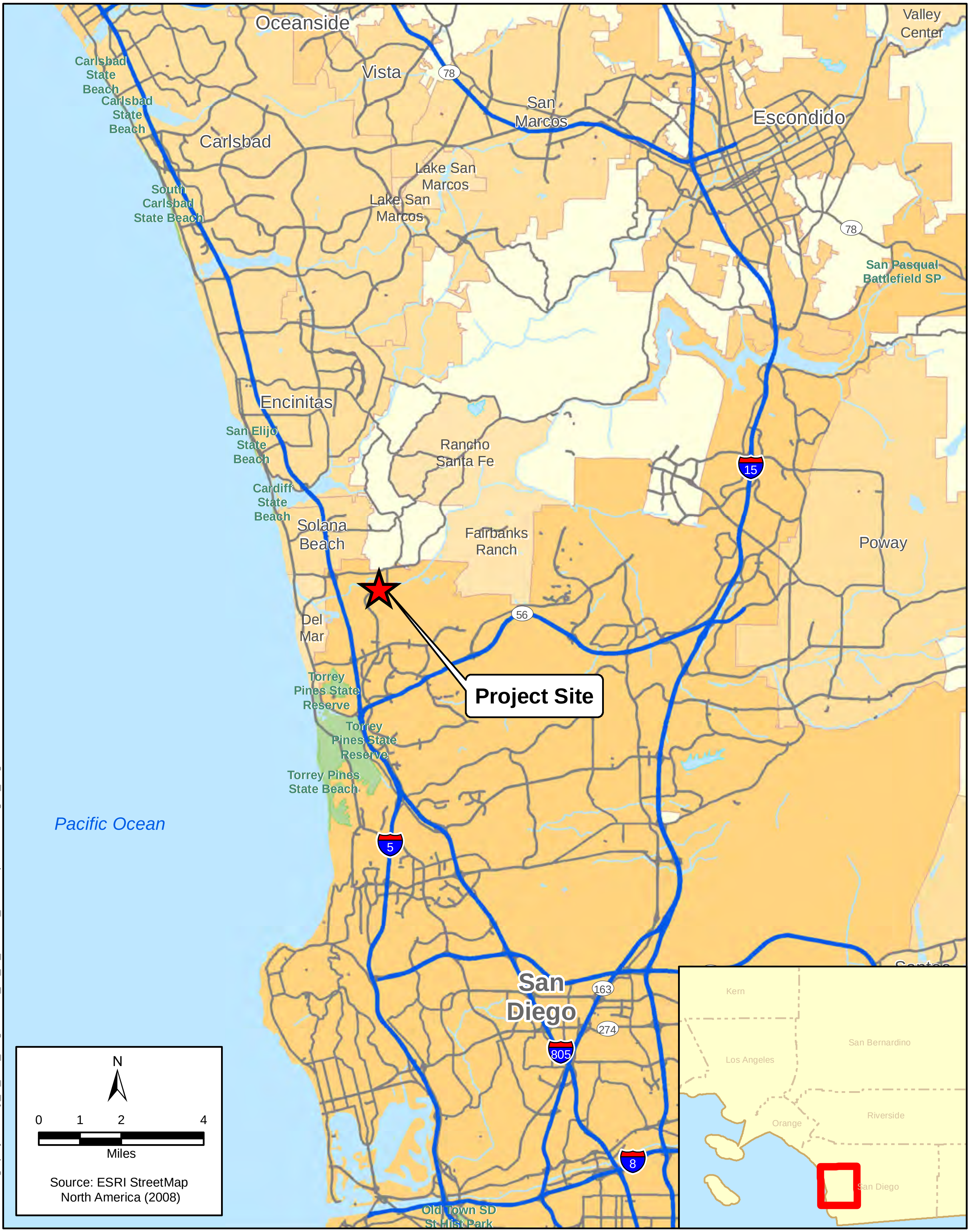

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Figure 1
Regional Vicinity
El Camino Real Bridge Replacement Project

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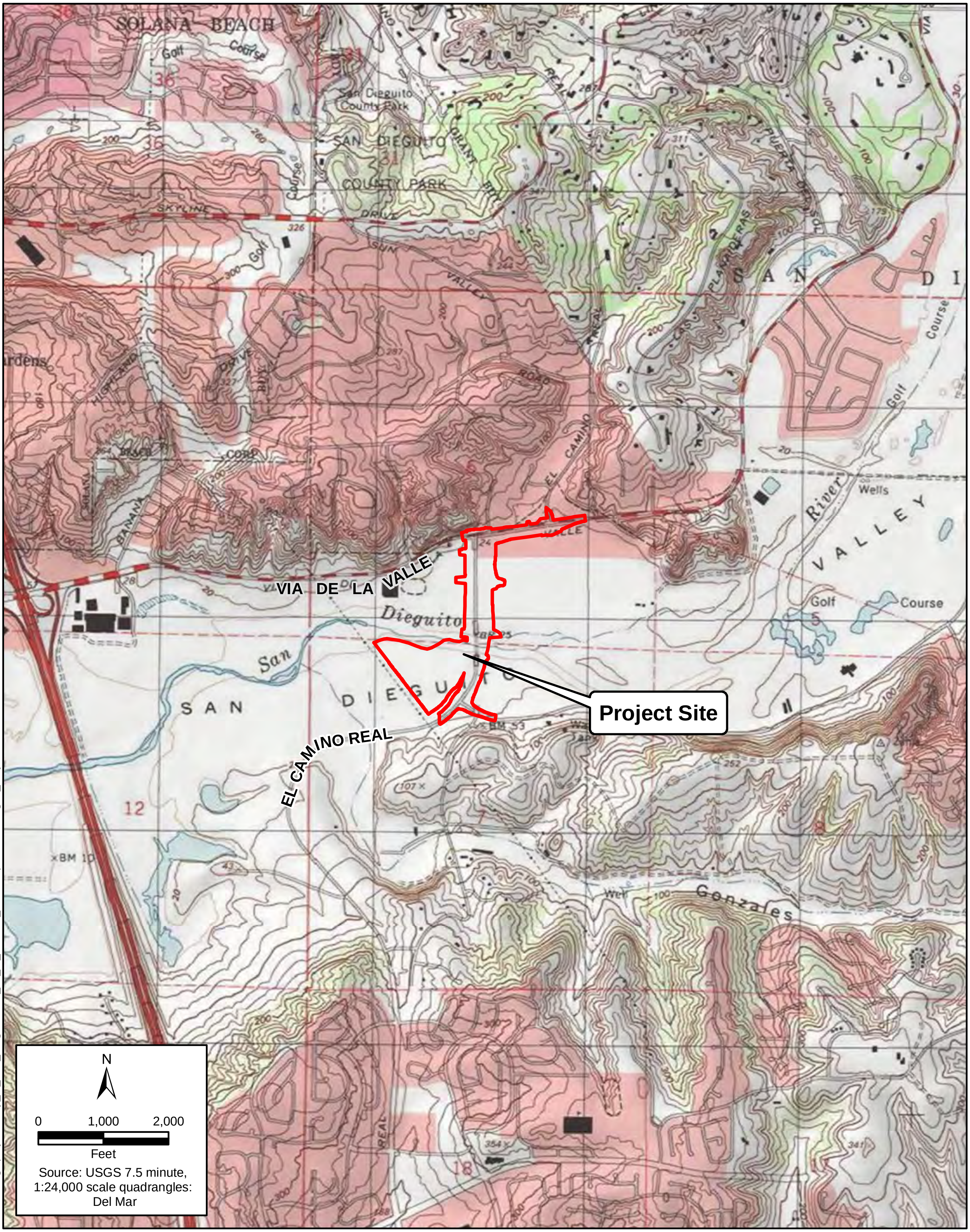

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Figure 2
Project Location
El Camino Real Bridge Replacement Project

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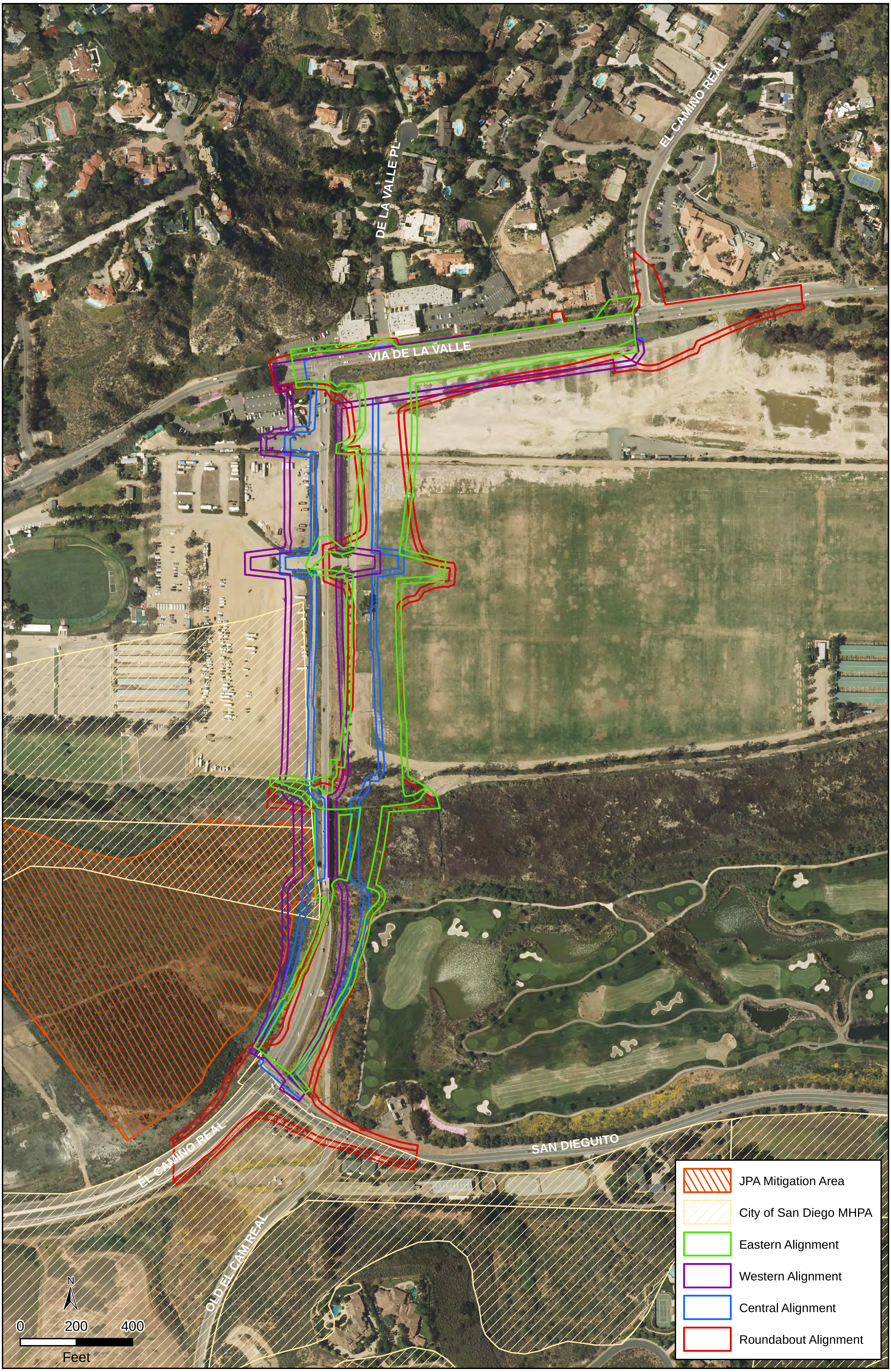


Figure 3
Proposed Project Alternatives
El Camino Real Road and Bridge Widening Project

- Western Alignment Alternative,
- Eastern Alignment Alternative, and
- Roundabout Alignment Alternative.

The bridge for all alternatives will be approximately 6 ft higher than the existing bridge (top of bridge deck at + 31 ft MSL vs + 25 ft MSL) and would convey the 100-year flood event. In addition, all bridge alternatives would be 76 ft wide compared to 27 ft wide for the existing bridge. All alternatives except the Eastern alignment would be 342 ft long, similar to the existing bridge length of 340 ft. The Eastern alignment bridge would be 355 ft long.

The Project would be constructed in stages for the western and Central Alignment Alternatives, where the existing road and bridge would remain open during construction until one new side is constructed, and then traffic would be diverted to the new side while the other side of the road and bridge are constructed. For the eastern and Roundabout Alignment Alternatives, the bridge and road north of the bridge would be constructed in one stage, independently of the existing bridge and road. Construction would last approximately 2.5 to 3.5 years, depending on the alternative. The estimated construction schedules take into account the requirement to restrict all construction over and within the river during the time period of February 1 to September 30 (encompassing the breeding seasons for light-footed clapper rail [*Rallus longirostris levipes*] and least Bell's vireo [*Vireo bellii pusillus*]) to avoid noise impacts to sensitive birds. Construction of the western and Central Alignment Alternatives would span three breeding seasons, and construction of the eastern and Roundabout Alignment Alternatives would span two breeding seasons.

1.2.1. Project Alternatives

Key characteristics of the build alternatives are highlighted below.

Western Alignment Alternative: This alternative would have an alignment that is shifted west relative to the existing alignment to avoid impacts to the wetlands in the drainage ditch parallel to the eastern edge of El Camino Real. El Camino Real would be widened to 104 ft to accommodate four travel lanes, a raised central median, bicycle lanes, and pedestrian walkways/parkways. The road would be elevated above the 100-year flood level on fill with 2:1 side slopes. The Western Alignment would take approximately 3.5 years to construct and would span three light-footed clapper rail breeding seasons.

Central Alignment Alternative: This alternative would be roughly centered on the existing alignment of El Camino Real and would impact neighboring properties on the east and west sides of the road relatively equally. El Camino Real would be widened to 104 ft to accommodate four travel lanes, a raised central median, bicycle lanes, and pedestrian walkways/parkways. The road would be elevated above the 100-year flood level on fill with 2:1 side slopes. The Central Alignment would take approximately 3.5 years to construct and would span three light-footed clapper rail breeding seasons.

Eastern Alignment Alternative: This alternative would have an alignment that is shifted completely east of the drainage ditch that is parallel to the eastern edge of the existing alignment to allow independent construction of the bridge, minimize impacts to developed properties along the western side of El Camino Real (Horsepark and Mary's Tack and Feed), and reduce impacts to wetlands in the drainage ditch parallel to the eastern edge of El Camino Real. El Camino Real would be widened to 104 ft to accommodate four travel lanes, a raised central median, bicycle lanes, and pedestrian walkways/parkways. The road would be elevated above the 100-year flood level on fill with 2:1 side slopes and would intersect with Via de la Valle at De la Valle Place, east of the existing intersection of El Camino Real with Via de la Valle. The Eastern Alignment would take approximately 2.5 years to construct and would span two light-footed clapper rail breeding seasons.

Roundabout Alignment Alternative: This alternative would be in the same alignment as the Eastern Alignment Alternative; however, roundabouts instead of signalized intersections would be located where El Camino Real meets San Dieguito Road, the Polo Field/Horsepark driveways, and De la Valle Place; and where Via de la Valle meets El Camino Real North. The footprint of the Roundabout Alignment Alternative would be larger than for the Eastern Alignment Alternative due to the need for transitions eastward and northward at the intersection of Via de la Valle and El Camino Real North, and the need for additional area to accommodate the roundabouts compared to typical intersections. The Roundabout Alignment would take approximately 2.5 years to construct and would span two light-footed clapper rail breeding seasons.

1.2.2. Common Design Features of the Alternatives

All of the build alternatives will provide the following key components:

- The roadway of El Camino Real will be raised on fill above the 100-year flood level between San Dieguito Road and Via de la Valle, and will meet existing grade at these locations.
- The bridge over the San Dieguito River will be demolished and replaced with a new structure raised above the 100-year flood level. The new bridge will be supported on cylindrical bridge piles and finished concrete columns. Abutments under the bridge will be protected from erosion by riprap, and the bank slope under the new bridge will be steepened to be approximately 1.5:1.

- All build alternatives will provide an elevated multi-use trail undercrossing under the north bridge abutment. The trail undercrossing will be set at the 10-year flood level and will provide 12 ft of vertical clearance between the trail surface and the underside of the bridge. The new bridge height will be approximately 6 ft greater than the height of the existing bridge at the north abutment. In addition, all alternatives will accommodate future trails in the project area. The JPA recently extended the Coast to Crest Trail from the western boundary of Horse Park to near the western edge of the existing El Camino Real Bridge. This segment of the Coast to Crest Trail was presented in the *Park Master Plan for the Coastal Area of the San Dieguito River Valley Regional Open Space Park*, *San Dieguito River Park Joint Powers Authority, 2000*. Impacts associated with trail construction and any mitigation for those impacts are the responsibility of the JPA and are not included in this NES.
- Via de la Valle will be widened to its ultimate width from the modified intersection with El Camino Real eastward to El Camino Real North. The existing dual 19-inch by 30-inch reinforced concrete pipe storm drain culvert under Via de la Valle near El Camino Real North will be replaced with an underground triple reinforced concrete box sized to pass the 100-year peak storm event from the upstream tributary north of Via de la Valle onto the property south of Via de la Valle. The 100-year peak storm event for that tributary is approximately 680 cubic ft per second.
- Project impacts to wetlands will be mitigated by enhancement and creation on a parcel owned by the JPA located west of the affected portion of El Camino Real (formerly the Boudreau property). The JPA mitigation area does not support sufficient area to meet the mitigation requirements for the Roundabout Alignment Alternative. Additional mitigation opportunities are being negotiated by the City with the San Diego Association of Governments (SANDAG).
- Project impacts to sensitive upland habitats, i.e., disturbed Diegan coastal sage scrub, will be mitigated through purchase of credits from the City’s Cornerstone Lands. This mitigation strategy allows for preservation of high quality habitat and can accomplish the mitigation of 14.77 - 15.25 ac, depending on alternative, that cannot be accomplished on the JPA mitigation site.

1.2.3. Impact Areas and Construction Activities

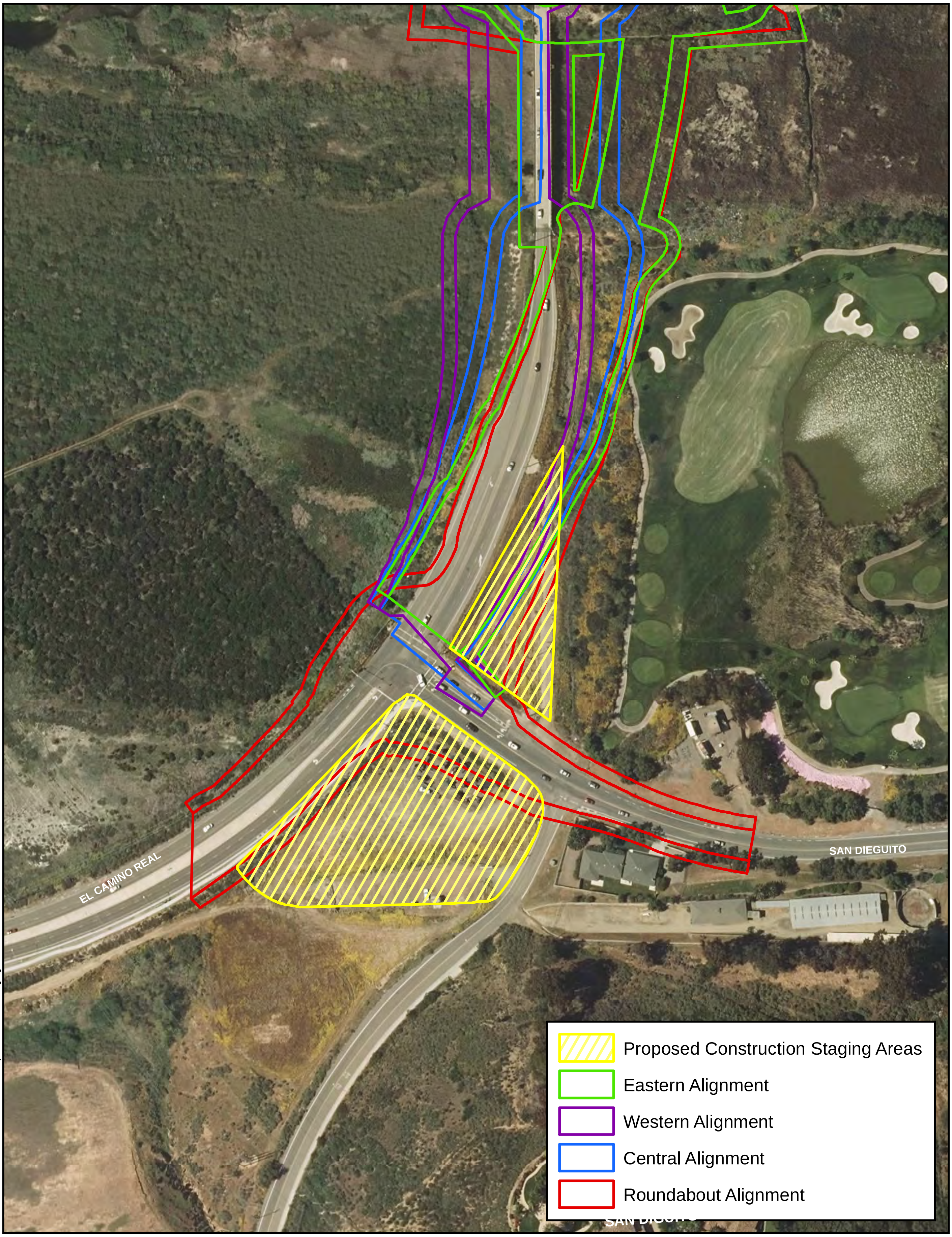
The delineated impact area includes areas permanently covered by Project features (e.g., the bridge, manufactured slopes, sidewalks, etc.), referred to as the permanent footprint, as well as construction corridors and staging areas that would be disturbed only during Project construction, referred to as construction corridors.

The construction corridors would result in temporary impacts and would be restored to their original condition and/or revegetated following Project completion. This onsite restoration would not count as mitigation for the Project's impacts to sensitive biological resources. Construction access would be obtained through areas already considered impacted by the proposed Project (i.e., the permanent footprint or construction corridor). Thus, access roads are not considered separately in this report. A staging area has been proposed at the southern end of the Project area, just northeast of the junction of El Camino Real and San Dieguito Road. An unpaved parking area situated north of the river and west of El Camino Real could be used as an additional staging area for activities occurring north of the river. Use of this area would not result in additional impacts to sensitive biological resources. Proposed staging areas are illustrated in Figure 4.

All build alternatives will require construction activities within the San Dieguito River or elevated above and across the river. Two options have been identified to accomplish this requirement: 1) earthen berms that cross the river, or 2) elevated trestles that cross the river. These features are considered necessary to provide a stable pad for construction of the new bridge and demolition of the existing bridge, as summarized below and in presented in detail in Appendix I. It should be noted that these two construction options are conceptual and apply to all potential alternative alignments and, thus, may not be used to differentiate alternatives.

Berm Option. Under this option, the contractor would build a single temporary earthen berm or multiple berms that would provide a working pad area approximately 30 ft east and 30 ft west of the proposed bridge. The total width of the berms would vary based on the height of the fill placed, but it is anticipated that these berms would be approximately 10 ft above the existing river bottom and would extend approximately 30 ft outside of the edge of deck on each side of the bridge, thus would be approximately 150 ft wide at the top if a single berm was used. The berms would extend from the north bank to the south bank of the San Dieguito River, with a least one opening of approximately 40 ft in width to allow for river flows and for use as a wildlife corridor. It is estimated construction of the berms for constructing the bridge would take 1 -2 months. Using the berm and the embankment, the contractor would construct the piles, columns, and place temporary falsework for the construction of the superstructure of the bridge.

Upon completion of the berm, the Cast In Drilled Holes (CIDH) piles that support the bridge would be constructed. Piles will be constructed using a large drill rig, large crane, front-end loader, Baker tanks for drilling fluid storage, dump trucks for spoil removal, and other typical construction equipment.



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Source: Eagle Aerial

El Camino Real Bridge Construction

Construction Staging Areas

Figure 4

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The CIDH pile foundations will be constructed by drilling through the berm, placing a casing and/or drilling slurry to maintain the hole, placing the pre-fabricated steel cage into the hole and pumping the required concrete mix into the drilled shaft while holding the steel cage and casing in place with other large cranes. This operation will be repeated to construct the required number of columns. Upon completion of each pile, the contractor can begin construction on the columns for the bridge. After the columns are complete, the contractor can construct falsework to support the bridge superstructure. If the berms are stable enough, falsework may be constructed on the berm on spread footings. If the berms are not stable enough, piles driven through the berm would be required to support the superstructure.

Assuming that driven piles are needed, the contractor would drive temporary steel piles through the berm to create a foundation for each falsework bent. Falsework piles will likely be 20 inch diameter steel shell piles. This would be accomplished by staging the pile driving rig on the berm or on the embankment near the abutment. Subsequent piles would be driven with the pile driving rig on the berm. The number of piles (if used) in a falsework bent and the number of falsework spans is to be determined by the contractor; however, an estimate of the typical spacing of piles is 1 falsework bent every 30 ft, with 16 - 20 piles/bent located beneath the bridge spaced at 5 ft on center measured perpendicular to the bridge. It is estimated that the number of piles required to support the falsework for an approximately 350-foot long bridge would total 300 temporary piles with 13 falsework bents constructed in the river beneath the bridge and 2 bents on abutments beneath the bridge. Upon completion of bridge construction, the contractor will deconstruct the falsework in an opposite manner in which it was constructed. The temporary piles may be vibrated out of the sediment or may be cut off approximately 2 ft below ground surface and backfilled. Limited access under the 90-foot-wide bridge will significantly affect the ability and cost of removing the piles.

Once the bridge construction is completed, the berm material would be used to construct a third berm on the west side of the new bridge extending under the existing bridge to provide a pad for demolition of the existing bridge. The berm would be accessed by construction personnel and equipment to facilitate demolition and removal of the concrete deck, beams and pier walls. It is likely that the combined access from the berm and the deck of the existing structure will be utilized to remove the deck and beams.

The berm would act as a barrier, preventing demolished concrete, steel and other debris from falling into the San Dieguito River. The contractor can mobilize demolition equipment onto the berm, demolish each pier and collect the material on the berm. It is proposed that the contractor would remove existing pier walls 2 ft below the original riverbed, leaving footings and piles below in place. This would be the least impactful scenario. To remove the existing piers below grade, it may be necessary to drive a sheet pile coffer dam around the existing piers after the superstructure is removed, providing access to the foundation while controlling the water at that elevation. These sheet piles would be vibrated into place and vibrated out when removed.

Demolished concrete, steel and other material would be transported off-site by conventional construction equipment, e.g., front-loaders and dump trucks accessing the berm. Once the existing bridge is demolished and all debris removed from the river bed, the Contractor would remove the berm material from the river return the river to its preconstruction contours.

Trestle Option. Under the trestle option, driven piles would be required for support of both an elevated trestle on both sides of the bridge that provide access in a manner similar to the berm and for support of the falsework beneath the bridge, effectively doubling the number of piles needed for bridge construction. The trestle would provide a 30-foot–wide stable platform on each side of the bridge across the entire width of the river. This option would allow unimpeded flows in the river and unimpeded movement by wildlife during the 2.5- to 3.5-year construction process. Approximately 400-500 temporary piles would be driven for this option using an either a diesel-driven impact hammer or a quieter hydraulic impact hammer and removed using a vibratory hammer. Driving the piles with an impact hammer will be necessary to ensure they have the capacity to support the heavy equipment necessary to construct the bridge. Additional piles would be needed to demolish the existing bridge.

CIDH pile foundations would be constructed in a manner similar to that presented above, except that the foundation would not need to be drilled through the berm material. A steel casing would be placed to act as a coffer dam to allow the pile and column construction in the river without the need for a berm. Falsework would be supported on piers consisting of piles driven beneath the bridge. These piles would be driven from the abutments and on the trestle.

A third trestle would be required to demolish the existing bridge. This structure would be as complex as trestles built to construct the bridge, however it can be narrower. Use of a trestle for demolition will require a netting system (or equivalent) supported from the trestle and existing piers to prevent debris from dropping into the San Dieguito River during demolition.

Upon completion of the demolition of the existing superstructure, this third trestle will be required to provide access to drive sheet piles around existing piers to facilitate partial removal of the substructure below grade.

It is estimated that approximately 700 - 800 total driven piles would be required for this option, including the third trestle needed for demolition of the existing bridge (400 – 500 piles for bridge construction and an approximately300 additional piles for demolition of the existing bridge). Piles would be driven during the non-breeding season for light-footed clapper rails and least Bell's vireo (October 1 – January 30). The duration of pile-driving under this option could be 2-3 months. It is proposed that the contractor would remove existing pier walls 2 ft below the existing riverbed, leaving footings and piles below in place.

Construction of the new bridge and demolition of the existing bridge will be conducted during the non-breeding season (October 1 – January 30); however, construction of the road widening and approaches to the bridge will occur during the breeding season. In order to meet the Wildlife Agencies requirement that noise from construction may not exceed 60 dBA at the edge of the river during breeding season, noise modeling was conducted (Appendix J).

The model indicates that noise from construction activities unrelated to pile driving (grading, paving bridge construction, bridge demolition) are approximately 60 dBA at 50 ft from the source using noise state-of-the-art noise attenuation measures (Appendix J). The construction noise modeling is based on reference noise levels that were measured from actual pieces of equipment at 50 ft away. Fifty feet is a practical distance that most receptors would be located from heavy construction equipment due the nature of a typical construction site and the mobility of equipment. The noise calculations are based on composite noise levels combining numerous types and pieces of equipment. The inverse square law of noise propagation, which applies to energy that is radiated outward, is used to determine noise levels farther away from the source. Thus, with noise attenuation measures, such as noise walls, it is predicted that construction activities can occur approximately 50 ft from the edge of the river during the breeding season.

Noise modeling indicates that noise from pile driving may exceed 60 dBA at a distance of approximately 1,200 from the source for hydraulic pile drivers and more than 4,000 ft from the source for diesel-driven pile drivers (see Noise Modeling Memorandum Appendix J). It is not known for certain how many individual Ridgway's rails use the portion of the river within 1,200 to 4,000-ft of proposed pile driving locations (which vary with bridge alternatives) as individual rails move about within the river while foraging; however, based on the 2012 distribution of Ridgway's rails in the Project area, noise from diesel-driven pile drivers would exceed 60dBA at the locations of 17 pairs and 17 individual rails. Noise from hydraulic pile driving would exceed 60 dBA at the locations of nine individual rails and six paired rails. Thus, noise from pile-driving will exceed 60 dBA at approximately 1,200 to 4,000 ft to the east and west of the proposed new bridge and existing bridge during construction and demolition, depending on which type of pile driver is used. This noise may affect the resident population of light-footed clapper rails as discussed in Section 4.4.6.

The alignment of the existing bridge is not situated within the proposed alignment for the Eastern or the Roundabout Alignment Alternative. Thus, under these alternatives, demolishing the bridge would result in additional impacts. These impacts have been incorporated into the footprints for the Eastern and Roundabout Alignment Alternatives.

The mitigation area proposed for this Project (JPA mitigation area) currently supports vegetated areas. Impacts occurring in this area in association with the mitigation plan are also addressed in this NES.

1.2.4. JPA Mitigation Area

Impacts to wetlands would occur from all of the alternatives. Mitigation for impacts (both permanent and temporary) to wetlands resulting from the Project would be accomplished through wetland creation/enhancement on a parcel owned by the JPA (JPA mitigation area), formerly known as the Boudreau property. This parcel is located west of El Camino Real and south of the San Dieguito River. Historically, this area has supported agricultural practices but has remained fallow for several years. This area has revegetated naturally and currently supports native and nonnative vegetation. The mitigation site supports primarily disturbed Diegan coastal sage scrub – Baccharis dominated. This vegetation community is dominated by native coyote bush, also known as chaparral broom (*Baccharis pilularis*) and several non-natives species, including five-hook bassia (*Bassia hyssopifolia*), tree tobacco (*Nicotiana glauca*) and salt cedar, or tamarisk (*Tamarix ramosissima*). This vegetation community comprises 14.3 ac of the 21.88-ac mitigation area. Other upland habitats occurring within the mitigation site include disturbed land (3.48 ac) disturbed Diegan coastal sage scrub – coastal form (0.03 ac), and non-native grassland (0.04 ac).

Wetland habitats currently occurring within the JPA mitigation area are isolated, disturbed, and have low functions and values, and areas of higher quality habitat associated with the San Dieguito River. These include alkali marsh dominated by alkali weed (*Cressa truxillensis*; 0.48 ac), coastal freshwater marsh (0.05 ac), disturbed coastal brackish marsh (0.08 ac), disturbed southern willow scrub (1.49 ac), disturbed wetland (0.23 ac) and tamarisk scrub (1.69 ac). Impacts to these wetland habitats are necessary in order to convert the parcel into wetland habitats that are of high value and high function, and are connected to the existing wetlands/riparian corridor associated with the San Dieguito River. Not all of the wetlands occurring on the JPA mitigation site will be impacted. Disturbed and undisturbed coastal freshwater marsh will not be impacted, but are part of proposed enhancement. Only a small portion (0.07 ac) of disturbed southern willow scrub and 1.33 ac of the total 1.69 ac of tamarisk scrub will be converted to higher quality wetland habitat. All of the isolated alkali marsh (0.48 ac) will be converted to higher quality wetland habitat.

Upland and wetland habitats within the mitigation site, with the exception of the disturbed Diegan coastal sage scrub – coastal form, would be converted to southern coastal freshwater marsh, mule-fat scrub and southern willow scrub habitats as mitigation for project impacts. Disturbed Diegan coastal sage scrub – coastal form will not be converted to wetland habitat but will be impacted by the bridge alternatives and the protective berm on the mitigation site (discussed in detail below).

A conceptual restoration plan has been developed for the Project based on impacts to sensitive habitats associated with all alternatives. The conceptual restoration plan is presented in Appendix K and is presented in detail in Chapter 4. The plan has been designed to accommodate mitigation for impacts to all wetland habitats, both temporary and permanent, incurred by construction of the new bridge and demolition of the existing bridge. Wetland impacts will be mitigated through enhancement or creation of wetland habitats at ratios ranging from 1:1 to 4:1 as dictated by City of San Diego mitigation guidelines (City of San Diego 2002) and through agreements by the resource agencies that degraded wetlands on the JPA site can be mitigated at a 1:1 ratio. Detailed discussion of impacts and required mitigation is presented by habitat in Chapter 4 of this NES. Detailed discussion of the City's mitigation requirements is presented in Chapter 4 and in Appendix H. The conceptual restoration plan is presented here as an introduction to the City's proposed mitigation strategy.

A protective berm will extend parallel to the San Dieguito River that will prevent sedimentation and scour during high flow event. An opening at the western extent of the berm will provide hydrological connection with the river. The berm will impact a total of 1.48 ac comprised of 1.13 of ac of disturbed Diegan coastal sage scrub – Baccharis dominated, 0.03 ac of disturbed coastal sage scrub – coastal form, 0.21 ac of disturbed land and 0.11 ac of tamarisk scrub leaving approximately 20.4 ac of the JPA mitigation site available for conversion to wetland habitats as mitigation (1.16 ac of disturbed Diegan coastal sage scrub habitats mitigated at a 1:1 ratio and 0.11 ac of tamarisk scrub converted to upland berm at a 2:1 ratio = 1.38 ac required mitigation. No mitigation required for 0.21 ac disturbed land). Of the 20.4 ac available for mitigation, an additional 2.0 ac of impacts will occur to wetland habitats that are CDFW jurisdictional, including 1.22 ac of tamarisk scrub, 0.48 ac of alkali marsh, 0.23 ac disturbed wetland and 0.07 ac of disturbed southern willow scrub. Impacts to these low quality habitats will be mitigated within the JPA mitigation site at 1:1 (see Tables 4-1 – 4-4)).Thus, implementation of a mitigation project in this area would result in habitat conversion of vegetated areas, which would be treated as an impact. These impacts are not considered permanent impacts because this area would be converted to a different configuration of higher quality wetland habitats.

The berm would extend east–west from the existing bridge abutment and would be open on the western end. It would have a 10-ft-wide top, a height of 7 to 10 ft above the current ground level, and would be constructed at a 3:1 slope on both the channel side of the berm and the slope facing the mitigation area. An armored weir would be constructed within the berm and would be approximately 7 ft lower than the top of the berm. The weir would be approximately 250 ft long and would allow flows from the river to flow through the mitigation area during large flood events while excluding bedload sediment. During minor flood flows, the majority of water from the river would be deflected away from the mitigation area and remain in the river channel.

The primary feature of the proposed mitigation plan is the creation of approximately 15.4 ac of coastal freshwater marsh as mitigation for impacts to existing freshwater marsh and existing disturbed coastal salt marsh. This habitat will be created to compliment the freshwater marsh habitat in the San Dieguito River that is currently occupied by the federally-listed endangered and state-listed endangered and Fully Protected Species light-footed clapper rail (*Rallus longirostris levipes*) that will be impacted during construction/demolition. This proposed restoration would include mitigation for impacts to freshwater marsh and coastal salt marsh incurred by the Project, resulting in a portion of the overall mitigation that is out-of-kind. The rationale for this proposed out-of-kind mitigation is:

The disturbed coastal salt marsh habitat that will be impacted by the project is of very low quality having been used for years as a parking lot for various events and other activities;

There is little or no current opportunity for coastal salt marsh creation within the watershed as a result of two large-scale restoration projects in the tidally-influenced areas of San Dieguito Lagoon immediately west of the El Camino Real Bridge. These include the approximately 115-ac restoration recently constructed by Southern California Edison as mitigation for impacts associated with the operation of San Onofre Nuclear Generating Station and the approximately 127-ac San Dieguito Lagoon W19 Restoration Project currently being developed by SANDAG.

Freshwater marsh habitat in the project appears to be favored by the clapper rail despite their typical preference for low, cordgrass-dominated salt marsh habitat. As presented in Chapter 4, the population of clapper rails utilizing the freshwater marsh habitats of the San Dieguito River in the Project area and upstream for approximately 1 mile is the third largest population of this species in California with an estimated 45 paired and unpaired individual rails (Zembal and Hoffman 2012).

Impacts to other wetland habitats, including southern willow scrub, mule-fat scrub and disturbed wetlands would be mitigated through enhancement/creation of similar habitats in excess of City mitigation requirements. Detailed discussion of impacts and proposed mitigation is presented by habitat in Chapter 4.

Through creation and enhancement of freshwater marsh and riparian habitats, the conceptual restoration plan will significantly benefit the clapper rail by:

- Improving water quality and habitat value through the restoration of agricultural land;
- Increasing native cover and protection around breeding areas;
- Removing invasive plant species within and adjacent to the riparian corridor;
- Replanting with native riparian species where exotic species are removed; and
- Creating new breeding and foraging habitat.

The area proposed for creation of freshwater marsh habitat is located adjacent to similar existing habitat in the San Dieguito River. The mean salinity of the ground water in the area, as measured by a monitoring well installed in roughly the center of the JPA mitigation site for the W-19 project and monitored from 11/30/2012 through 3/21/2013, was 4.5 parts per thousand (n=5) compared to approximately 35 parts per thousand for sea water. Thus, it is not anticipated that the habitats proposed as mitigation will convert to other habitats, such as salt marsh. In addition to habitat-based mitigation, measures to minimize direct and indirect impacts to the light-footed clapper rail and federal- and state listed endangered least Bell's vireo will be implemented during construction. These are presented by species in Chapter 4.

Mitigation for Project impacts to wetland habitats associated with the Central, Western and Eastern Alignments can be accomplished in their entirety on the JPA mitigation site. Mitigation for the Roundabout Alternative will require the JPA mitigation site and additional lands. Mitigation for the Roundabout Alternative impacts to 6.4353 ac of wetlands from road and bridge improvement at City ratios requires creation of 24.6672 ac of wetland habitat. This exceeds the capacity of the proposed JPA mitigation area. An additional 2.11 ac of wetland habitat will be impacted at the JPA site for a total wetland mitigation burden of 26.8872 ac. The Roundabout Alternative would require an additional 6.48 acres of wetland mitigation beyond the JPA mitigation site. The City of San Diego owns a parcel in Gonzales Canyon immediately south of the JPA site and south of El Camino Real that is considered suitable for mitigation, through a combination of creation and enhancement on up to 10.8 acres. A Memorandum of Understanding is in process should it become necessary to proceed with this additional mitigation. Details on this additional wetland creation and enhancement are presented in Chapter 4. Impacts to sensitive upland habitats, including 0.787 ac of disturbed Diegan coastal sage scrub associated with road and bridge improvement and 14.33

ac disturbed Diegan coastal sage scrub habitats associated with the JPA mitigation site, will be mitigated through purchase of credits from the City's Cornerstone

1.2.5. Staging Area

The designated staging areas for Project construction total approximately 3 ac and include a privately owned parcel bounded by El Camino Real, Old El Camino Real, and San Dieguito Road that is periodically used by fruit, Christmas tree, and pumpkin vendors; and City-owned property within the alignment of Old El Camino Real north of San Dieguito Road and east of the curved portion of El Camino Real (Figure 4). These areas have been previously used as staging areas for projects in the area including construction of the undercrossing of El Camino Real of Gonzales Canyon in 2012. The staging areas are primarily undeveloped and disturbed land; a small patch of Diegan coastal sage scrub occurs within the northern staging area but would be fenced and avoided during construction. Upon completion of construction, the disturbed parts of the staging area would be cleared, re-graded to match existing conditions, and, where appropriate, hydroseeded with the approved upland native plant palette. It is anticipated that the privately owned parcel will not be seeded with native plant species. An unpaved parking area situated north of the river and west of El Camino Real could be used as an additional staging area for activities occurring north of the river.

1.2.6. Drainage Improvements

Flow in the drainage ditches parallel to the south edge of Via de la Valle and the east edge of El Camino Real arises from runoff from the surrounding drainage area that extends into the rural residential area north of Via de la Valle and encompasses approximately 1 square mile. The 100-year flow rate from the local area estimated with the Natural Resources Conservation Service (NRCS) hydrologic method is 680 cfs. Runoff is directed from the north to the south under Via de la Valle in two existing 18-inch culverts and a headwall that was constructed in 1987 to direct low flows westerly along Via de la Valle. Runoff in the open drainage ditch on the south side of Via de la Valle eventually joins the drainage ditch that parallels El Camino Real and flows southward to the San Dieguito River. Runoff enters the open ditch parallel to El Camino Real via sheet flow.

Inefficiencies in runoff in this area are apparent from the extent of wetland vegetation growing in the northwestern corner of Via de la Valle and El Camino Real North. The drainage ditch on the south side of Via de la Valle from El Camino Real North to the segment of El Camino Real proposed to be widened supports freshwater marsh, and typically has ponded water, indicating minimal longitudinal slope and inefficient flow. The termination of the drainage ditch parallel to El Camino Real at the San Dieguito River is undefined and topographically inefficient, which also inhibits effective local drainage.

All alternatives propose a triple 10-ft by 3.5-ft RCB culvert to replace the existing culverts under Via de la Valle. Once on the south side of Via de la Valle, runoff from large storm events would continue to flow overland in a southerly direction toward the San Dieguito River as under existing conditions. However, low flows (nuisance runoff) would be conveyed in a low-flow storm drain that would be constructed within widened Via de la Valle. This runoff would be directed from the upstream edge of the proposed culvert system to the existing ditch just east of existing El Camino Real. This design would maintain low flows to the existing ditch parallel to existing El Camino Real while still allowing large flows to be conveyed southerly toward the San Dieguito River. Although all of the build alternatives would eliminate the existing ditch parallel to the south edge of Via de la Valle, appropriate mitigation for wetland vegetation impacted would be provided. All of the alternatives except for the Central Alignment alternative would minimize changes to the ditch parallel to El Camino Real in order to sustain existing conditions as much as possible. The Central Alignment alternative would recreate the ditch parallel to El Camino Real along the east side of the widened road.

1.2.7. Utility Relocation

For all alternatives except the Eastern Alignment Alternative and Roundabout Alignment Alternatives, utilities buried in El Camino Real would need to be relocated vertically because the proposed road elevation would change. These utilities include gas and sewer pipelines. Overhead power and communication facilities would be relocated to the new edge of the roadway.

For the Eastern Alignment Alternative and Roundabout Alignment Alternatives, utilities buried in the portion of El Camino Real between the north end of the bridge and Via de la Valle could be relocated to the new alignment in order to remain in a public right-of-way, or suitable easements could be obtained to keep the utilities in their existing location. San Diego Gas & Electric (SDG&E) may choose to keep their overhead power lines in the shoulder of the existing roadway if they obtain suitable easements.

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Chapter 2. Study Methods

Potential biological resource issues relating to the proposed Project were identified through biological surveys and review of existing information, as described in this chapter.

Prior to conducting any fieldwork, updated searches of available literature and databases were conducted to determine special-status species historically reported or with potential to occur within the Project site as well as the physical characteristics of the site and surrounding areas. Available data that were reviewed included: the California Natural Diversity Database (CNDDB) (CDFG 2011a); California Native Plant Society (CNPS) Online Plant Inventory (CNPS 2011); the U.S. Department of Agriculture (USDA) soil survey of the area (USDA 1973); and USGS topographic maps to identify potential stream courses and other notable topographic features.

Documents pertaining to the Project area were reviewed, including the City of San Diego Multiple Species Conservation Program (MSCP), San Dieguito River Park Concept Plan, the Final Program Environmental Impact Report for the San Dieguito River Park Concept Plan, and the 2006 NES (Tierra).

2.1. Regulatory Requirements

This section provides summary background information regarding the applicable regulations for protecting biological resources that are pertinent to the proposed Project and anticipated impacts.

2.1.1. Federal Requirements

2.1.1.1. CLEAN WATER ACT

In 1948, Congress first passed the Federal Water Pollution Control Act. This act was amended in 1972 and became known as the Clean Water Act (CWA). The CWA regulates the discharge of pollutants into the waters of the U.S. Under Section 404, permits need to be obtained from the U.S. Army Corps of Engineers (USACE) for discharge of dredge or fill material into waters of the U.S. Under Section 401 of the act, Water Quality Certification from the Regional Water Quality Control Board (RWQCB) needs to be obtained if there are to be any to impacts to waters of the U.S.

2.1.1.2. EXECUTIVE ORDER 11990 PROTECTION OF WETLANDS

This order establishes a National policy to avoid adverse impacts to wetlands whenever there is a practicable alternative. Under Executive Order 11990 there can be no net loss of wetlands resulting from the project. CALTRANS promulgated DOT Order 5660.1A in 1978 to comply with this direction. On federally funded projects, impacts to wetlands must be identified in the environmental document. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific Wetlands Only Practicable Alternative Finding in the final environmental document. Wetland impacts that cannot be avoided must be mitigated through restoration, creation or enhancement of existing wetlands at ratios determined by federal resource agencies. An additional requirement is to provide early public involvement in projects affecting wetlands. The Federal Highway Administration (FHWA) provides technical assistance in meeting these criteria (FHWA Technical Advisory 6640.8A) and reviews environmental documents for compliance.

2.1.1.3. MIGRATORY BIRD TREATY ACT

The Migratory Bird Treaty Act (MBTA) was enacted in 1918. Its purpose is to prohibit the kill or transport of native migratory birds, or any part, nest, or egg of any such bird unless allowed by another regulation adopted in accordance with the MBTA. There is a list of species that are protected by this act. The nests of birds protected by MBTA likely occur on site.

2.1.1.4. NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) declares a continuing federal policy "to use all practicable means and measures...to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations." NEPA directs "a systematic, interdisciplinary approach" to planning and decision-making, and requires environmental statements for "major Federal actions significantly affecting the quality of the human environment." Implementation regulations by the Council on Environmental Quality (CEQ) (Code of Federal Regulations [CFR], Title 40, Parts 1500–1508) require federal agencies to identify and assess reasonable alternatives to proposed actions that would restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts. Federal agencies are further directed to emphasize significant environmental issues in project planning and to integrate impact studies required by other environmental laws and Executive Orders into the NEPA process. The NEPA process should therefore be seen as an overall framework for the environmental evaluation of federal actions.

2.1.1.5. FISH AND WILDLIFE COORDINATION ACT

This act applies to any federal project where the waters of any stream or other body of water are impounded, diverted, deepened, or otherwise modified. Project proponents are required to consult with the U.S. Fish and Wildlife Service (USFWS) and the appropriate state wildlife agency. These agencies prepare reports and recommendations that document project effects on wildlife and identify measures that may be adopted to prevent loss or damage to wildlife resources. The term wildlife includes both animals and plants. Provisions of the act are implemented through the NEPA process and Section 404 permit process.

2.1.1.6. FEDERAL ENDANGERED SPECIES ACT

The Federal Endangered Species Act (FESA) and subsequent amendments provide guidance for the conservation of endangered and threatened species and the ecosystems upon which they depend.

Section 7 requires federal agencies, in consultation with, and with the assistance of, the Secretary of the Interior or the Secretary of Commerce, as appropriate, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species. For the proposed Project, the USFWS is responsible for administering the FESA. Regulations governing interagency cooperation under Section 7 are found in 50 CFR Part 402. The opinion issued at the conclusion of consultation would include a statement authorizing take that may occur incidental to an otherwise legal activity.

2.1.1.7. EXECUTIVE ORDER 13112 - INVASIVE SPECIES

On February 3, 1999, President Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” FHWA guidance issued August 10, 1999, directs the use of the state’s noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

2.1.2. State Requirements

2.1.2.1. CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE CODE, SECTION 1600-1616

Under these sections of the California Department of Fish and Wildlife Code, CALTRANS and other agencies are required to notify the California Department of Fish and Wildlife (CDFW) prior to any project that will divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed

Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project.

2.1.2.2. California Fully Protected Species

The State of California first began to designate species as "fully protected" prior to the creation of the California Endangered Species Act (CESA). Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction, and included fish, mammals, amphibians and reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under CESA and/or FESA. The regulations that implement the Fully Protected Species Statute (CDFW Code Section 4700) provide that fully protected species may not be taken or possessed at any time. Furthermore, CDFW prohibits any state agency from issuing incidental take permits for fully protected species, except for necessary scientific research.

2.1.2.3. Porter-Cologne Water Quality Act

Under the state Porter-Cologne Water Quality Control Act, the State Water Resources Control Board and regional boards assert jurisdiction over many discharges into "waters of the state." Where resources are subject to both state and federal regulations, Porter-Cologne compliance is coordinated with CWA Section 401 certification.

2.1.2.4. California Environmental Quality Act

The California Environmental Quality Act (CEQA) establishes state policy to prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures. CEQA applies to actions directly undertaken, financed, or permitted by state lead agencies. Regulations for implementation are found in the state CEQA Guidelines published by the Resources Agency. These guidelines establish an overall process for the environmental evaluation of projects that is similar to that promulgated under NEPA.

2.1.2.5. Native Plant Protection Act

California's Native Plant Protection Act (NPPA) requires all state agencies to utilize their authority to carry out programs to conserve endangered and rare native plants. Provisions of NPPA prohibit the taking of special-status plants from the wild and require notification of CDFW at least 10 days in advance of any change in land use. This allows CDFW to salvage listed plant species that would otherwise be destroyed. CALTRANS is required to conduct botanical inventories and consult with CDFW during Project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

2.1.2.6. California Department of Fish and Wildlife Code, Section 3503 and 3503.5

Section 3503 of the California Department of Fish and Wildlife Code makes it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 affords this protection to Falconiformes and Strigiformes in particular.

2.1.3. Local Requirements

2.1.3.1. City of San Diego Multiple Species Conservation Program

The Project lies within the boundaries of the MSCP. The MSCP is a conservation program designed to facilitate the implementation of a regional habitat preserve by coordinating project impacts and mitigation while allowing the issuance of “take” permits for sensitive upland species at the local level (City of San Diego 1997). This habitat preserve is known as the Multi-Habitat Preserve Area (MHPA) and lands within it have been designated for conservation. Various jurisdictions, including the City of San Diego, have developed MSCP Subarea plans to establish guidelines for the implementation of their respective preserve areas which are included in the regional MHPA. The proposed Project alignment is situated partially within the Northern Area of the MHPA established by the City’s subarea plan (Figure 3). A portion the Project area situated west of El Camino Real and a portion situated south of El Camino Real and south of San Dieguito Road occur within the MHPA. In addition, habitats occurring west of El Camino Real are situated within the City of San Diego Coastal Overlay Zone.

Species covered by the MSCP that were observed in the Project area are presented in section 5.15.1. All sensitive plant and animal species that might occur in the Project area, including all MSCP covered species and City of San Diego narrow endemic species, are presented in Appendix C.

2.2. Studies Required

Various surveys have been conducted in support of this Project. The general Biological Study Area (BSA) established for this Project is defined as the combined limits of disturbance from the four alternatives as well as the JPA mitigation area and proposed staging areas. The BSA includes only those portions of the staging areas that will be permanently impacted by widening of El Camino Real. Approximately 1.3 ac of the staging areas will be permanently impacted. The remaining 1.4 ac of the proposed staging areas that will not be affected by road widening were not included in the BSA as these were previously disturbed and will not require mitigation.

A portion of the BSA occurs within the Rancho Del Mar property, which is located south of Via de la Valle, north of the polo fields, and east of El Camino Real. The property owner did not grant the City access into this area. No studies were conducted within the Rancho Del Mar property.

A series of field studies were conducted in 2009 including the following:

- Vegetation mapping,
- Focused surveys for the least Bell's vireo (*Vireo bellii pusillus*),
- Special-status plant surveys,
- Formal jurisdictional delineation,
- Habitat assessment for bats,
- Habitat assessment for the Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), and
- Habitat assessment for the southwestern willow flycatcher (*Empidonax traillii extimus*).

The general BSA was used for mapping of vegetation communities, special-status plant surveys, the formal jurisdictional delineation, and for the habitat assessment for Belding's savannah sparrow and southwestern willow flycatcher (Figure 5). More specific BSAs were established for the habitat assessment for bats and for focused surveys for least Bell's vireo. The BSA for the bat habitat assessment included the existing bridge and vegetation in the immediate vicinity (Figure 5). The BSA for focused surveys for least Bell's vireo included riparian scrub vegetation within 500 ft of the existing bridge (Figure 5).

In 2011 it was deemed necessary that the following studies be updated:

- Vegetation mapping,
- Habitat assessment for special-status plants,
- Habitat assessment for bats,
- Habitat assessment for the Belding's savannah sparrow,
- Habitat assessment for the southwestern willow flycatcher, and
- Formal jurisdictional delineation.

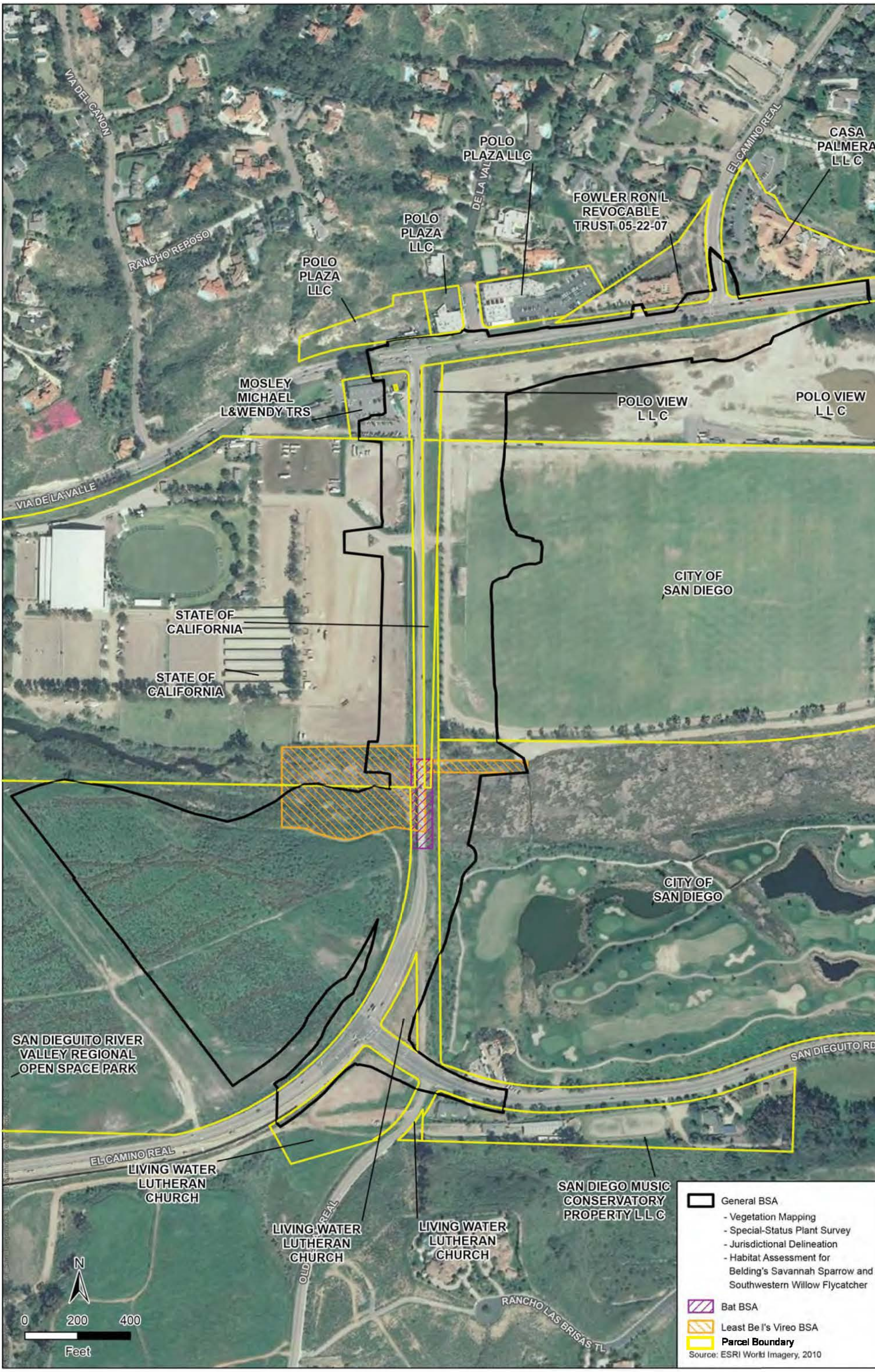

Figure 5
Biological Study Areas
El Camino Real Bridge Replacement Project

According to the NES prepared in 2006 (Tierra 2006), coordination with the City, USFWS, and CDFW, determined that updated light-footed clapper rail (*Rallus longirostris levipes*) surveys and updated arroyo toad (*Anaxyrus* (=*Bufo*) *californicus*) surveys/habitat assessments were not required. Annual surveys of the light-footed clapper rail are conducted by the California Department of Fish and Wildlife for the San Dieguito River, including upstream and downstream of the El Camino Real Bridge. Thus, sufficient data has been collected for the population of light-footed clapper rail inhabiting areas in the vicinity of El Camino Real and additional surveys were not deemed necessary. Focused surveys for arroyo toad conducted in 1998 and 1999 determined that conditions on site are not considered suitable for this species. Furthermore, as stated in the 2006 NES, in 2004 the USFWS confirmed that additional arroyo toad surveys would not be required for this Project.

Updated focused surveys for least Bell's vireo were not required because this NES considers all areas of suitable disturbed southern willow scrub as being occupied by this species. However, focused surveys for least Bell's vireo were conducted by Nordby Biological Consulting April – July 2012 for the San Dieguito Lagoon W19 Restoration Project, which includes the mitigation site proposed for this Project. Those surveys were conducted approximately 500 ft east and west of the El Camino Real Bridge in suitable habitat associated with the San Dieguito River and are thus applicable to this NES. The results of those surveys are presented in Appendix F.

In 2013, the W19 restoration project, which includes the proposed mitigation site for the El Camino Real Bridge Replacement Project, undertook the following updates:

- Vegetation mapping of the W19 parcel, including the proposed JPA mitigation site, conducted July 2013;
- Delineation of all federal and state wetlands of the W19 parcel, including the proposed mitigation site for the El Camino Real Bridge Replacement Project, conducted July 2013;
- Rare plant surveys of the W19 parcel, including the proposed mitigation site for the El Camino Real Bridge Replacement Project; conducted March – September 2013.

The results of those surveys have been incorporated into this NES. Vegetation communities and jurisdictional delineations within the JPA mitigation site supersede those conducted previously by ICF for the mitigation site only.

A list of potentially occurring plant and animal species covered by the City of San Diego's Multiple Species Conservation Program, as well as narrow endemic species is included in Appendix C**.**

2.2.1. Vegetation Mapping

Vegetation communities were mapped by ICF in 2010 and 2011within the general BSA in the field on a "one-inch equals 200 ft" (1:2400) scale aerial photograph of the study area and later digitized into a geographic information system (GIS) coverage using ArcGIS software. Mapping included the entire 55.78 ac (ac) BSA, and vegetation communities were categorized using standard Holland classifications.

An updated vegetation survey of the JPA mitigation site was conducted by S. Scatolini of CALTRANS District 11 and C. Nordby of Nordby Biological Consulting on July 2, 2013. Vegetation communities were mapped in the field on a "one-inch equals 200 ft" (1:2400) scale aerial photograph of the study area and later digitized into a geographic information system (GIS) coverage using ArcGIS software. Vegetation communities were categorized using Oberbauer's modified Holland classifications (Oberbauer et al. 2008). The new GIS file for the JPA mitigation area was then merged with the GIS files for the rest of the BSA by RBF Consulting and the merged files are presented in this NES.

2.2.2. Least Bell's Vireo Focused Surveys

In 2009, focused surveys for the least Bell's vireo were conducted in accordance with the Recommended USFWS Protocols (USFWS 2001). Eight separate surveys were conducted within the least Bell's vireo BSA at least 10 days apart between April 10 and July 31, and only during suitable weather conditions. The least Bell's vireo BSA comprised all areas of riparian scrub in the general BSA (Figure 5). Surveys were conducted on April 17 and 27, May 9, 19, and 30, June 9 and 23, and July 20, 2009, by qualified biologists (Table 2-1). All visits were performed during morning hours prior to 1100, when vireos are most active and included frequent stops to look for least Bell's vireo and listen for their vocalizations (songs and/or scolds). Surveys were not conducted during inclement weather, such as extreme hot or cold temperatures, fog, high winds, or rain. At this time, no special permits are required to perform focused surveys for least Bell's vireo in accordance with the recommended guidelines.

In 2012, focused surveys for least Bell's vireo were conducted in accordance with USFWS recommended protocols as presented above. Surveys were conducted May 24, June 4, June 13, June 25, July 6, July 16, July 26 and August 6 (Appendix F).

2.2.3. Special-Status Plant Surveys

Three special-status plant surveys were conducted during the spring and summer months to coincide with the blooming period for most special-status plants reported as potentially occurring on site. Surveys were conducted in April, May, and August of 2009 by walking meandering transects within the impact area for the western, central, and eastern Alignment Alternative alignments (Figure 3). On September 11, 2011, the JPA mitigation area and the additional impact areas associated with the Roundabout Alignment Alternative were assessed for their potential to support special-status species. This assessment determined that further special-status plant surveys were not required due to the low suitability of these areas and their low potential to support special-status plant species. During the 2009 survey and the 2011 assessment all plant species observed were documented and special-status plant species were mapped using a Global Positioning System (GPS). Plants that could not be identified in the field were identified at a later time using taxonomic keys including Hickman (1993) and Beauchamp (1986).

Rare plant surveys of the proposed mitigation site were conducted during March - September 2013 to coincide with the blooming period for most special-status plants reported as potentially occurring on site. AECOM conducted rare plant surveys for the JPA mitigation area including up to a 500-foot buffer. The mitigation site and associated buffer was surveyed a total of three times from early spring through the beginning of fall 2013 (see Table 2-2).

Surveys were conducted by walking meandering transects of varying width ensuring complete visual coverage of suitable natural habitats and general traversal coverage of unsuitable habitats (i.e., developed/disturbed areas). A comprehensive list of all vascular plant species observed was maintained. All vascular plant species observed were identified to a taxonomic level which allowed rarity to be determined. Plant species taxonomy and nomenclature follows the Jepson Manual, Second Edition (Baldwin et al. 2011).

Rare plant species detected were geo-referenced with a global positioning system (GPS), with either points or polygons displaying species distribution. Data collected for each rare plant species detected included, population estimates, phenology and general condition of the population, and potential threats to the population. These data will be used to document findings and complete a CNDDB California Native Species Field survey Form, which will allow the CNDDB to further build their database on rare plant occurrences within California.

2.2.4. Jurisdictional Delineation

2.2.4.1. PROJECT RESEARCH

To prepare for a field visit, surveyors obtained an aerial photograph (1 inch = 2,100 ft) of the site and used it to identify potential site features such as vegetation types, topographic changes, or visible drainage patterns.

Additionally, the relevant USDA soil survey map was reviewed to identify the soil series that occur on the Project site. These mapped soil series were compared with the Field Office

Official List of Hydric Soil Map Units (NRCS 2011) and the pertinent USDA Natural Resources Conservation Service (NRCS) Soil Survey online map to determine the presence or absence, and location, of hydric soils within the Project site (NRCS 2011).

2.2.4.2. FIELD INVESTIGATION

ICF International (ICF) biologist Andrew Borcher conducted the initial jurisdictional delineation on August 25, 2009. Due to a 2-year time lapse, surveys were updated in 2011. ICF biologist Dale Ritenour carried out an update to the delineation on August 16, 2011, and conducted a delineation of the JPA mitigation area on January 26, 2012. The general BSA was surveyed to determine the presence/absence of any potential jurisdictional features, though the Rancho del Mar property was not accessed for this delineation; any potential features identified were then investigated further to determine whether they met the criteria for federal, state, or local jurisdiction. All features were delineated following USACE, RWQCB, and CDFW guidance. On April 7 and July 10, 2013 S. Scatolini of CALTRANS District 11 and C. Nordby of Nordby Biological Consulting updated the jurisdictional delineation for the W-19 project, which includes the JPA mitigation area. Methodology was the same as that employed by ICF, as presented below. As with the updated vegetation survey, the new GIS file for the JPA mitigation area was then merged with the GIS files for the rest of the BSA by RBF Consulting and the merged files are presented in this NES. The full delineation report is included as an appendix to this NES.

2.2.4.3. DELINEATION METHODS

USACE, CDFW, and RWQCB have differing criteria for delineation of jurisdictional water features. The following sections describe the methods for delineation of jurisdictional limits for each agency.

Delineation of U.S. Army Corps of Engineers Jurisdictional Limits

ICF's and CALTRANS methods for delineating USACE jurisdictional features follow the guidelines set forth in the U.S. Army Corps of Engineers Wetlands Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Arid West Regional Supplement, USACE 2008). USACE takes jurisdiction over wetlands with connectivity to relatively permanent and traditionally navigable waterways, and over non-wetland waters including streambeds, rivers, and open water.

Three criteria normally must be fulfilled in order to classify an area as a jurisdictional USACE wetland: (1) a predominance of hydrophytic vegetation, (2) the presence of hydric soils, and (3) the presence of wetland hydrology. Details of the application of these techniques are described below.

Hydrophytic Vegetation. The hydrophytic vegetation criterion is satisfied at a location if greater than 50% of all the dominant species present within the vegetation unit have a wetland indicator status of obligate (OBL), facultative wetland (FACW), or facultative (FAC) (USACE 1987). An OBL indicator status refers to plants that have a 99% probability of occurring in wetlands under natural conditions. A FACW indicator status refers to plants that usually occur in wetlands (67 to 99% probability) but are occasionally found elsewhere. A FAC indicator status refers to plants that are equally likely to occur in wetlands or elsewhere (estimated probability 34 to 66% for each). The wetland indicator status used for this report follows the National List of Plant Species that Occur in Wetlands: California (Region 0) (USFWS 1988).

Hydric Soils. The hydric soil criterion is satisfied at a location if soils in the area can be inferred or observed to have a high groundwater table, if there is evidence of prolonged soil saturation, or if there are any indicators suggesting a long-term reducing environment in the upper 18 inches of the soil profile. Reducing conditions are most easily assessed using soil color. Soil colors were evaluated using Munsell Soil Color Charts.

Wetland Hydrology. The wetland hydrology criterion is satisfied at a location based upon conclusions inferred from field observations that indicate an area has a high probability of being inundated or saturated (flooded, ponded, or tidally influenced) long enough during the growing season to develop anaerobic conditions in the surface soil environment, especially the root zone.

Areas meeting all three of these parameters are generally designated as USACE wetlands.

The field guide describes physical evidence that should be used to ascertain the lateral limits of jurisdiction; generally more than one physical indicator or other means for determining the ordinary high water mark (OHWM) is used. The following physical indicators of OHWM were used in the field:

- Presence of litter and debris
- Wracking
- Bed and banks

When documenting the OHWM width within the stream, surveyors took measurements of stream width at various locations using a survey measuring tape. Distinct changes in channel width or riparian vegetation width were recorded.

Delineation of Regional Water Quality Control Board Jurisdictional Limits

The RWQCB jurisdiction generally follows the delineation of USACE jurisdictional wetland or non-wetland waters of the U.S. Since there is a presence of bed-and-bank OHWM and connectivity to a Relatively Permanent Water (RPW) and Traditional Navigable Water (TNW), the boundaries of the RWQCB jurisdiction will match that of USACE.

Delineation of California Department of Fish and Wildlife Jurisdictional Limits

Evaluation of California Department of Fish and Wildlife Code jurisdiction followed the guidance of related CDFW materials and standard practices by CDFW personnel. CDFW generally exerts jurisdiction over streambeds and to habitats adjacent to watercourses, such as willow woodlands that function hydrologically as part of the riparian system. CDFW jurisdiction was delineated by measuring outer boundaries of the greater of either the top of bank measurement (bank full width) or the extent of associated riparian or wetland vegetation.

Delineation of City of San Diego Jurisdictional Limits

The City of San Diego Municipal Code Section 113.0103 **(2013)** defines wetlands as areas characterized by any of the following conditions:

1. All areas persistently or periodically containing naturally occurring wetland vegetation communities characteristically dominated by hydrophytic vegetation, including but not limited to salt marsh, brackish marsh, freshwater marsh, riparian forest, oak riparian forest, riparian woodlands, riparian scrub, and vernal pools;
2. Areas that have hydric soils or wetland hydrology and lack naturally occurring wetland vegetation communities because human activities have removed the historic wetland vegetation or catastrophic or recurring natural events or processes have acted to preclude the establishment of wetland vegetation as in the case of salt pannes and mudflats;
3. Areas lacking wetland vegetation communities, hydric soils and wetland hydrology due to non-permitted filling of previously existing wetlands;
4. Areas mapped as wetlands on Map No. C-173 as shown in Chapter 13, Article 2, Division 6 (Sensitive Coastal Overlay Zone).

Jurisdictional delineations for the City of San Diego follow a 1-parameter rule (vegetation, soils, or hydrology) and will follow the same extents as CDFW jurisdictional habitat.

2.2.5. Bat Habitat Assessment

A diurnal bat survey had been previously conducted within the bat BSA (Figure 5) on April 17, 2009. The City requested that the bat habitat assessment be updated for this Project due to the 3-year lapse since the last studies had been performed. An updated bat habitat assessment and bat surveys were conducted in 2011 over the course of two site visits conducted on August 25 and September 2, 2011, both within the bat BSA.

The bat habitat assessment was conducted on August 25, 2011, and consisted of searching the El Camino Real Bridge for suitable roosting sites. The bridge was surveyed for bats or signs of bat use (guano, stains, insect parts, vocalizations). The search included crawling under the north and south buttresses, because these formed cave-like areas, and where the arches connected to the deck, forming 90 degree angles. Later that evening, an out-flight night survey was conducted of the bridge. On September 2, 2011, a day time survey of the central portion of the bridge was conducted. This consisted of surveying for bat activity.

2.2.6. Habitat Assessment for Belding's Savannah Sparrow

A habitat assessment for Belding's savannah sparrow was conducted within the general BSA (Figure 5) on April 18, 2009, and was updated on August 11, 2011. The general BSA was assessed for its potential to support this species.

2.2.7. Habitat Assessment for Southwestern Willow Flycatcher

A habitat assessment for southwestern willow flycatcher within the general BSA (Figure 5) was conducted on April 18, 2009, and was updated on August 11, 2011. The general BSA was assessed for its potential to support this species.

2.3. Personnel and Survey Dates

This section presents the survey dates, personnel, and other associated information for the biological surveys conducted by ICF in 2009 and 2011 in support of the Project as well as rare plant surveys conducted by AECOM for the W19 project in 2013, which includes the JPA mitigation area. Table 2-1 lists survey dates and personnel for the AECOM rare plant surveys. Table 2-2 lists survey dates, times, conditions, and personnel for ICF surveys. Resumes of Key Personnel are presented in Appendix L.

Table 2-1. AECOM Rare Plant Survey Dates and Personnel

Survey Date	Personnel	Survey Number
March 29, 2013	Jonathan Dunn, Fred Sproul, Lance Woolley	1
May 14, 2013	Jonathan Dunn, Lance Woolley	2
May 23, 2013	Fred Sproul, Lance Woolley	2
September 19, 2013	Jonathan Dunn, Fred Sproul, Lance Woolley	3

Table 2-2. ICF Survey Dates and Weather Conditions

Date	Personnel	Time	Conditions	Survey type
4/17/09	K. Fischer	0720–0755	63–65° F; wind 0–2 miles per hour (mph); 0% cloud cover (cc)	LBV[1] Survey #1
4/17/09	E. Eidson	0755–1230	63–68° F; wind 0–2 mph; 0% cc	Special-status Plant Survey #1

Table 2-2, continued

Date	Personnel	Time	Conditions	Survey type
4/17/09	D. Allen	1100–1200	63–68° F; wind 0–2 mph; 0% cc	Diurnal Bat Roost Survey
4/18/09	M. Alfaro	1500–1600	72° F; wind 0–2 mph; sunny skies	SWFL[2] and BSS[3] Habitat Assessment
4/27/09	M. Alfaro	0850–0950	68° F; wind 0–2 mph; 100% cc	LBV Survey #2
5/9/09	M. Alfaro	0810–0920	69° F; wind 0–2 mph; 100% cc	LBV Survey #3
5/19/09	E. Eidson	0845–0945	67° F; wind 0–2 mph; hazy skies	LBV Survey #4
5/19/09	E. Eidson	0945–1200	70° F; wind 0–2 mph; hazy skies	Special-status Plant Survey #2
5/30/09	M. Alfaro	0820–0930	69° F; wind 0–2 mph; 100% cc	LBV Survey #5
6/9/09	K. Fischer	0635–0735	62° F; wind 0–2 mph; 100% cc	LBV Survey #6
6/23/09	E. Eidson	0845–0945	65–68° F; wind 0 mph; 100% cc	LBV Survey #7
7/20/09	E. Eidson	1000–1100	78–80° F; wind 0-5 mph; clear skies	LBV Survey #8
8/21/09	E. Eidson	0945–1245	75–80° F; wind 2–5 mph; hazy skies	Special-status Plant Survey #3
8/25/09	A. Borcher	0800–1600	80–84° F; wind 0–5 mph; clear skies	Jurisdictional Delineation
/26/09	A. Borcher	0800–1530	79–83° F; wind 0–5 mph; clear skies	Jurisdictional Delineation
1/3/10	E. Eidson	0830–1130	66–70° F; wind 0–5 mph; clear skies	Vegetation Mapping of Roundabout Areas
8/11/11	E. Eidson K. Fischer	0830–1430	70–75° F; wind 0–3 mph; overcast to 50% cc	Update vegetation mapping, Habitat Assessments, Special-status Plant Habitat Assessment
8/16/11	D. Ritenour	1100–1630	65–74° F, wind 0–5 mph, clear skies	Jurisdictional Delineation
8/25/11	D. Allen	1800–2030	79–73° F; wind 0–1 mph; no cloud cover	Nocturnal Bat Habitat Assessment
9/2/11	D. Allen	1100–1215	68° F, wind 1–2 mph; clear skies	Diurnal Bat Habitat Assessment
1/26/12	D. Ritenour	1200–1400	70–74° F, wind 0–5 mph, clear skies	Jurisdictional Delineation of JPA mitigation area

[1] LBV = Least Bell's vireo
[2] SWFL = Southwestern willow flycatcher
[3] BSS = Belding's savannah sparrow

2.4. Agency Coordination and Professional Contacts

A summary of consultation with the resources agencies is provided in Appendix M and pertinent consultations are presented here. Informal consultation with the USFWS and CDFW was initiated previously by the City due to the presence of light-footed clapper rail, a federally and state endangered species and a state Fully Protected Species. CDFW and USFWS were involved in multi-agency coordination meetings held in 2005. In 2006, CDFW and USFWS issued a joint comment letter on the 2006 Draft EIR for the Project. That letter included specific concerns regarding potential Project impacts to light-footed clapper rail and other biological resources. In a meeting held September 26, 2012 with the City of San Diego and consultants, CDFW, USFWS, USACE and RWQCB, the issues brought forth in the 2006 letter were reiterated. It was requested that these issues be specifically addressed in the project NES and EIR. Accordingly, these issues are addressed in this NES. Further consultation with the wildlife agencies under FESA may be required in order to appropriately address potential Project impacts to listed species (including indirect impacts to the light-footed clapper rail) and minimization/mitigation measures.

In April 2014, SANDAG solicited the resource agencies, including CDFW, USFWS, USACE, RWQCB and the California Coastal Commission, to allow for mitigation for impacts to existing, degraded wetland habitats used as mitigation for the North Coast Corridor project impacts at a 1:1 ratio as these habitats would be converted to higher value wetlands. In a series of emails, all resource agencies agreed. Mitigation for the El Camino Real Bridge Replacement Project on the JPA mitigation site is being conducted by SANDAG in association with the City of San Diego under a memorandum of agreement. Thus, the 1:1 mitigation ratio applies to the JPA mitigation site.

The USFWS publishes on-line lists of species of concern that may occur within areas of proposed projects. The list for projects in the vicinity of the El Camino Real Bridge Replacement Project is included in Appendix C Regional Species and Habitats of Concern. There are 19 species of USFWS concern that may occur in the area. The potential for these species, and other species and habitats of regional concern, to occur in the project area are addressed in Appendix C. Permit application will be required for impacts to jurisdictional areas. Coordination with agencies such as USACE, CDFW, California Coastal Commission (CCC) and RWQCB will be required. At this time, no permit applications have been submitted.

The Jurisdictional Delineation report will be submitted to USACE to obtain concurrence on the delineation that was prepared for the proposed Project.

2.5. Limitations That May Influence Results

The Project includes areas under private ownership, including the Rancho Del Mar property (Figure 5). Because access to this property was not granted by the property owner, data collected for this area was completed from within City property or existing access easements; no studies were conducted within the portion of the BSA situated in the Rancho Del Mar property.

All site visits were conducted during daylight hours, with the exception of a single nocturnal bat survey, which was conducted within the bat BSA. As a result nocturnal and crepuscular wildlife species occurring in the BSA may not have been detected even if present. Thus, despite repeated general and focused surveys of wildlife within the BSA conducted over the time frame of several years, animal species diversity within the BSA is possibly greater than observed. In particular, some species of herpetofauna, mammals and migratory birds may have been missed. No other limitations that might influence the results of the biological resource work were experienced.

Chapter 3. Results: Environmental Setting

3.1. Description of the Existing Biological and Physical Conditions

The following section addresses general conditions and biological resources observed in the general BSA (Figure 5). The BSA comprises the proposed limits of disturbance for all four alternatives, the JPA mitigation area and the portions of the proposed staging areas that will be permanently impacted by road widening. The entire BSA was surveyed in order to assess and record the existing biological and physical conditions.

3.1.1. Study Area

The BSA is situated partially within the Northern Area of the MHPA established by the City's subarea plan (Figure 3). A portion of the BSA situated west of El Camino Real and another portion situated south of El Camino Real and south of San Dieguito Road occur within the MHPA. In addition, habitats occurring west of El Camino Real are situated within the City of San Diego Coastal Overlay Zone. Regionally, the Project site is situated in the San Dieguito River floodplain. The Project alignment extends across the floodplain of the San Dieguito River and is generally flat with the exception of the river bed. The San Dieguito River channel east of the bridge is fortified with quarter-ton rip rap while the channel west of the bridge consists of a sandy substrate.

Three constructed drainage channels occur in the vicinity of the BSA. Two of the drainage channels parallel Via de la Valle; one is situated to the north and the other to the south. Another drainage channel parallels the eastern side of El Camino Real.

A small portion of the proposed mitigation site for the constructed Fairbanks Ranch Project occurs within the BSA. However, because this project's mitigation effort was never implemented, impacts to these areas are not assessed as impacts to a mitigation site. Impacts occurring within the boundaries of these proposed mitigation areas are called out separately in this report. The mitigation site consists of two areas situated east of the existing bridge. One of the sites occurs immediately south of the river, 0.1 ac, and the other occurs immediately north of the river, 0.4 ac.

Surrounding land uses north of the existing bridge include an equestrian center, commercial area, and recreational fields. South of the bridge, a golf course exists on the eastern side of the road and fallow agricultural fields exist to the west.

3.1.2. Physical Conditions

Elevation in the BSA is approximately 20 ft above mean sea level (MSL) but drops between 5 and 10 ft from the existing roadbed to the adjacent habitat. Elevation at the San Dieguito River bottom is approximately 5 ft above MSL.

The following four soil series are reported as occurring within the BSA: Tujunga series, Grangeville series, Huerhuero series, and Corralitos series (NRCS 2011, USDA 1973). The soil series and specific soil types are described in detail below.

The Tujunga series consists of very deep excessively drained sands derived from granitic alluvium. These soils are found on alluvial fans and flood plains and have slopes of 0 to 5%. Tujunga sand, 0 to 5% slopes, occurs along the alluvial valley bottom within the BSA.

The Grangeville series consists of somewhat poorly drained, very deep fine sandy loams derived from granitic alluvium. These soils are on alluvial fans and alluvial plains, and have slopes of 0 to 2%. Grangeville fine sandy loam, 0 to 2% slopes, occurs in the northern and southern portions of the BSA.

The Huerhuero series consists of moderately well-drained loams that have a clay subsoil. These soils developed in sandy marine sediments and have slopes of 2 to 30%. Huerhuero loam, 15 to 30% slopes, is reported from the southernmost portion of the BSA.

The Corralitos series consists of somewhat excessively drained, very deep loamy sands that formed in alluvium derived from marine sandstone. These soils are typically found in narrow valleys and on small alluvial fans, and have slopes of 0 to 15%. Corralitos loamy sand, 0 to 5% slopes and Corralitos loamy sand, 5 to 9% slopes occur along the northern portion of the BSA.

3.1.3. Biological Conditions in the Biological Study Area

3.1.3.1. VEGETATION COMMUNITIES

A total of 18 vegetation communities and land cover types are present within the BSA: disturbed southern willow scrub, mule-fat scrub, disturbed mule-fat scrub, coastal freshwater marsh, disturbed coastal freshwater marsh, disturbed coastal brackish marsh, alkali marsh, disturbed southern coastal salt marsh, disturbed wetland, disturbed Diegan coastal sage scrub – coastal form, Disturbed coastal sage scrub – Baccharis dominated, tamarisk scrub non-native grassland, disturbed areas, eucalyptus woodland, ornamental, bare ground, and developed areas. All vegetation communities and land cover types are described below, summarized in Table 3-1, and depicted in Figures 6a-6e.

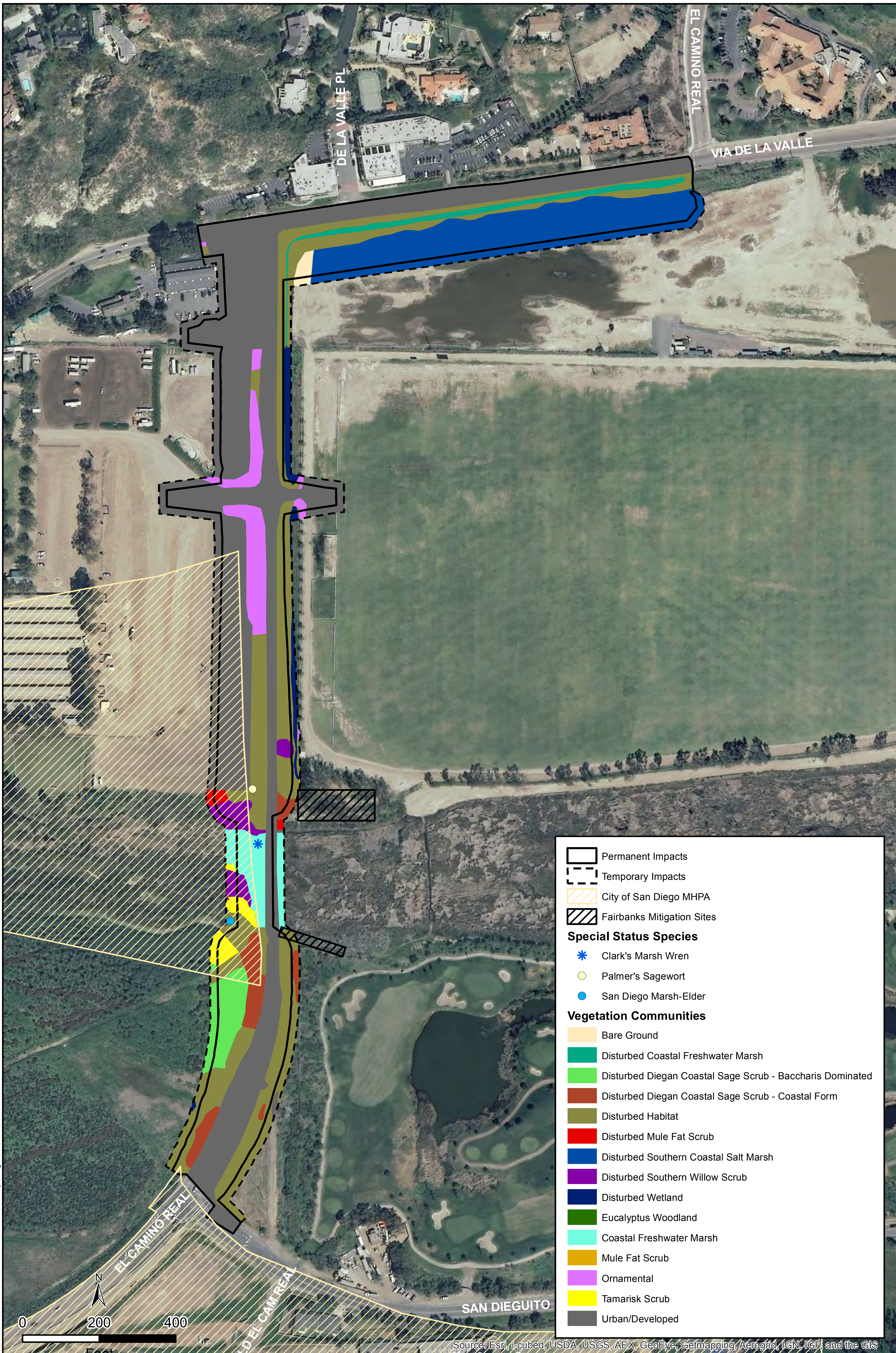

Figure 6a
Biological Resources Western Alternative
El Camino Real Bridge Replacement Project

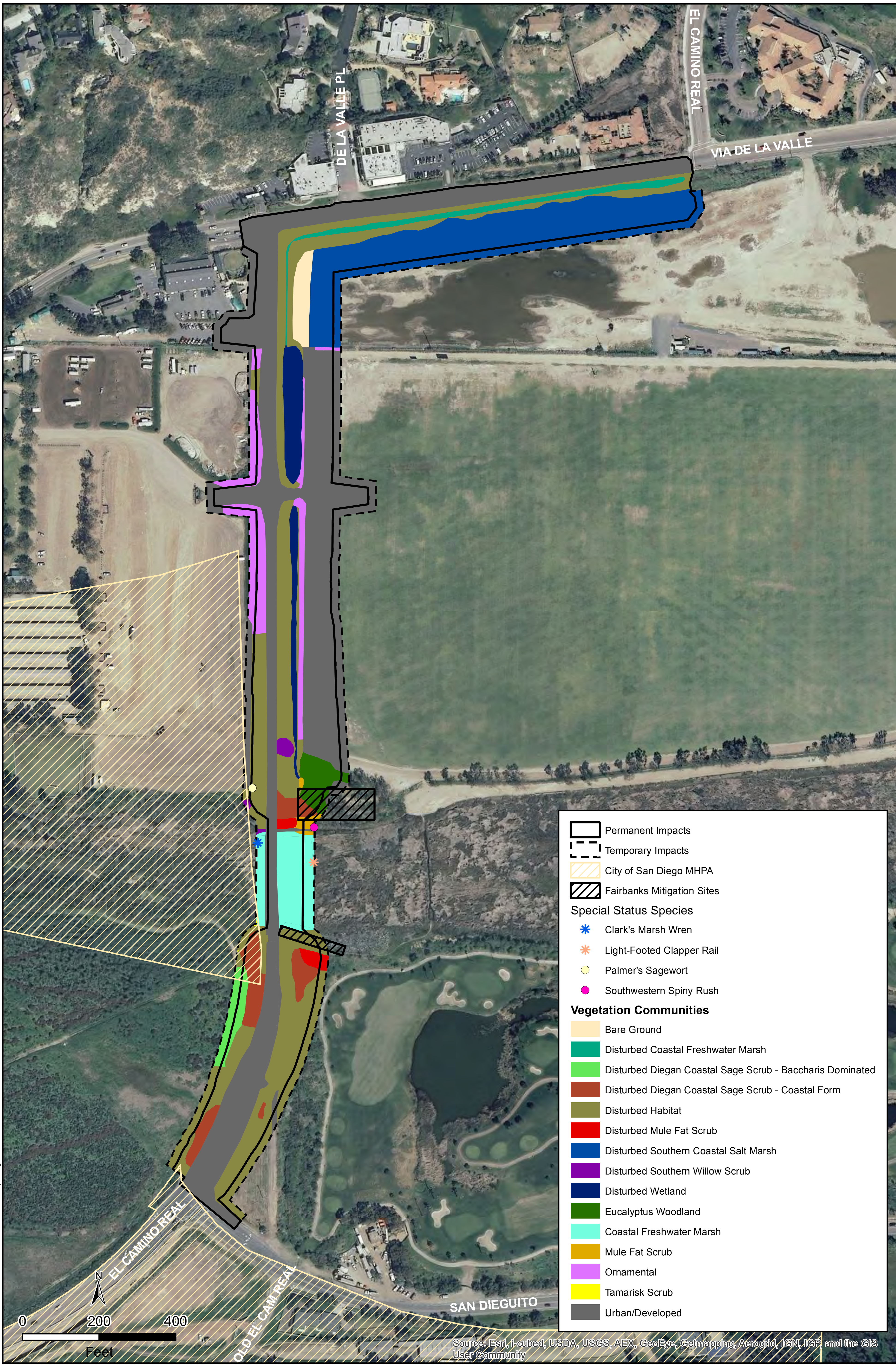

Figure 6b
Biological Resources Central Alternative
El Camino Real Bridge Replacement Project

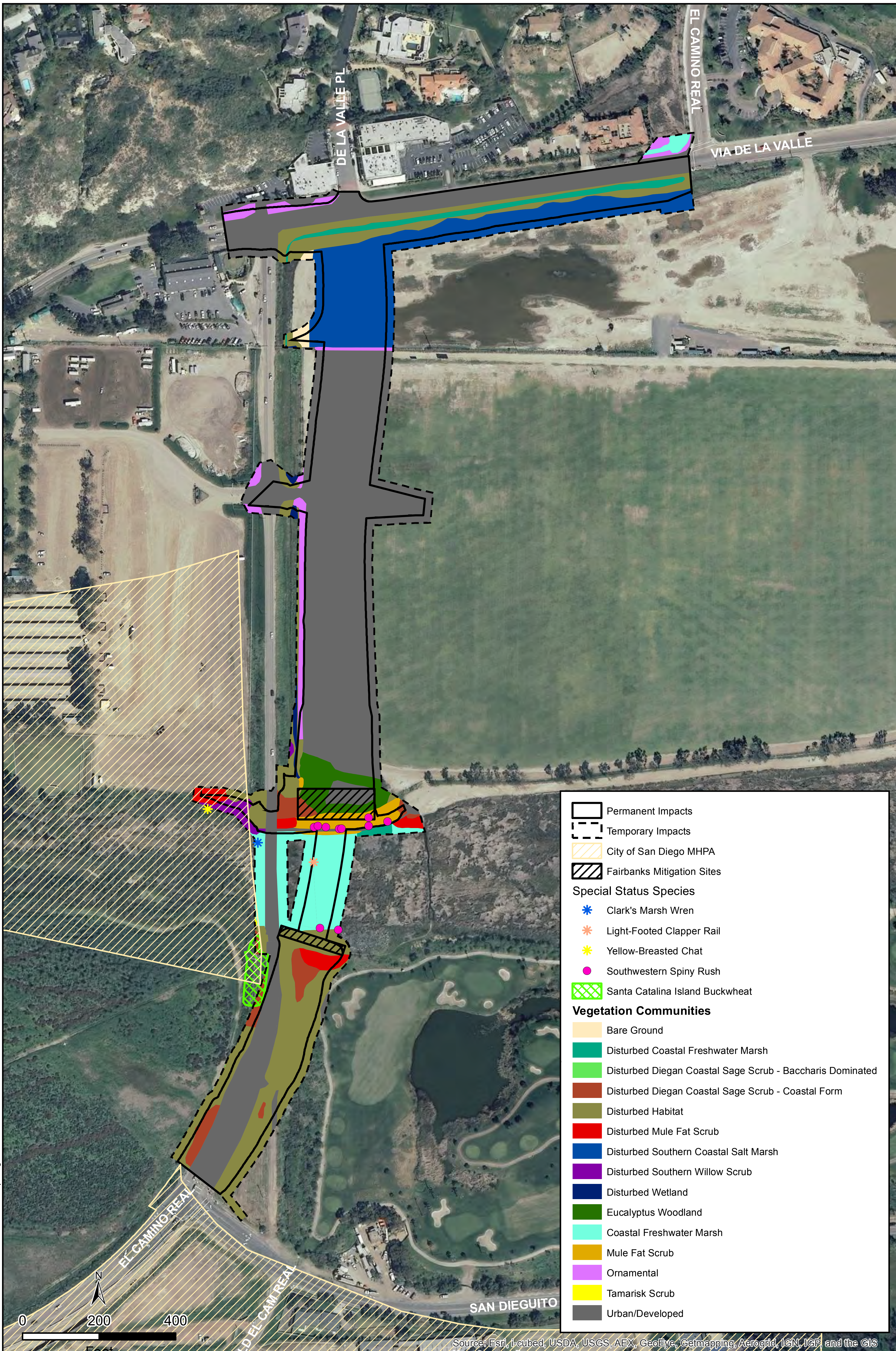

Figure 6c
Biological Resources Eastern Alternative
El Camino Bridge Replacement Project

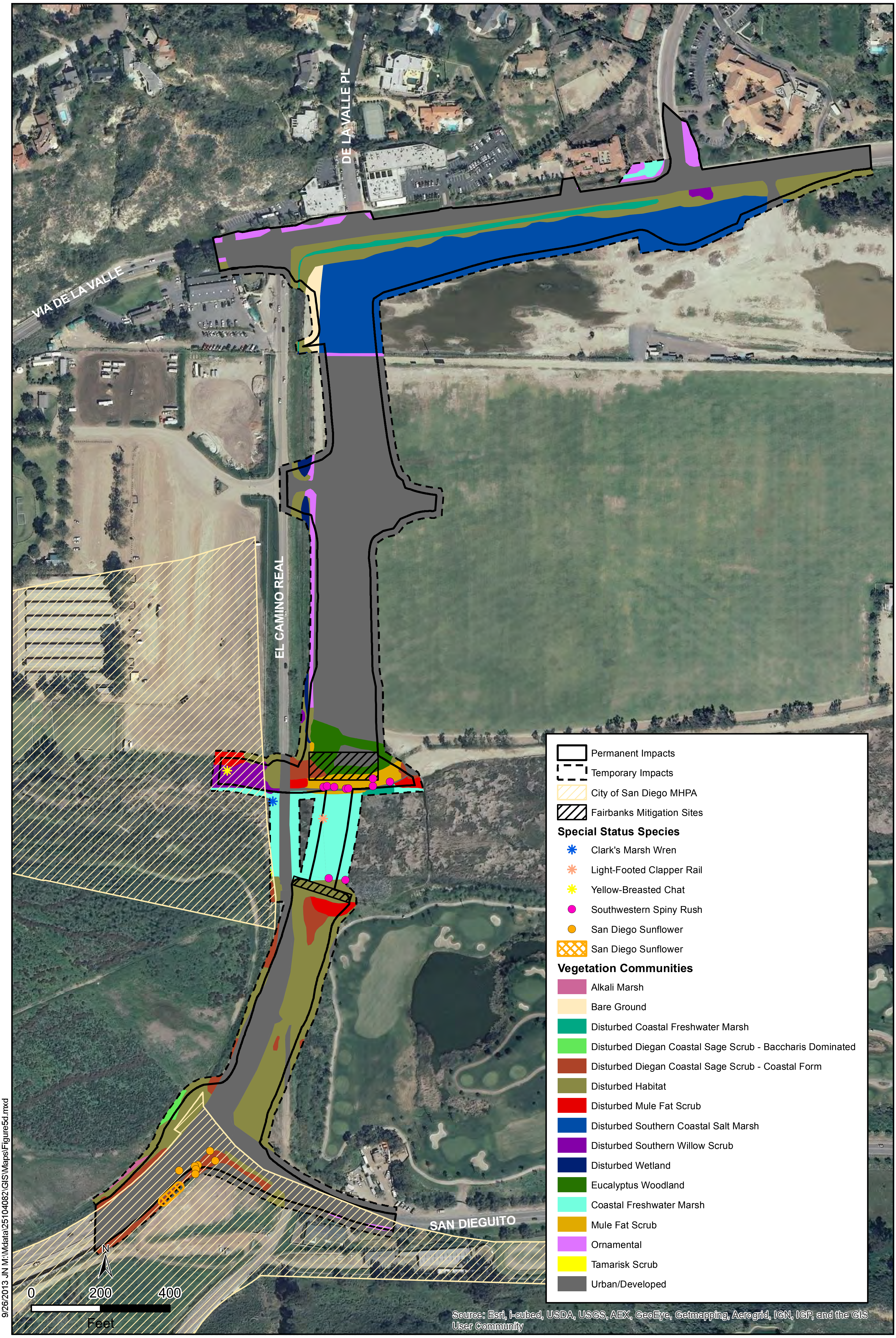

Figure 6d
Biological Resources Roundabout Alternative
El Camino Bridge Replacement Project

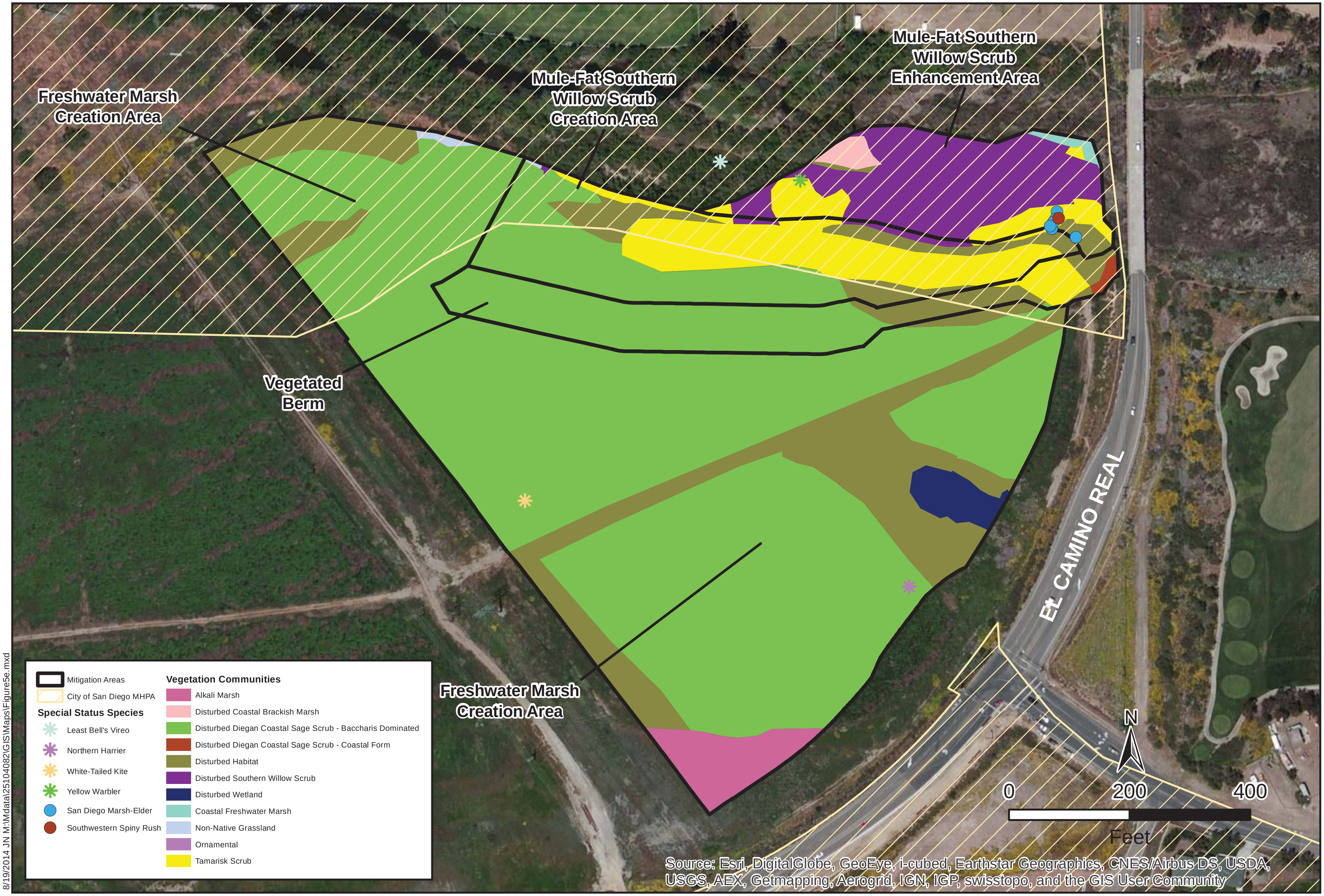

Figure 6e
Biological Resources JPA Mitigation Area
El Camino Real Bridge Replacement Project

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Table 3-1. Vegetation Communities and Land Cover Types

Vegetation Community (Oberbauer et al. 2008 Code)	Acreage
Disturbed southern willow scrub (63320)	1.85
Mule-fat scrub (63310)	0.30
Disturbed mule-fat scrub (63310)	0.25
Coastal freshwater marsh (52410)	1.59
Disturbed coastal freshwater marsh (52410)	0.39
Disturbed coastal brackish marsh (52200)	0.08
Disturbed southern coastal salt marsh (52120)	4.11
Alkali marsh (52300)	0.48
Disturbed wetland (11200)	0.83
Disturbed Diegan coastal sage scrub – coastal form(32510)	0.97
Disturbed Diegan coastal sage scrub – Baccharis dominated (32520)	14.77
Tamarisk scrub (63810)	1.69
Non-native grassland	0.04
Disturbed Land (11300)	9.24
Eucalyptus woodland (11100)	0.42
Ornamental (11000)	1.31
Bare ground	0.23
Urban/Developed (12000)	17.12
Total	**55.78**

Disturbed Southern Willow Scrub (63320)

Southern willow scrub is described as dense, broad-leafed, winter-deciduous riparian thicket dominated by several willow (*Salix*) species with scattered western cottonwood (*Populus fremontii*) and western sycamore (*Platanus racemosa*). Most stands are too dense to allow an understory to develop. This vegetation community is typically found on loose, sandy, or fine gravelly alluvium deposited near stream channels (Oberbauer et al. 2008). The abundance of nonnative species is the characteristic that distinguishes disturbed southern willow scrub from undisturbed southern willow scrub. In the BSA, plants detected in disturbed southern willow scrub included arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), narrow-leaf willow (*Salix exigua*), mule-fat, tamarisk (*Tamarix ramosissima*), San Diego marsh-elder (*Iva hayesiana*), saltgrass (*Distichlis spicata*) and black mustard (*Brassica nigra*). A few individuals of pacific pickleweed (*Salicornia pacifica*) and fleshy jaumea (*Jaumea carnosa*) occur within disturbed southern willow scrub as remnants of areas that previously supported coastal brackish marsh. A total of 1.85 ac of disturbed southern willow scrub occur in the BSA.

Mule-Fat Scrub (63310)

Mule-fat scrub is described as a depauperate, tall, herbaceous riparian scrub strongly dominated by mule-fat. This early seral community is maintained by frequent flooding. It is usually found in intermittent stream channels with fairly coarse substrate and moderate depth to the water table (Oberbauer et al. 2008). Mule-fat scrub in the BSA is predominated by mule-fat. A total of 0.30 ac of mule-fat scrub occurs in the BSA.

The abundance of nonnative shrub species not typically associated with mule-fat scrub is the characteristic that distinguishes disturbed mule-fat scrub from undisturbed mule-fat scrub. Plant species detected in disturbed mule-fat scrub occurring along the San Dieguito River included mule-fat, tamarisk, arroyo willow, yerba mansa (*Anemopsis californica*), southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*), chaparral broom (*Baccharis pilularis*), broom baccharis (*Baccharis sarothroides*), and tree tobacco (*Nicotiana glauca*). Patches of disturbed mule-fat scrub also occur within the JPA mitigation area. These patches are predominated by mule-fat, tree tobacco, broom baccharis, and chaparral broom. A total of 0.25 ac of disturbed mule-fat scrub occurs in the BSA.

Coastal Freshwater Marsh (Holland Code 52410)

Coastal freshwater marsh is dominated by perennials and emergent monocots up to 4–5 meters (m) (13 to 16 ft) tall, often forming completely closed canopies. Freshwater marsh habitats are found in areas permanently flooded by fresh water, and lacking significant current from water flow. Prolonged saturation in these types of habitats allows for the accumulation of deep, peaty soils (Oberbauer et al. 2008). Coastal freshwater marsh in the BSA is predominated by southern cattail (*Typha domingensis*), willow dock (*Rumex salicifolius*), saltgrass, curly dock (*Rumex crispus*), common sow-thistle (*Sonchus oleraceus*), salt heliotrope (*Heliotropium curassavicum*), and southwestern spiny rush. Portions of the San Dieguito River currently supporting coastal freshwater marsh previously supported coastal brackish marsh, as reported in the 2006 NES (Tierra 2006). A few individuals of Pacific pickleweed occur along the periphery of coastal freshwater marsh as remnants of coastal brackish marsh previously occurring in this area. A total of 1.59 ac of coastal freshwater marsh occur in the BSA.

The abundance of nonnative plant species and a high level of disturbance are the main characteristics that distinguish disturbed coastal freshwater marsh from undisturbed coastal freshwater marsh. Disturbed coastal freshwater marsh occurs in a small area in the San Dieguito River and also along two drainages parallel to Via de la Valle. In the BSA disturbed coastal freshwater marsh is predominated by southern cattail, curly dock, common celery (*Apium graveolens*), telegraph weed (*Heterotheca grandiflora*), Bermuda grass (*Cynodon dactylon*), California bulrush (*Schoenoplectus californicus*), Boccone’s sand-spurry (*Spergularia bocconi*), and pampas grass (*Cortaderia selloana*). A total of 0.39 ac of disturbed coastal freshwater marsh occurs within the BSA.

Disturbed Coastal Brackish Marsh (52200)

Coastal brackish marsh is typically dominated by perennial, herbaceous monocots that grow to 2 m tall. This vegetation community supports plant species typical of both salt marsh and freshwater marsh (Oberbauer et al. 2008). The abundance of nonnative species and the evidence of human disturbance are the characteristics that distinguish disturbed coastal brackish marsh from undisturbed coastal brackish marsh. In the BSA, disturbed coastal brackish marsh is predominated by annual beard grass (*Polypogon monspeliensis*), Bermuda grass, fleshy jaumea, pacific pickleweed, yerba mansa, arrow weed (*Pluchea sericea*), saltgrass, and common celery. This vegetation community occurs as a small patch that is a remnant of the more expansive area of coastal brackish marsh that previously occurred in this area (Tierra 2006). A total of 0.08 ac of disturbed coastal brackish marsh occurs within the BSA.

Disturbed Southern Coastal Salt Marsh (52120)

Southern coastal salt marsh typically occurs along sheltered inland margins of bays, lagoons, and estuaries that are subject to regular tidal inundation by salt water for at least part of the year. This vegetation community is comprised of herbaceous and suffructescent, salt-tolerant hydrophytes (Oberbauer et al. 2008). Plant species detected in the BSA included alkali weed (*Cressa truxillensis*), salt grass, pacific pickleweed, five-hook bassia (*Bassia hyssopifolia*), salt heliotrope, alkali-heath (*Frankenia salina*), and bush seepweed (*Suaeda nigra*). Two areas of disturbed costal salt marsh occur in the BSA. One area is situated south of Villa de la Valle and north of the polo field. This area is flat and is used as a parking area for certain events at the polo field. This area becomes inundated during rain events. The second area occurs in the JPA mitigation area. A total of 4.11 ac of disturbed southern coastal salt marsh occur within the BSA.

Disturbed Wetland (11200)

Disturbed wetland describes an area supporting a composition of obligate hydrophytes that are predominantly non-native (Oberbauer et al. 2008). Disturbed wetlands are typically in areas that historically supported wetland habitat and are currently subject to a high level of disturbance. Plant species detected on site included curly dock, annual beard grass, Bermuda grass, and salt grass. This vegetation community is situated within a portion of the JPA mitigation area that was not previously involved in active agriculture. This vegetation type also occurs along a drainage west of the San Diego Polo Club, parallel to El Camino Real. The drainage situated west of the polo field is mowed regularly by the property owner. Therefore, the presence and abundance of wetland vegetation varies and is not always easily detectable. A total of 0.83 ac of disturbed wetland occurs within the BSA.

Alkali Marsh (52300)

Alkali marsh is similar to coastal brackish marsh with many of the same species (Oberbauer et al. 2008). This habitat persists where saturated soils are present for all or a portion of the year. Plant species detected on-site were heavily dominated by alkali weed (*Cressa truxillensis*) with occasional bush seepweed (*Suaeda nigra*). This vegetation community is situated within a portion of the JPA mitigation area that was not previously involved in active agriculture. A total of 0.48 ac of alkali marsh occurs within the BSA, all pf which is located on the JPA mitigation site.

Disturbed Diegan Coastal Sage Scrub – Coastal Form (32520)

Diegan coastal sage scrub – coastal form, a City of San Diego Tier II habitat type, is found in coastal areas from Los Angeles County south into Baja California. Oberbauer et al. (2008) describes this vegetation community as being comprised of low-growing, aromatic, drought-deciduous, soft-woody shrubs that have an average height of 3 to 4 ft. Typically, this community is found on sites with steep, dry slopes or on clay-rich soils that are slow to release stored water. The sparse distribution of the shrub species typically dominant in this vegetation community, as well as the abundance of nonnative species, are the characteristics that distinguish disturbed Diegan coastal sage scrub from undisturbed Diegan coastal sage scrub. In the BSA, this vegetation community occurs along El Camino Real and in a strip between El Camino Real and the golf course. Dominant species included California encelia (*Encelia californica*), coastal sagebrush (*Artemisia californica*), Santa Catalina Island buckwheat (*Eriogonum giganteum* var. *giganteum*), goldenbush (*Isocoma menziesii*), crown daisy (*Glebionis coronaria*), black mustard, and jimson weed (*Datura wrightii*). Areas of disturbed Diegan coastal sage scrub occurring east of El Camino Real and south of San Dieguito Road support San Diego sunflower (*Bahiopsis laciniata*). A total of 0.97 ac of disturbed Diegan coastal sage scrub occur within the BSA.

Disturbed Diegan Coastal Sage Scrub – Baccharis Dominated (32530)

Diegan coastal sage scrub – Baccharis dominated is similar to Diegan coastal sage scrub – coastal form but dominated by Baccharis species (Oberbauer et al. 2008). It typically occurs on disturbed or nutrient poor soils. It is often found with other forms of Diegan coastal sage scrub and on the terraces of river valleys. Characteristic species include *Baccharis sarothroides* and *B. pilularis*. The high percentage of cover contributed by non-native species distinguishes the disturbed form of this community from the undisturbed form. Non-native species occurring tin this vegetation community in high densities include tree tobacco (*Nicotiana glauca*) and five-hook bassia (*Bassia hyssopifolia*) and In the BSA, this vegetation community is the dominant community that has developed in the abandoned agricultural fields that comprise the JPA mitigation area. A total of 14.3 acres of Diegan coastal sage scrub – Baccharis dominated occur in the BSA.

Non-native Grassland (42200)

Non-native grassland , a City of San Diego Tier III B common upland habitat, is typified by the presence of dense to sparse cover by annual grasses with flowering culms 0.2 to 0.5 (1.0) m high (Oberbauer et al. 2008). In San Diego County, the presence of *Avena*, *Bromus*, *Erodium* and *Brassica* are common indicators. In the BSA, this vegetation community exists as a small (0.04 ac), isolated patch of habitat at the northwest boundary of the JPA mitigation area. The dominant species observed was ripgut brome (*Bromus diandrus*). Non-native grassland can be an important habitat to small mammals and raptors that feed on them.

Tamarisk Scrub (63810)

Tamarisk scrub describes an area predominated by tamarisk, an invasive nonnative tree species. This vegetation community typically occurs on sandy or gravelly braided washes or intermittent streams, often in areas where high evaporation increases the area's salinity. Within the BSA, tamarisk scrub occurs along the San Dieguito River and is predominated by tamarisk, although it also supports scattered willow species and mule-fat. A total of 0.1.69 ac of tamarisk scrub occurs within the BSA.

Disturbed Land (11300)

Disturbed areas are a City of San Diego Tier IV habitat type. These types of areas are currently or were previously subject to high levels of disturbance and are consequently dominated by nonnative plant species. Within the BSA, disturbed areas occur south of the San Dieguito River within the JPA mitigation area and as a narrow strip south of Via de la Valle. Plants occurring in disturbed areas within the JPA mitigation area included five-hook bassia, tree tobacco, tomato (*Lycopersicon* sp.), New Zealand spinach (*Tetragonia tetragonioides*), common knotweed (*Polygonum aviculare depressum*), salt heliotrope, mule-fat, chaparral broom, and cheeseweed (*Malva parviflora*). Disturbed land occurring along Via de la Valle and along El Camino Real is predominated by five-hook bassia, pampas grass, tree tobacco, and crown daisy. A total of 9.24 ac of disturbed land occur within the BSA.

Eucalyptus Woodland (11100)

Eucalyptus woodland, a City of San Diego Tier IV habitat type, typically consists of monotypic stands of eucalyptus (*Eucalyptus* sp.) trees with little vegetation in the understory. Within the BSA, eucalyptus woodland is predominated by eucalyptus trees with scattered ripgut grass in the understory. A total of 0.42 ac of eucalyptus woodland occurs within the BSA.

Ornamental (11000)

Ornamental, a City of San Diego Tier IV habitat type, describes areas that have been landscaped by the City and/or property owners and support nonnative, cultivated vegetation. Plant species occurring in ornamental vegetation included Hottentot fig (*Carpobrotus edulis*), evergreen pear (*Pyrus kawakanii*), American century plant (*Agave americana*), Canary Island date palm (*Phoenix canariensis*), queen palm (*Syagrus romanzoffiana*), and lawns. A total of 1.31 ac of ornamental vegetation occur within the BSA.

Bare Ground

Bare ground describes an area where soils are so compacted that vegetation will not grow. A total of 0.23 ac of bare ground occurs within the BSA.

Urban/Developed (12000)

Urban/developed areas on the Project site consist of Via de la Valle and El Camino Real, and their rights-of-way, the golf course, and the polo field. Paved areas, such as existing roads and their rights-of-way, do not provide habitat for wildlife or plant species. Although the golf course and the polo field are not paved, vegetation occurring in these areas consists of lawns and ornamental areas that are maintained regularly and, thus, do not provide suitable habitat for wildlife or native plant species. A total of 17.19 ac of developed areas occur within the BSA.

3.1.3.2. PLANT SPECIES

A total of 99 plant species were detected within the BSA. A complete list of plant species detected is provided in Appendix A.

3.1.3.3. WILDLIFE SPECIES

A total of 55 wildlife species were detected within the BSA. A complete list of the wildlife species detected is provided in Appendix B. Wildlife species observed regularly within the BSA are listed below.

Bird species most commonly detected within the BSA included: mallard (*Anas platyrhynchos*), American kestrel (*Falco sparverius*), mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), western scrub-jay (*Aphelocoma californica*), northern rough-winged swallow (*Steigidopteryx serripennis*), cliff swallow (*Petrochelidon pyrrhonota*), bushtit (*Psaltriparus minimus*), common yellowthroat (*Geothlypis trichas*), California towhee (*Melozone crissalis*), song sparrow (*Melospiza melodia*), great-tailed grackle (*Quiscalus mexicanus*), brown-headed cowbird (*Molothrus ater*), house finch (*Carpodacus mexicanus*), and lesser goldfinch (*Carduelis psaltria*).

Mammals detected included desert cottontail (*Sylvilagus audubonii*), California ground squirrel (*Spermophilus beecheyi*), and Botta's pocket gopher (*Thomomys bottae*). Indicators, such as tracks and scat, were used to determine the occurrence of coyote (*Canis latrans*) and bobcat (*Lynx rufus*) within the BSA. Western fence lizard (*Sceloporus occidentalis*) and southern Pacific rattlesnake (*Crotalus helleri*) were the only reptiles detected within the BSA.

3.1.3.4. Wildlife Movement Corridors

Wildlife movement corridors are defined as areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Natural features such as canyon drainages, ridgelines, or areas with vegetation cover provide corridors for wildlife travel. Wildlife movement corridors are important because they provide access to mates, food, and water; allow the dispersal of individuals away from high population density areas; and facilitate the exchange of genetic traits between populations (Beier and Loe 1992). Wildlife movement corridors are considered sensitive by resource and conservation agencies.

Along the San Dieguito River channel, riparian scrub and freshwater marsh habitats support a diverse wildlife population. A contiguous band of habitat occurring along the river functions as part of a regional, east/west-trending wildlife corridor. Federally and state-endangered species, including light-footed clapper rail and least Bell's vireo, are known to utilize the wetland habitats in the BSA.

The portion of the San Dieguito River occurring within the BSA is bounded by a fallow agricultural field (the JPA mitigation area) to the southwest, horse stables to the northwest, a polo field to the northeast, and a golf course to the southeast. However, the San Dieguito River offers sufficient vegetative cover for wildlife species to move through this area.

3.1.3.5. Invasive Species

During the general fieldwork and focused studies, plant species lists were compiled. A complete list of plants species observed during the current fieldwork is provided in Appendix A. Included in the floral list are species classified as invasive to natural communities. Such species invade natural communities throughout California, and these species can replace native habitat needed by wildlife, increase wildfire and flood danger, and destroy productive range and timberlands. Roads, highways, and related construction projects are some of the principal dispersal vectors for invasive plant species.

Following the California Invasive Plant Council (Cal-IPC) (Cal-EPPC 1999) classification, 29 of the 99 species of plants observed within the Project study area are classified as invasive plant species. The invasive species detected in the BSA are listed in Table 3-2.

Table 3-2. Noxious Weeds within the Biological Study Area

Scientific Name	Common Name	Cal-IPC[1]
Atriplex semibaccata	Australian Saltbush	BBB
Bassia hyssopifolia	Five-Hook Bassia	CCB
Brassica nigra	Black Mustard	BBA
Bromus diandrus	Ripgut Brome	BBA
Bromus hordeaceus	Soft chess	BCA
Carpobrotus chilensis	Sea-fig	BBA
Carpobrotus edulis	Hottentot fig	ABA
Cortaderia selloana	Pampas Grass	AAB
Cynara cardunculus	Artichoke thistle	BBB
Cynodon dactylon	Bermuda grass	BBB
Foeniculum vulgare	Sweet Fennel	ABA
Glebionis coronaria	Crown daisy	BBB
Helminthotheca echioides	Bristly ox-tongue	CBB
Hirschfeldia incana	Short-podded mustard	BBA
Lepidium latifolium	Broad-Leaved Peppergrass	AAA
Lolium multiflorum	Italian Ryegrass	ABA
Medicago polymorpha	Castor bean	CCA
Myoporum laetum	Ngaio	BBB
Nicotiana glauca	Tree tobacco	BBB
Phoenix canariensis	Canary Island date palm	CBD
Polypogon monspeliensis	Annual beard grass	CCB
Raphanus sativus	Wild radish	CCB
Ricinus communis	Castor Bean	CBB
Rumex crispus	Curly dock	CCA
Salsola tragus	Prickly Russian-Thistle	CBB
Sisymbrio irio	London rocket	BBA
Tamarix ramosissima	Tamarisk	AAA
Tetragonia tetragonioides	New Zealand Spinach	CCC
Washingtonia robusta	Mexican fan palm	BBC

[1] Codes (California Invasive Plant Council 2006):
Impact/Invasiveness/Distribution: A= Severe; B = Moderate; C = Limited; D = None

3.2. Regional Species and Habitats of Concern

Plant and wildlife species are considered to have special status if they have been listed as such by federal or state agencies or by special interest groups, such as the CNPS (CNPS 2011). The CDFW publishes separate comprehensive lists for plants and animals through the CNDDB (CDFG 2011a, 2011b). These include taxa officially listed by the state and federal governments as Endangered, Threatened, or Rare, and candidates for state or federal listing. The City also considers a list of narrow endemic plant species as sensitive biological resources. In addition, habitats that support a listed species, wetlands, and wetland buffers are also considered to be sensitive biological resources.

The USFWS publishes on-line lists of species of concern that may occur within areas of proposed projects. The list for projects in the vicinity of the El Camino Real Bridge Replacement Project is included in Appendix C Regional Species and Habitats of Concern. There are 19 species of USFWS concern that may occur in the area. The potential for these species, and other species and habitats of regional concern, to occur in the project area are addressed in Appendix C. There are 86 special-status plant species, 14 special-status wildlife species, and 12 sensitive natural vegetation communities known to occur within the region. A list of these species and vegetation communities, as well as their requirements and likelihood of occurrence within the BSA, is provided in Appendix C. A review of special-status species, sensitive natural vegetation communities, and other natural resources that are present in the BSA is presented in Chapter 4.

As stated in Section 2.1.3.1, the Project lies within the boundaries of the City of San Diego Multiple Species Conservation Program Subarea and a portion of the Project lies within the Multi-Habitat Preserve Area. Species covered by the MSCP that were observed in the Project area are presented in Section 5.15.1. All sensitive plant and animal species that might occur in the Project area, including all MSCP covered species and City of San Diego narrow endemic species, are presented in Appendix C.

A bat habitat assessment and a nocturnal bat survey were conducted on August 25, and a diurnal bat survey was conducted on September 2, 2011, all within the bat biological survey area. No bat activity or sign indicating that this bridge is used as a roosting site was detected during the surveys. However, three big brown bats (*Eptesicus fuscus*) were detected flying over the bridge and foraging in the surrounding areas during the nocturnal bat survey conducted on September 2, 2011.

A habitat assessment for Belding’s savannah’s sparrow and a habitat assessment for southwestern willow flycatcher were conducted on August 11, 2011, within the general BSA. Both habitat assessments determined that the BSA does not support potentially suitable habitat for either of these species. Consequently, focused surveys were not deemed necessary.

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Chapter 4. Results: Biological Resources — Discussion of Impacts and Mitigation

This chapter details the resources determined to be present based on survey results, the level of potential impacts that could result from each of the four Project alternatives, recommended mitigation measures, and the potential for cumulative effects. For cumulative impacts, the projects considered include 6 approved and 14 pending projects within the City of San Diego. These include mostly residential, commercial, and retail projects.

4.1. Natural Communities of Special Concern

A small portion of the proposed mitigation site for the constructed Fairbanks Ranch Project occurs within the BSA. However, because this project's mitigation effort was never implemented, impacts to these areas are not assessed as impacts to a mitigation site but are called out separately in this report. The mitigation site consists of two areas situated underneath the bridge. One of the sites occurs on the south bank of the river, 0.1 ac, and the other occurs on the north bank of the river, 0.4 ac.

Eleven depleted native vegetation communities are present within the BSA: disturbed southern willow scrub, mule-fat scrub, disturbed mule-fat scrub, coastal freshwater marsh, disturbed coastal freshwater marsh, disturbed brackish marsh, disturbed southern coastal salt marsh, disturbed wetland, alkali marsh, disturbed Diegan coastal sage scrub –coastal form and disturbed Diegan coastal sage scrub – Baccharis dominated. The following sections discuss the occurrence of these vegetation communities within the BSA and provide an analysis of anticipated impacts to these vegetation communities, proposed avoidance and minimization measures, proposed mitigation measures in accordance with the City's Biology Guidelines (City of San Diego 2002), and potential cumulative effects.

Mitigation for impacts to wetlands resulting from this project would be provided at the higher mitigation ratio required for areas within the Coastal Overlay Zone whether or not these areas occur within or outside of the Coastal Overlay Zone. Additional mitigation is proposed at ratios exceeding City of San Diego guidelines due to the sensitive nature of the Project. For example, the Western Alignment will result in combined permanent and temporary impacts of 0.82 ac to disturbed southern willow scrub, disturbed mule-fat scrub, tamarisk scrub and disturbed wetlands. Mitigation at City of San Diego ratios would require creation or enhancement of a maximum of 2.0 ac (3:1 for disturbed southern willow scrub and disturbed mule-fat scrub and 2:1 for tamarisk scrub and disturbed wetlands). Proposed mitigation includes creation of 3.0 ac of mule-fat scrub/southern willow scrub and enhancement of 2.0 ac of mule-fat scrub/southern willow scrub habitat, exceeding required mitigation.(see Table 4-1) Furthermore, all impacts are considered permanent and are mitigated at the highest required City ratios due to temporal loss of habitat function during the construction period.

Mitigation for impacts to sensitive uplands habitats would be provided through purchase of credits from the City's Cornerstone Landsat a ratio appropriate for areas situated inside of the MHPA that are considered "preserved" within the MHPA.

Tables 4-1 through 4-4 summarize the impacts and mitigation requirements associated with each of the four alternatives, including the impacts and mitigation requirements associated with the JPA mitigation site. Mitigation requirements for impacts in the JPA mitigation site would need to be provided in addition to the mitigation requirements for road and bridge improvements associated with each of the alternatives. It should be noted that impacts associated with the Roundabout Alternative exceed the area available for mitigation at the JPA site. Additional mitigation for the Roundabout Alternative will be accomplished through enhancement and creation of wetland habitats on approximately 10.8 ac of City owned land located immediately south of the JPA mitigation site and south of El Camino Real.

JPA Mitigation Site. Mitigation for impacts to wetlands resulting from the Project would be accomplished in their entirety on the JPA mitigation site for the Western, Central and Eastern alignments. Should the Roundabout Alignment be selected for construction, additional off-site mitigation will be required. This additional mitigation is presented in more detail below.

Currently, the JPA mitigation site supports native and nonnative vegetation communities of low ecological value. The 21.88 ac JPA mitigation site was formerly farmed for tomatoes but has been fallow for several years. Recent surveys (July 2013) have demonstrated that the dominant vegetation community on-site may be best described as disturbed Diegan coastal sage scrub – Baccharis dominated using the terminology of Oberbauer et al. (2008). This upland community is strongly dominated by coyote bush (*Baccharis pilularis*) with a high percentage of non-native weedy plant species, including five-hook bassia (*Bassia hyssopifolia*) and tree tobacco (*Nicotiana glauca*). Disturbed Diegan coastal sage scrub – Baccharis dominated comprises 14.3 ac of the 21.88 ac mitigation site. Other upland communities or habitats occurring on the mitigation area include disturbed Diegan coastal sage scrub – coastal form (0.03 ac), disturbed land (3.48 ac) and non-native grassland (0.04 ac).

Wetland habitats currently occurring within the JPA mitigation site are isolated, disturbed, and have low functions and values, compared to areas of higher quality habitat associated with the San Dieguito River. These include alkali marsh dominated by alkali weed (*Cressa* *truxillensis*; 0.48 ac), coastal freshwater marsh (0.05 ac,) disturbed coastal brackish marsh (0.08 ac), disturbed southern willow scrub (1.49 ac), disturbed wetland (0.23 ac) and tamarisk scrub (1.69 ac). Impacts to these wetland habitats are necessary in order to convert the parcel into wetland habitats that are of high value and high function, and are connected to the existing wetlands/riparian corridor associated with the San Dieguito River.

As presented previously in Chapter 1, not all of the wetlands occurring on the JPA mitigation site will be impacted. Disturbed and undisturbed coastal freshwater marsh will not be impacted, but are part of proposed enhancement. Only a small portion (0.07 ac) of disturbed southern willow scrub and 1.33 ac of the total 1.69 ac of tamarisk scrub will be converted to higher quality wetland habitat. All of the isolated alkali marsh (0.48 ac) will be converted to higher quality wetland habitat.

As presented previously in Chapter 1, a conceptual restoration plan has been developed to compensate for impacts to sensitive wetland habitats. The restoration plan for the JPA mitigation site is illustrated in Figure 7, is presented in detail in Appendix K and is summarized below. The additional mitigation required for the Roundabout Alternative is illustrated in Figure 8, is presented in detail in Appendix K and is summarized following the JPA mitigation site description.

The restoration plan for the JPA mitigation site includes approximately 20.4 ac of wetland habitat enhancement and creation, including enhancement of a 2.0 ac parcel of existing mule-fat scrub/southern willow scrub habitat located in the San Dieguito River; creation of 3.0 ac of mule-fat scrub/southern willow scrub habitat south of the enhancement area; and creation of approximately 15.4 ac of freshwater marsh habitat, 12.5 ac of which would be protected by an earthen berm and weir.

The protective earthen berm and weir will extend parallel to the San Dieguito River and will prevent sedimentation and scour within the created wetland during high flow events. The berm would extend east–west from the existing bridge abutment and would be open on the western end to provide a hydrological connection with the river. It would have a 10-ft-wide top, a height of 7 to 10 ft above the current ground level, and would be constructed at a 3:1 slope on both the channel side of the berm and the slope facing the mitigation area. An armored weir would be constructed within the berm and would be approximately 7 ft lower than the top of the berm. The weir would be approximately 250 ft long and would allow flows from the river to flow through the mitigation area during large flood events while excluding bedload sediment. The berm would be vegetated with coastal sage scrub species (Appendix K). The north-facing slope of the berm would be armored with turf reinforcement matting which can be cut to allow plants to establish in the soil beneath the matting. The inside slope of the berm will also be planted but will not require matting as water velocities within the created freshwater marsh habitat would not be erosive.

The berm will impact a total of 1.48 ac comprised of 1.13 of ac of disturbed Diegan coastal sage scrub – Baccharis dominated, 0.03 ac of disturbed coastal sage scrub – coastal form, 0.22 ac of disturbed land and 0.11 ac of tamarisk scrub . This leaves approximately 20.4 ac available for conversion to wetland habitats as mitigation. Mitigation for impacts associated with the berm will be accomplished through the purchase of credits for 1.16 ac from the City's Cornerstone Lands (1.16 ac of disturbed Diegan coastal sage scrub mitigated at 1:1) and the conversion of higher quality habitat (0.11 ac tamarisk scrub mitigated at 2:1).

In addition to the 0.11 ac of tamarisk scrub impacted by the berm, 2.0 ac of CDFW jurisdictional wetlands will be impacted from implementation of the wetland creation on the JPA site. This includes 1.22 ac of tamarisk scrub, 0.48 ac of alkali marsh, 0.23 ac disturbed wetland and 0.07 ac of disturbed southern willow scrub. Impacts to these low quality habitats are not considered permanent and will be mitigated within the JPA mitigation site (see Tables 4-1 – 4-4). The state and federal resource agencies with permitting authority have agreed that 1:1 mitigation for these habitats is acceptable, thus overriding City guidelines as allowed by the 2002 Land Development Code, Biology Guidelines.

Enhancement of 2.0 ac of existing disturbed southern willow scrub habitat by removal of non-native tamarisk (*Tamarix* sp.) will not result in impacts to this habitat. Creation of 3.0 ac of mule-fat scrub/southern willow scrub habitat immediately adjacent to and south of the river would convert primarily tamarisk scrub, disturbed land and disturbed Diegan coastal sage scrub – Baccharis dominated to mule-fat scrub/southern willow scrub. The largest component of the mitigation area would entail conversion of primarily Diegan coastal sage scrub – Baccharis dominated and disturbed land to freshwater marsh. Mitigation for impacts to wetlands in the JPA mitigation area would be provided at a 1:1 ratio because these impacts would occur as part of an effort to create higher quality wetland habitats. Mitigation for impacts to disturbed Diegan coastal sage scrub will be provided at a 1:1 ratio through purchase of credits from the City's Cornerstone Lands.

The former agricultural fields located to the west of the utility corridor are a part of the SANDAG W19 restoration project. This area will be converted to coastal salt marsh under conceptual plans being developed for that project.

Mule-fat Scrub/Southern Willow Scrub Enhancement Area. The approximately 2.0 ac site identified for enhancement is currently composed of mule-fat and willows and a high density of salt cedar, or tamarisk (*Tamarix* sp.), an exotic invasive species. Salt cedar and other invasive plant species would be cut and removed from the river, and the stumps treated with water-safe herbicide. The effectiveness of this treatment will be assessed during regular monitoring conducted for a 5-year monitoring period. Any treated individuals that resprout will be retreated and any new individuals that have become established will be similarly treated.

EL CAMINO REAL MITIGATION CONCEPT PLAN

Revised Date: 12/05/12

FIGURE 7

Image source: SanGIS (flown May 2012)

Potential Mitigation Areas

- Cismontane Alkali Marsh Creation
- Freshwater Marsh Enhancement
- Cismontane Alkali Marsh Restoration
- Southern Willow Scrub Enhancement

El Camino Real Road/Bridge Widening

Additional Mitigation Areas for Roundabout Alternative

0 Feet 750

Figure **8**

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Mule-fat Scrub/Southern Willow Scrub Creation Area. The 3.0 ac site identified for creation of Mule-fat Scrub/Southern Willow Scrub habitat would be constructed by removing approximately four feet of existing soil and planted with willows and mule-fat and understory species (Appendix K). Removal of four feet of soil would bring the area closer to the water table and expose soils that were not subject to fertilizers and amendments associated with former agricultural practices. With the existing ground surface varying between 11 and 12 ft National Geodetic Vertical Datum (NGVD), removal of four feet of soil would result in elevations of approximately 7 to 8 ft NGVD. The water table in this area was reported to be within 6 ft of the ground surface in 2006 (Tierra Environmental Services 2006). Two geotechnical borings implemented in support of the project in July 2011 encountered ground water at approximately 7 and 9 ft. Thus, by lowering the ground level by four feet, the southern willow scrub/mule-fat creation area would be sufficiently wet to support the proposed habitat.

Regular monitoring and maintenance will be conducted during the 5-year monitoring period. Monitoring will demonstrate attainment of project success criteria. Proposed monitoring methods, proposed monitoring schedule, and success criteria for each mitigation element are presented in detail in Appendix K

Freshwater Marsh Creation Area. Approximately 15.4 ac of former agricultural land, including 12.5 ac located behind the protective earthen berm, will be graded to approximately the same elevation as the existing freshwater marsh located in the riverbed to create coastal freshwater marsh habitat suitable for light-footed clapper rails (Figure 7). This area would be graded at a slight slope toward the river to allow slow water flow mimicking that within the river during low flow conditions. The freshwater marsh habitat would be planted with species that occur naturally in the river in the Project area, including California bulrush (*Schoenoplectus californicus*). Some species, such as southern cattail (*Typha domingensis*) are expected to establish from seed from nearby stock. A complete planting palette is presented in Appendix K.

All seeds and cuttings for propagation of container stock or for hydroseed application should be collected on-site, if possible, to retain the genetic integrity of the area. If certain species are not available, seeds and container stock may be obtained from a commercial source upon approval by the City, CALTRANS and the Wildlife Agencies.

Regular monitoring and maintenance will be conducted during the 5-year monitoring period. Monitoring will demonstrate attainment of project success criteria. Proposed monitoring methods, proposed monitoring schedule, and success criteria for each mitigation element are presented in detail in Appendix K.

Additional Mitigation Required for the Roundabout Alternative. As presented previously, mitigation for wetland impacts associated with the Roundabout Alternative exceed the acreage available on the JPA mitigation site by 6.48 ac. If the Roundabout Alternative is selected, the additional mitigation required would be achieved on an available site immediately south of the JPA site and south of El Camino Real. The site available for additional mitigation is an approximately 10.8-acre area of the western portion of Lot A of Gonzalez Canyon immediately south of the JPA site and El Camino Real. This site is part of a 33-acre City-owned parcel (APN 304-020-26) and is designated as open space within the City's MHPA. It is adjacent to a site approved for future wetland creation and enhancement areas for the St. John Garabed Church Project. The City also identified an approximately 3-acre area on City-owned parcel southeast of San Dieguito Road and Fairbanks Ranch Country Club (APN 302-262-05) suitable for enhancement.

These parcels are illustrated in Figure 8. This 10.8 ac portion of the 33-ac City-owned land (APN 304-020-26) includes the opportunity for cismontane alkali marsh creation (approximately 3.1 acres) and freshwater marsh enhancement (approximately 2.9 acres), which are both adjacent to the proposed wetland creation and enhancement areas for the St. John Garabed Church Project (Dudek 2013). The potential cismontane alkali marsh creation area is currently dominated by disturbed habitat including non-native invasive plants such as Bermuda grass (*Cynodon dactylon*) and mustards (*Brassica* spp.) as observed during a site visit on December 8, 2014 and during surveys conducted for the St. John Garabed Church Project (Dudek 2013). The potential freshwater marsh enhancement area contains freshwater marsh habitat dominated by cattail (*Typha* sp.) and bulrush (*Schoenoplectus* sp.) with non-natives including tamarisk, castor bean (*Ricinus communis*), and pampas grass (*Cortaderia jubata*). If additional mitigation is required, there are opportunities for cismontane alkali marsh restoration (2.9 ac) and southern willow scrub enhancement (1.9 ac) at this site. If site constraints on the additional mitigation site reduce the area available for restoration from what is described above, there is potential for southern willow scrub enhancement (3.2 ac) within a City-owned parcel located east of San Dieguito Road and south of Camino Santa Fe (see Figure 5).

Should the Roundabout Alternative be selected and additional mitigation areas be required, similar site preparation techniques, a planting and seed palette, and any maintenance and monitoring program described above for the JPA mitigation site will be implemented to ensure that the success criteria for the desired habitat types. Proposed acreages per mitigation type and habitat type have been included on Figure 8; however final acreage of each activity within these habitat types will be approved following the selection of an alternative and prior to permitting of the project.

Table 4-1. Project Impacts for the Western Alignment Alternative

Vegetation Community	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impacts (acres)	Mitigation Ratio	Mitigation Requirement (acres)	Proposed Mitigation (acres)
Wetland impacts associated with road and bridge improvement						
Disturbed southern willow scrub (DSWS)	0.21	0.09	0.3	3:1	0.9	**MFS/SWS – Enhancement: 2.0 ac MFS/SWS – Creation: 3.0 ac**. (Exceeds City requirements by 3.0 ac -1 ac creation and 2 ac enhancement)
Disturbed mule-fat scrub (DMFS)	0.03	0.03	0.06	3:1	0.18	
Tamarisk scrub (TS)	0.11	0.08	0.19	2:1	0.38	
Disturbed wetland (DW)	0.01	0.26	0.27	2:1	0.54	
Subtotal DSWS, DMFS, TS, DW	**0.36**	**0.46**	**0.82**		**2.00**	
Coastal freshwater marsh (CFM)	0.3	0.1677	0.48	4:1	1.92	
Coastal freshwater marsh[1](CFM[1])	0.0	0.0023	0.0023	4:1	0.0092	
Disturbed coastal freshwater marsh (DCFM)	0.33	0.01	0.34	4:1	1.36	
Subtotal CFM, CFM[1], DCFM	**0.63**	**0.18**	**0.8223**	**4:1**	**3.2892**	**3.2892 ac CFM creation**
Disturbed southern coastal salt marsh	**1.93**	**0.50**	**2.43**	**4:1**	**9.72**	**9.72 ac CFM creation**
Subtotal wetland impacts associated with road and bridge improvement	**2.92**	**1.14**	**4.0723**		**15.0092**	**13.0092 ac total CFM creation**
Wetland impacts associated with JPA mitigation site						
Disturbed southern willow scrub	0.07	0.00	0.07	1:1--	0.07*	Total wetland mitigation requirements of 17.2292 ac. 20.4 ac .available for mitigation. (Total mitigation exceeds City requirements for road and bridge improvement by 3.1708 ac).
Alkali marsh	0.48	0.00	0.48	1:1	0.48*	
Disturbed wetland	0.23	0.00	0.23	1:1	0.23*	
Tamarisk scrub	1.22	0.00	1.22	1:1	1.22*	
Tamarisk scrub (berm)	0.11	0.00	0.11	2:1	0.22	
Subtotal wetland impacts associated with JPA mitigation site	**2.11**	**0.0**	**2.11**		**2.22**	
Total wetland impacts and mitigation	**5.03**	**1.14**	**6.1823**		**17.2292**	
Upland impacts associated with road and bridge improvement						
Disturbed Diegan coastal sage scrub –coastal form	0.37	0.08	0.45	1:1	0.45	Cornerstone Lands
Disturbed Diegan coastal sage scrub -Bacharris dominated	0.34	0.12	0.46	1:1	0.46	Cornerstone Lands
Disturbed Land	3.12	0.79	3.91	0:1	0.0	None required
Disturbed Land[2]	0.0	0.0005	0.0005	0:1	0.0	None required
Disturbed Land[1]	0.004	0.016	0.020	0:1	0.0	None required

Table 4-1, continued

Vegetation Community	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impacts (acres)	Mitigation Ratio	Mitigation Requirement (acres)	Proposed Mitigation (acres)
Bare ground	0.06	0.02	0.08	0:1	0.0	None required
Ornamental	0.67	0.03	0.7	0:1	0.0	None required
Subtotal upland impacts associated with road and bridge improvement	**4.564**	**1.0565**	**5.6205**		0.91	Mitigation for impacts to 0.91 acre of disturbed Diegan coastal sage scrub accomplished through
Upland impacts associated with JPA mitigation site						
Disturbed Diegan coastal sage scrub –coastal form (berm)	0.03	0.0	0.03	1:1	0.03	Cornerstone Lands
Disturbed Diegan coastal sage scrub – Baccharis dominated (berm)	1.13	0.0	1.13	1:1	1.13	Cornerstone Lands
Disturbed Diegan coastal sage scrub – Baccharis dominated	13.17	0.0	13.17	1:1	13.17	Cornerstone Lands
Disturbed Land	3.41	0.0	3.41	0:0	0.0	None required
Non-native grassland	0.04	0.0	0.04		0.04	Cornerstone Lands
Subtotal upland impacts associated with JPA mitigation site	**17.81**	**0.00**	**17.81**		**14.37**	Mitigation for impacts to 14.33 acres of disturbed Diegan coastal sage scrub and 0.04 acre of non-native grassland accomplished through purchase of credits from Cornerstone Lands

[1]Within Fairbanks Mitigation Site, Northern
[2]Within Fairbanks Mitigation Site, Southern
* Impacts to wetland habitats within the JPA Mitigation Site will be mitigated by creation of higher quality wetland habitats in the restored JPA Mitigation Site at a 1:1 ratio.

Table 4-2. Project Impacts for the Central Alignment Alternative

Vegetation Community	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impacts (acres)	Mitigation Ratio	Mitigation Requirement (acres)	Proposed Mitigation (acres)
Wetland impacts associated with road and bridge improvement						
Disturbed southern willow scrub (DSWS)	0.04	0.02	0.06	3:1	0.18	**MFS/SWS – Enhancement: 2.0 ac**
Mule-fat scrub (MFS)	0.0164	0.0215	0.0379	3:1	0.114	
Mule-fat scrub[1] (MFS)	0.0036	0.0085	0.012	3:1	0.035	
Disturbed mule-fat scrub (DMFS)	0.08	0.02	0.10	3:1	0.30	
Disturbed wetland (DW)	0.60	0.0	0.60	2:1	1.2	
Subtotal DSWS, DMFS, TS, DW	**0.74**	**0.069**	**0.8099**		**1.82**	**MFS/SWS – Creation: 3.0 ac** (Exceeds City requirements by 3.18 ac – 1.18 ac creation and 2.0 ac enhancement)
Coastal freshwater marsh (CFM)	0.386	0.30	0.686	4:1	2.744	
Coastal freshwater marsh[2] (CFM[2])	0.004	0.0	0.004	4:1	0.016	
Disturbed coastal freshwater marsh (DCFM)	0.35	0.0	0.35	4:1	1.40	
Subtotal CFM, CFM[2], DCFM	**0.74**	**0.30**	**1.04**	**4:1**	**4.16**	
Disturbed southern coastal salt marsh	**2.19**	**0.56**	**2.75**	**4:1**	**11.00**	**4.16 ac CFM creation**
Subtotal wetland impacts associated with road and bridge improvement	**3.67**	**0.929**	**4.5999**		**16.98**	**11.00 ac CFM creation 15.16 ac total CFM creation**
Wetland impacts associated with JPA mitigation site						
Disturbed southern willow scrub	0.07	0.00	0.07	1:1--	0.07*	Total wetland mitigation requirement 19.2 ac. 20.4 ac available for mitigation. (Total mitigation exceeds City requirements for road and bridge improvement by 1.2 acre)
Alkali marsh	0.48	0.00	0.48	1:1	0.48*	
Disturbed wetland	0.23	0.00	0.23	1:1	0.23*	
Tamarisk scrub	1.22	0.00	1.22	1:1	1.22*	
Tamarisk scrub (berm)	0.11	0.00	0.11	2:1	0.22	
Subtotal wetland impacts associated with JPA mitigation site	**2.11**	**0.0**	**2.11**		**2.22**	
Total wetland impacts and mitigation	**5.78**	**0.929**	**6.71**		**19.2**	
Upland impacts associated with road and bridge improvement						
Disturbed Diegan coastal sage scrub – coastal form	0.515	0.0	0.515	1:1	0.515	Cornerstone Lands
Disturbed Diegan coastal sage scrub – coastal form1	0.035	0.0026	0.038	1:1	0.038	Cornerstone Lands
Disturbed Diegan coastal sage scrub - Bacharris dominated	0.09	0.12	0.21	1:1	0.46	Cornerstone Lands
Disturbed Land	3.52	0.623	4.143	0:1	0.0	None required

Table 4-2, continued

Vegetation Community	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impacts (acres)	Mitigation Ratio	Mitigation Requirement (acres)	Proposed Mitigation (acres)
Disturbed Land[1]	0.0031	0.0	0.0031	0:1	0.0	None required
Disturbed Land[2]	0.052	0.017	0.069	0:1	0.0	None required
Eucalyptus woodland	0.164	0.015	0.179	0:1	0.0	None required
Eucalyptus woodland[1]	0.056	0.025	0.081	0:1	0.0	None required
Ornamental	0.54	0.32	0.86	0:1	0.0	None required
Bare ground	0.23	0.0	0.23	0:1	0.0	None required
Urban/Developed	6.28	1.09	7.37	0:1	0.0	None required
Developed[1]	0.0	0.017	0.017	0:1	0.0	None required
Developed[2]	0.0001	0.0	0.0001	0:1	0.0	None required
Subtotal upland impacts associated with road and bridge improvement	**4.564**	**1.0565**	**5.6205**		**0.763**	Mitigation for impacts to 0.763 acre of disturbed Diegan coastal sage scrub accomplished through purchase of credits from Cornerstone Lands
Upland impacts associated with JPA mitigation site						
Disturbed Diegan coastal sage scrub – coastal form (berm)	0.03	0.0	0.03	1:1	0.03	Cornerstone Lands
Disturbed Diegan coastal sage scrub – Baccharis dominated (berm)	1.13	0.0	1.13	1:1	1.13	Cornerstone Lands
Disturbed Diegan coastal sage scrub – Baccharis dominated	13.17	0.0	13.17	1:1	13.17	Cornerstone Lands
Disturbed Land	3.41	0.0	3.41	0:0	0.0	None required
Non-native grassland	0.04	0.0	0.04	1:1	0.04	Cornerstone Lands
Subtotal upland impacts associated with JPA mitigation site	**17.81**	**0.00**	**17.81**		**14.37**	Mitigation for impacts to 14.33 acres of disturbed Diegan coastal sage scrub and 0.04 acre of non-native grassland accomplished through purchase of credits from Cornerstone Lands

[1]Fairbanks Mitigation Site, northern [2]Fairbanks Mitigation Site, southern
* Impacts to wetland habitats within the JPA Mitigation Site will be mitigated by creation of higher quality wetland habitats in the restored JPA Mitigation Site at a 1:1 ratio.

Table 4-3. Project Impacts for the Eastern Alignment Alternative

Vegetation Community	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impacts (acres)	Mitigation Ratio	Mitigation Requirement (acres)	Proposed Mitigation (acres)
Wetland impacts associated with road and bridge improvement						
Disturbed southern willow scrub (DSWS)	0.04	0.08	0.12	3:1	0.36	**MFS/SWS – Enhancement: 2.0 ac**
Mule-fat scrub (MFS)	0.172	0.05	0.222	3:1	0.666	
Mule-fat scrub[1] (MFS)	0.068	0.0	0.068	3:1	0.204	
Disturbed mule-fat scrub (DMFS)	0.13	0.12	0.25	3:1	0.75	
Tamarisk scrub	0.003	0.0	0.003	2:1	0.006	
Disturbed wetland (DW)	0.01	0.06	0.07	2:1	0.14	
Subtotal DSWS, MFS, MFS[1], DMFS, DW	**0.423**	**0.313**	**0.733**		**2.126**	**MFS/SWS – Creation: 3.0 ac** (Exceeds City requirements by 2.88 ac – 0.88 ac creation and 2.0 ac enhancement)
Coastal freshwater marsh (CFM)	0.4481	0.74	1.1881	4:1	4.7524	
Coastal freshwater marsh[2](CFM[3])	0.0019	0.0021	0.004	4:1	0.016	
Disturbed coastal freshwater marsh (DCFM)	0.33	0.05	0.384	4:1	1.52	
Subtotal CFM, CFM[2], DCFM	**0.78**	**0.7921**	**1.5761**	**4:1**	**6.2884**	
Disturbed southern coastal salt marsh	**1.64**	**0.63**	**2.27**	**4:1**	**9.08**	**6.2884 ac CFM creation**
Subtotal wetland impacts associated with road and bridge improvement	**2.843**	**1.7351**	**4.5791**		**17.4944**	**9.08 ac CFM creation 15.3684 ac total CFM creation**
Wetland impacts associated with JPA mitigation site						
Disturbed southern willow scrub	0.07	0.00	0.07	1:1--	0.07*	Total mitigation requirement 19.7144 ac. 20.4 ac available for mitigation (Total mitigation exceeds City requirements for road and bridge improvement by 0.6858 ac)
Alkali marsh	0.48	0.00	0.48	1:1	0.48*	
Disturbed wetland	0.23	0.00	0.23	1:1	0.23*	
Tamarisk scrub	1.22	0.00	1.22	1:1	1.22*	
Tamarisk scrub (berm)	0.11	0.00	0.11	2:1	0.22	
Subtotal wetland impacts associated with JPA mitigation site	**2.11**	**0.0**	**2.11**	**1:1**	**2.22**	
Total wetland impacts and mitigation	**4.95**	**1.7351**	**6.6891**		**19.7144**	
Upland impacts associated with road and bridge improvement						
Disturbed Diegan coastal sage scrub –coastal form	0.313	0.09	0.403	1:1	0.403	Cornerstone Lands
Disturbed Diegan coastal sage scrub –coastal form[2]	0.037	0.0	0.037	1:1	0.037	Cornerstone Lands
Disturbed Diegan coastal sage scrub - Bacharris dominated	0.0	0.0002	0.0002	1:1	0.0002	Cornerstone Lands
Disturbed Land	2.00	0.84	2.84	0:1	0.0	None required

Table 4-3, continued

Vegetation Community	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impacts (acres)	Mitigation Ratio	Mitigation Requirement (acres)	Proposed Mitigation (acres)
Disturbed Land[1]	0.0031	0.0	0.0031	0:1	0.0	None required
Disturbed Land[2]	0.089	0.0076	0.097	0:1	0.0	None required
Eucalyptus woodland	0.22	0.05	0.27	0:1	0.0	None required
Eucalyptus woodland[2]	0.15	0.0002	0.01502	0:1	0.0	None required
Ornamental	0.15	0.34	0.49	0:1	0.0	None required
Bare ground	0.33	0.04	0.37	0:1	0.0	None required
Urban/Developed	6.87	1.46	8.33	0:1	0.0	None required
Urban/Developed[1]	0.11	0.0	0.11	0:1	0.0	None required
Urban/Developed[2]	0.0001	0.0	0.0001	0:1	0.0	None required
Subtotal upland impacts associated with road and bridge improvement	**13.11**	**4.56**	**17.67**		**0.4402**	Mitigation for impacts to 0.4402 acre of disturbed Diegan coastal sage scrub accomplished through purchase of credits from Cornerstone Lands.
Upland impacts associated with JPA mitigation site						
Disturbed Diegan coastal sage scrub –coastal form (berm)	0.03	0.0	0.03	1:1	0.03	Cornerstone Lands
Disturbed Diegan coastal sage scrub – Baccharis dominated (berm)	1.13	0.0	1.13	1:1	1.13	Cornerstone Lands
Disturbed Diegan coastal sage scrub – Baccharis dominated	13.17	0.0	13.17	1:1	13.17	Cornerstone Lands
Disturbed Land	3.41	0.0	3.41	0:0	0.0	None required
Non-native grassland	0.04	0.0	0.04		0.04	Cornerstone Lands
Subtotal upland impacts associated with JPA mitigation site	**17.81**	**0.00**	**17.81**		**14.37**	Mitigation for impacts to 14.33 acres of disturbed Diegan coastal sage scrub and 0.04 acre of non-native grassland accomplished through purchase of credits from Cornerstone Lands

[1]Fairbanks Mitigation Site, northern [2]Fairbanks Mitigation Site, southern

* Impacts to wetland habitats within the JPA Mitigation Site will be mitigated by creation of higher quality wetland habitats in the restored JPA Mitigation Site at a 1:1 ratio.

Table 4-4. Project Impacts for the Roundabout Alignment Alternative

Vegetation Community	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impacts (acres)	Mitigation Ratio	Mitigation Requirement (acres)	Proposed Mitigation (acres)[1]
Wetland impacts associated with road and bridge improvement						
Disturbed southern willow scrub (DSWS)	0.25	0.06	0.31	3:1	0.93	**MFS/SWS – Enhancement: 2.0 ac** **MFS/SWS – Creation: 3.0 ac**. (Exceeds City requirements by 2.236 ac - 0.236 ac creation and 2 ac enhancement)
Mule-fat scrub (MFS)	0.2	0.02	0.22	3:1	0.66	
Mule-fat scrub[2] (MFS[2])	0.068	0.0	0.068	3:1	0.204	
Disturbed mule-fat-scrub (DMFS)	0.17	0.08	0.25	3:1	0.75	
Disturbed wetland (DW)	0.04	0.07	0.11	2:1	0.22	
Tamarisk scrub	0.003	0.0	0.003	2:1	0.006	
Subtotal DSWS, MFS, MFS[2], DMFS, TS, DW	**0.731**	**0.23**	**0.961**		**2.77**	
Coastal freshwater marsh (CFM)	0.45	0.82	1.27	4:1	5.08	
Coastal freshwater marsh[3](CFM[3])	0.0019	0.0022	0.0041	4:1	0.0164	
Disturbed coastal freshwater marsh (DCFM)	0.34	0.04	0.38	4:1	1.52	
Alkali marsh (AM)	0.0002	0.03	0.0302	4:1	0.1208	
Subtotal CFM, CFM[3], DCFM, AM	**0.7921**	**0.8922**	**1.6843**	**4:1**	**6.7372**	**6.7372 ac CFM creation**
Disturbed southern coastal salt marsh	**3.11**	**0.68**	**3.79**	**4:1**	**15.16**	**15.16 ac CFM creation** **21.8972 total CFM creation**
Subtotal wetland impacts associated with road and bridge improvement	**4.6331**	**1.8052**	**6.4353**		**24.6672**	
Wetland impacts associated with JPA mitigation site						
Disturbed southern willow scrub	0.07	0.00	0.07	1:1--	0.07*	**26.8872 ac of mitigation exceeds the size of the JPA mitigation area by 6.482 ac. Additional mitigation achieved through a combination of wetland creation and enhancement of 10.8 ac of City-owned land in the San Dieguito River Valley.**
Alkali marsh	0.48	0.00	0.48	1:1	0.48*	
Disturbed wetland	0.23	0.00	0.23	1:1	0.23*	
Tamarisk scrub	1.22	0.00	1.22	1:1	1.22*	
Tamarisk scrub (berm)	0.11	0.0	0.11	2:1	0.22	
Subtotal wetland impacts associated with JPA mitigation site	**2.11**	**0.0**	**2.11**		**2.22**	
Total wetland impacts and mitigation	**6.7431**	**2.9452**	**8.5453**		**26.8872**	
Upland impacts associated with road and bridge improvement						
Disturbed Diegan coastal sage scrub –coastal form	0.43	0.26	0.69	1:1	0.69	Cornerstone Lands
Disturbed Diegan coastal sage scrub –coastal form[2]	0.037	0.0	0.037	1:1	0.037	

Table 4-4, continued

Vegetation Community	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impacts (acres)	Mitigation Ratio	Mitigation Requirement (acres)	Proposed Mitigation (acres)[1]
Disturbed Diegan coastal sage scrub - Bacharris dominated	0.01	0.05	0.06	1:1	0.06	Cornerstone Lands
Disturbed Land	3.04	0.94	3.98	0:1	0.0	None required
Disturbed Land[2]	0.0031	0.0	0.0031	0:1	0.0	None required
Disturbed Land[3]	0.088	0.0882	0.096	0:1	0.0	None required
Eucalyptus woodland	0.24	0.03	0.27	0:1	0.0	None required
Eucalyptus woodland[2]	0.15	0.002	0.1502	0:1	0.0	None required
Bare ground	0.09	0.09	0.18	0:1	0.0	None required
Ornamental	0.35	0.21	0.56	0:1	0.0	None required
Urban/Developed	10.21	1.97	12.18	0:1	0.0	None required
Urban/Developed[2]	0.11	0.0	0.11	0:1	0.0	None required
Urban/Developed[30.11]	0.0	0.0001	0.001	0:1	0.0	None required
Subtotal upland impacts associated with road and bridge improvement	**14.7481**	**3.5903**	**17.6973**		**0.787**	Mitigation for impacts to 0.787 acre of disturbed Diegan coastal sage scrub accomplished through purchase of credits from Cornerstone Lands
Upland impacts associated with JPA mitigation site						
Disturbed Diegan coastal sage scrub –coastal form (berm)	0.03	0.0	0.03	1:1	0.03	Cornerstone Lands.
Disturbed Diegan coastal sage scrub – Baccharis dominated (berm)	1.13	0.0	1.13	1:1	1.13	Cornerstone Lands
Disturbed Diegan coastal sage scrub – Baccharis dominated	13.17	0.0	13.17	1:1	13.17	Cornerstone Lands
Disturbed Land	3.41	0.0	3.41	0:0	0.0	None required
Non-native grassland	0.04	0.0	0.04		0.04	Cornerstone Lands
Subtotal upland impacts associated with JPA mitigation site	**17.81**	**0.00**	**17.81**		**14.37**	Mitigation for impacts to 14.33 acres of disturbed Diegan coastal sage scrub and 0.04 acre of non-native grassland accomplished through purchase of credits from Cornerstone Lands

Table 4-4, continued

[1]Additional mitigation opportunities for marsh habitat are being negotiated by the City and SANDAG. As currently proposed, the mitigation acreage is insufficient to meet project requirements.
[2]Fairbanks Ranch Site, northern
[3]Fairbanks Ranch Site, southern
* Impacts to wetland habitats within the JPA Mitigation Site will be mitigated by creation of higher quality wetland habitats in the restored JPA Mitigation Site at a 1:1 ratio.

4.1.1. Southern Willow Scrub (63320)

Vegetation communities associated with riparian systems, such as southern willow scrub, were once extensive along the major rivers of coastal southern California, but have been greatly reduced by urbanization, flood control, and streambed improvements. Southern willow scrub is known to provide suitable nesting habitat for a variety of birds, including federally and state endangered least Bell's vireo and yellow warbler (*Dendroica petechia*) a California Species of Special Concern (SSC). Furthermore, disturbed southern willow scrub occurring adjacent to the San Dieguito River can be utilized by light-footed clapper rail for foraging and when seeking refuge from high flows.

Much of the riparian scrub within the study area is also jurisdictional under the CWA, Sections 401 and 404, and CDFW Code 1602. See Section 4.2 for analysis of impacts under these regulations.

4.1.1.1. SURVEY RESULTS

In the BSA, disturbed southern willow scrub occurs in association with the San Dieguito River and upslope of a small drainage east of El Camino Real. Disturbed southern willow scrub along the San Dieguito River is contiguous with other wetland habitats and provides suitable nesting habitat for several avian species, including least Bell's vireo. Disturbed southern willow scrub supports invasive species but is contiguous with other wetland habitats ranging from low to high ecological value and is considered to be of moderate ecological value. Disturbed southern willow scrub east of El Camino Real consists of a small patch situated adjacent to a major road. This patch is considered to be of low ecological value due to its small size, its proximity to a road, and its distance from other habitats of higher ecological value.

4.1.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

The Project involves the widening/replacement of a bridge that currently crosses over the San Dieguito River. Consequently, there are limitations to the measures that can be implemented to reduce and minimize impacts to wetlands. Four alternatives with varying levels of impacts to wetlands are being analyzed in this NES. During Project development, the width of the bridge was reduced to the minimum required to accomplish the purpose and need of the Project. Thus, the current width of the four alternatives has been reduced compared to widths reported in the draft EIR circulated in 2006.

Projects within the City of San Diego are required to avoid wetlands to the maximum extent possible (City of San Diego 2002). Where wetlands cannot be avoided, impacts must be minimized and mitigation provided to offset these impacts.

The Project footprint would be demarcated prior to construction in order to avoid encroachment into surrounding sensitive areas. Furthermore, a qualified biologist would monitor construction activities for the duration of the Project to ensure that practicable measures are being employed to avoid incidental disturbance of habitat outside of the Project footprint.

4.1.1.3. Project Impacts

Western Alignment Alternative

The Western Alignment Alternative would result in permanent impacts to 0.21 ac and temporary impacts to 0.09 ac of disturbed southern willow scrub (Figure 6a).

Central Alignment Alternative

The Central Alignment Alternative would result in permanent impacts to 0.04 ac and temporary impacts to 0.02 ac of disturbed southern willow scrub (Figure 6b).

Eastern Alignment Alternative

The Eastern Alignment Alternative would result in permanent impacts to 0.04 ac and temporary impacts to 0.08 ac of disturbed southern willow scrub (Figure 6c).

Roundabout Alignment Alternative

The Roundabout Alignment Alternative would result in permanent impacts to 0.25 ac and temporary impacts to 0.06 ac of disturbed southern willow scrub (Figure 6d).

JPA Mitigation Area

Implementation of a wetland creation/enhancement plan on the JPA mitigation area would result in minimal impacts to southern willow scrub where the proposed southern willow scrub/mule-fat scrub creation would daylight with similar habitats in the San Dieguito River. The JPA mitigation area supports 1.50 ac of disturbed southern willow scrub. Of this, 1.43 ac would be enhanced as southern willow scrub/mule-fat scrub and, thus, would not be considered impacted (Figure 6e). Approximately 0.07 acre of disturbed southern willow scrub occurs within the boundaries of the proposed southern willow scrub/mule-fat scrub creation site (Figure 6e) and may be impacted during construction. All effort will be taken to avoid this impact during construction.

4.1.1.4. Compensatory Mitigation

Mitigation for unavoidable impacts to sensitive wetland habitats would be accomplished by: (1) creating habitat of equal value in the vicinity of the Project and (2) enhancing degraded wetland habitats in the Project vicinity through the removal of exotic plant species. The City also requires that unavoidable wetland impacts within the Coastal Overlay Zone be mitigated in the Coastal Overlay Zone (City of San Diego 2002).

Mitigation requirements for riparian scrub habitat situated within the Coastal Overlay Zone are typically higher than those for riparian habitat situated outside of the Coastal Overlay Zone. Mitigation for all impacts to disturbed southern willow scrub resulting from road and bridge improvement would be provided at the higher 3:1 mitigation ratio through creation/enhancement of mule-fat scrub/southern willow scrub habitat whether the impact occurs within or outside of the Coastal Overlay Zone. Mitigation for impacts to southern willow scrub resulting from mitigation at the JPA site will be mitigated at a 1:1 ratio.

Under the conceptual restoration plan, mitigation for impacts to disturbed southern willow scrub have been combined with mitigation for impacts to mule-fat scrub, disturbed mule-fat scrub, tamarisk scrub and disturbed wetland. The impacts to these habitats will be mitigated through enhancement of a 2.0 ac of existing mule-fat scrub/southern willow scrub and creation of 3.0 ac mule-fat scrub/southern willow scrub within the JPA mitigation site (Figure 7). The areas proposed for enhancement and creation (5.0 ac) exceeds the area required by the higher mitigation ratios within the Coastal Overlay Zone by approximately a factor of 2.5,for example, 5.0 total ac proposed as mitigation in exceedance of the 2.00 ac of combined mitigation required for these habitats for the Western Alignment Alternative (see Tables 4.1 – 4.4). Thus, Project impacts to these habitats are considered fully mitigated.

4.1.1.5. CUMULATIVE IMPACTS

Implementation of the proposed Project and recent and foreseeable projects in the vicinity of the Project site would not result in adverse cumulative impacts to southern willow scrub. Federal, state, and local policies require that projects have no net loss of riparian vegetation communities, including southern willow scrub. The proposed Project would mitigate its impacts to southern willow scrub at a ratio of 3:1 for impacts associated with road and bridge improvement. All mitigation will be in the form of creation. As presented above, mitigation is proposed in the form of creation and enhancement at ratios greater than those required. Other projects that could contribute to cumulative impacts to southern willow scrub in the Project area will also be required to comply with policies for wetland creation and mitigation at these acreage ratios. Therefore, no net loss to wetlands and no cumulative impact to this habitat type would result from the proposed Project.

4.1.2. Mule-Fat Scrub (63310)

Vegetation communities associated with riparian systems, such as mule-fat scrub, are considered depleted natural vegetation communities because they have declined throughout southern California during past decades. Mule-fat scrub is known to support a variety of avian species. Mule-fat scrub occurring adjacent to the San Dieguito River can be utilized by light-footed clapper rail for foraging and when seeking refuge from high flows.

Much of the riparian scrub within the study area is also jurisdictional under the CWA, Sections 401 and 404, and CDFW Code 1602. See Section 4.2 for analysis of impacts under these regulations.

4.1.2.1. Survey Results

In the BSA, mule-fat scrub occurs in association with the San Dieguito River. Both undisturbed and disturbed mule-fat scrub occurring along the river provide habitat for several bird species and are contiguous with other riparian scrub habitats, including southern willow scrub. Thus, mule-fat scrub and disturbed mule-fat scrub along the river are considered to be of moderate ecological value.

4.1.2.2. Avoidance and Minimization Efforts

Avoidance and minimization efforts related to mule-fat scrub are identical to those discussed in Section 4.1.1.2 above related to southern willow scrub.

4.1.2.3. Project Impacts

Western Alignment Alternative

The Western Alignment Alternative would result in permanent impacts to 0.03 ac and temporary impacts to 0.03 ac of disturbed mule-fat scrub (Figure 6a).

Central Alignment Alternative

The Central Alignment Alternative would result in permanent impacts to 0.0164 ac and temporary impacts to 0.0215 ac of mule-fat scrub, and in permanent impacts to 0.08 ac and temporary impacts to 0.02 ac of disturbed mule-fat scrub. In addition, 0.0036 ac of permanent impacts and 0.0085 ac of temporary impacts to mule-fat scrub would occur within the proposed mitigation area for the constructed Fairbanks Ranch Project (Figure 6b).

Eastern Alignment Alternative

The Eastern Alignment Alternative would result in permanent impacts to 0.172 ac and temporary impacts to 0.05 ac of mule-fat scrub, and in permanent impacts to 0.13 ac and temporary impacts to 0.12 ac of disturbed mule-fat scrub. In addition, 0.068 ac of permanent impacts to mule-fat scrub would occur within the proposed mitigation area for the constructed Fairbanks Ranch Project (Figure 6c).

Roundabout Alignment Alternative

The Roundabout Alignment Alternative would result in permanent impacts to 0.2 ac and temporary impacts to 0.02 ac of mule-fat scrub, and in permanent impacts to 0.17 ac and temporary impacts to 0.08 ac of disturbed mule-fat scrub. In addition, 0.068 ac of permanent impact to mule-fat scrub would occur within the proposed mitigation area for the constructed Fairbanks Ranch Project (Figure 6d).

JPA Mitigation Area

Implementation of a wetland creation/enhancement plan on the JPA mitigation area would not result in impacts to disturbed mule-fat scrub (Figure 6e).

4.1.2.4. COMPENSATORY MITIGATION

Mitigation for unavoidable impacts to sensitive wetland habitats would be accomplished by: (1) creating habitat of equal value in the vicinity of the Project and (2) enhancing degraded wetland habitats in the Project vicinity through the removal of exotic plant species. The City also requires that unavoidable wetland impacts within the Coastal Overlay Zone be mitigated in the Coastal Overlay Zone (City of San Diego 2002).

Mitigation requirements for riparian scrub habitat situated within the Coastal Overlay Zone are typically higher than those for riparian habitat situated outside of the Coastal Overlay Zone. Mitigation for all impacts to mule-fat scrub and disturbed mule-fat scrub resulting from this Project alignment would be provided at ratios higher than 3:1through creation/enhancement of mule-fat scrub/southern willow scrub whether the impact occurs within or outside of the Coastal Overlay Zone.

Under the conceptual restoration plan, mitigation for impacts to mule-fat scrub and disturbed mule-fat scrub, have been combined with mitigation for impacts to disturbed southern willow scrub, tamarisk scrub and disturbed wetland. The impacts to these habitats will be mitigated through enhancement of 2.0 ac of existing mule-fat scrub/southern willow scrub and creation of 3.0 ac of mule-fat scrub within the JPA mitigation site (Figure 7). The areas proposed for enhancement and creation (5.0 ac) exceeds the area required by the higher mitigation ratios within the Coastal Overlay Zone by approximately a factor of 2.5. For example, 5.0 total ac proposed as mitigation for impacts to 2.00 ac of combined habitats for the Western Alignment Alternative (see Tables 4.1 – 4.4). Thus, Project impacts to these habitats are considered fully mitigated.

4.1.2.5. CUMULATIVE IMPACTS

Implementation of the proposed Project and recent and foreseeable projects in the vicinity of the Project site would not result in adverse cumulative impacts to mule-fat scrub. Federal, state, and local policies require that projects have no net loss of riparian vegetation communities, including mule-fat scrub. Furthermore, the proposed Project would mitigate impacts to mule-fat scrub at a ratio of at least 3:1.The Project proposes to offset all impacts to mule-fat scrub through creation of 3.0 ac of mule-fat scrub/southern willow scrub habitat. Additional mitigation beyond the creation of 3.0 ac will be accomplished through enhancement of 2.0 acres of disturbed southern willow scrub. Thus, mitigation is proposed in the form of enhancement and creation at ratios exceeding the mitigation requirements. Other projects that could contribute to cumulative impacts to mule-fat scrub in the Project area will also be required to comply with policies for wetland creation and mitigation at these acreage ratios. Therefore, no net loss of wetlands and no cumulative impact to this habitat type would result from the proposed Project.

4.1.3. Coastal Freshwater Marsh (52410)

Coastal freshwater marsh is considered a sensitive community based on its limited acreage, the impacted status of this community type in southern California, and its value as wildlife habitat. This vegetation community is known to support a variety of wildlife species, including the light-footed clapper rail.

Much of the wetland habitats within the study area are also jurisdictional under the CWA, Sections 401 and 404, and CDFW Code 1602. See Section 4.2 for analysis of impacts under these regulations.

4.1.3.1. Survey Results

Coastal freshwater marsh occurring along the San Dieguito River is considered to be of high ecological value. This habitat is contiguous with more expansive areas of wetland habitats and is known to support special-status species including the light-footed clapper rail, Clark's marsh wren, and southwestern spiny rush. Disturbed coastal freshwater marsh occurring in the San Dieguito River is of low ecological value due to the abundance of nonnative grasses and the absence of vegetation providing suitable cover for wildlife species. Disturbed coastal freshwater marsh in the drainages parallel to Via de la Valle and parallel to El Camino Real (north of the polo field) are also of low ecological value due to their narrow width, lack of connectivity with wetlands of higher ecological value, and proximity to disturbed land and developed areas.

4.1.3.2. Avoidance and Minimization Efforts

Avoidance and minimization efforts related to coastal freshwater marsh are identical to those discussed in Section 4.1.1.2 above related to southern willow scrub.

4.1.3.3. Project Impacts

A total of 0.24 ac of coastal freshwater marsh currently exists under, and shaded by, the existing bridge. Under the western alignment and central alignment alternatives, this area of freshwater marsh will remain shaded after the bridge is widened. Under the eastern and roundabout alignment alternatives, this area would be temporarily impacted during demolition of the existing bridge.

Western Alignment Alternative

The Western Alignment Alternative would result in permanent impacts to 0.3 ac and temporary impacts to 0.1677 ac of coastal freshwater marsh, and in permanent impacts to 0.33 ac and temporary impacts to 0.01 ac of disturbed coastal freshwater marsh. In addition, 0.0023 ac of temporary impacts to coastal freshwater marsh would occur within the proposed mitigation area for the constructed Fairbanks Ranch Project (Figure 6a).

Central Alignment Alternative

The Central Alignment Alternative would result in permanent impacts to 0.386 ac and temporary impacts to 0.30 ac of coastal freshwater marsh, and in permanent impacts to 0.35 ac of disturbed coastal freshwater marsh. In addition, 0.004 ac of permanent impacts to coastal freshwater marsh would occur within the proposed mitigation area for the constructed Fairbanks Ranch Project (Figure 6b).

Eastern Alignment Alternative

The Eastern Alignment Alternative would result in permanent impacts to 0.4481 ac and temporary impacts to 0.74 ac of coastal freshwater marsh, and in permanent impacts to 0.33 ac and temporary impacts to 0.05 ac of disturbed coastal freshwater marsh. In addition, 0.0019 ac of permanent impacts and 0.0021 ac of temporary impacts to coastal freshwater marsh would occur within the proposed mitigation area for the constructed Fairbanks Ranch Project (Figure 6c).

Roundabout Alignment Alternative

The Roundabout Alignment Alternative would result in permanent impacts to 0.45 ac and temporary impacts to 0.82 ac of coastal freshwater marsh, and in permanent impacts to 0.34 ac and temporary impacts to 0.04 ac of disturbed coastal freshwater marsh. In addition, 0.0019 ac of permanent impacts and 0.0022 ac of temporary impacts to coastal freshwater marsh would occur within the proposed mitigation area for the constructed Fairbanks Ranch Project (Figure 6d).

JPA Mitigation Area

Implementation of a wetland creation/enhancement plan on the JPA mitigation area would result in enhancement of 0.05 ac of disturbed coastal freshwater marsh, which is not considered to be an impact to this sensitive natural community (Figure 6e).

4.1.3.4. COMPENSATORY MITIGATION

Mitigation for unavoidable impacts to sensitive wetland habitats would be accomplished by: (1) creating habitat of equal value in the vicinity of the Project and (2) enhancing degraded wetland habitats in the Project vicinity through the removal of exotic plant species. The City also requires that unavoidable wetland impacts within the Coastal Overlay Zone be mitigated in the Coastal Overlay Zone (City of San Diego 2002).

Impacts to coastal wetlands, such as undisturbed and disturbed coastal freshwater marsh require mitigation at a 4:1 ratio (City of San Diego 2002) regardless of their location relative to the Coastal Overlay Zone. Mitigation for permanent and temporary impacts to coastal freshwater marsh and disturbed coastal freshwater marsh would be provided at a 4:1 ratio through creation of freshwater marsh within the proposed JPA mitigation area. Under the conceptual restoration plan, impacts to coastal freshwater marsh and disturbed coastal freshwater marsh would be mitigated through creation of high quality freshwater marsh habitat at a 4:1 ratio. Mitigation for impacts associated with the Western Alignment Alternative would be mitigated through creation of approximately 3.28924 ac of coastal freshwater marsh to compensate for impacts to disturbed and undisturbed freshwater marsh and 9.72 ac to compensate for impacts to disturbed coastal salt marsh for a total creation of approximately 13.0092 ac (Table 4-1). The Central Alignment Alternative would require approximately 4.16 ac of freshwater marsh as mitigation for impacts to disturbed and undisturbed coastal freshwater marsh and 11.0 ac to compensate for impacts to disturbed coastal salt marsh for a total creation of approximately 15.16 ac (Table 4-2). The Eastern Alignment and Roundabout Alignment alternatives would require approximately 15.3864 and 21.8972 ac, respectively (Tables 4-3 and 4-4). Given the area of the JPA mitigation site (approximately 20.4 ac), creation of freshwater marsh as mitigation for impacts to both existing disturbed and undisturbed coastal freshwater marsh and existing disturbed coastal salt marsh can be accomplished for the Western Alignment, Central Alignment, and Eastern Alignment Alternatives while accommodating mitigation for impacts to other wetland habitats. Thus, Project impacts to this habitat are considered fully mitigated on the JPA mitigation site for these three alignments.

Additional mitigation would be required for the Roundabout Alternative. Mitigation for impacts to 6.4353 ac of wetland impacts from road and bridge improvement at City ratios requires creation of 24.6672 ac of wetland habitat. This exceeds the capacity of the proposed JPA mitigation area. An additional 2.11 ac of wetland habitat will be impacted at the JPA site for a total wetland mitigation burden of 26.8872 ac. The Roundabout Alternative would require an additional 6.48 acres of wetland mitigation beyond the JPA mitigation site. The City of San Diego owns a parcel in Gonzales Canyon immediately south of the JPA site and south of El Camino Real that is considered suitable for mitigation, through a combination of creation and enhancement on up to 10.8 acres. A Memorandum of Understanding is in process should it become necessary to proceed with this additional mitigation. Details on this additional wetland creation and enhancement have been presented previously and are not repeated here. Impacts to sensitive upland habitats, including 0.787 ac of disturbed Diegan coastal sage scrub associated with road and bridge improvement and 14.33 ac disturbed Diegan coastal sage scrub habitats associated with the JPA mitigation site, will be mitigated through purchase of credits from the City's Cornerstone Lands.

4.1.3.5. Cumulative Impacts

Implementation of the proposed Project and recent and foreseeable projects in the vicinity of the Project site would not result in adverse cumulative impacts to coastal freshwater marsh and disturbed coastal freshwater marsh. Federal, state, and local policies require that projects have no net loss of wetland vegetation communities, including coastal freshwater marsh and disturbed coastal freshwater marsh. The proposed Project would mitigate impacts to coastal freshwater marsh and disturbed coastal freshwater marsh at a ratio of 4:1. For every acre of wetland impact, at least 1 acre of the affected habitat must be created elsewhere, and the remaining balance must be enhanced at an existing location until a total of 4 mitigation acres are provided. As presented above, mitigation is proposed as creation at a 4:1 ratio. Other projects that could contribute to cumulative impacts to coastal freshwater marsh and disturbed coastal freshwater marsh would also be required to comply with these policies for wetland creation and mitigation at these acreage ratios. Therefore, no net loss to wetlands and no cumulative impacts to this habitat type would result from the proposed Project.

4.1.4. Coastal Brackish Marsh (52200)

Coastal brackish marsh is considered a sensitive community based on its limited and decreasing acreage in southern California and its value as wildlife habitat.

Much of the wetland habitats within the study area are also jurisdictional under the CWA, Sections 401 and 404, and CDFW Code 1602. See Section 4.2 for analysis of impacts under these regulations.

4.1.4.1. Survey Results

Disturbed coastal brackish marsh occurring along the southern bank of the San Dieguito River is considered to be of moderate ecological value. Although this habitat is small in size and supports nonnative species, it is contiguous with more expansive areas of other wetland habitats. This small area of disturbed brackish marsh provides an opening in riparian scrub habitat that can be utilized as foraging habitat by bird species. This area is considered to be a remnant of what was once a more expansive vegetation community.

4.1.4.2. Avoidance and Minimization Efforts

Avoidance and minimization efforts related to disturbed coastal brackish marsh are identical to those discussed in Section 4.1.1.2 above related to southern willow scrub.

4.1.4.3. Project Impacts

Project Alternatives

None of the four Project alternatives would result in impacts to disturbed coastal brackish marsh.

JPA Mitigation Area

Implementation of a wetland creation/enhancement plan on the JPA mitigation area would result in enhancement of 0.08 ac of disturbed coastal brackish marsh, which is not considered to be an impact to this sensitive natural community.

4.1.4.4. Compensatory Mitigation

Because the four Project alternatives and implementation of the proposed wetland creation/enhancement plan on the JPA mitigation area would not result in impacts to this sensitive natural community, compensatory mitigation is not required.

4.1.4.5. Cumulative Impacts

Because the Project would not result in impacts to coastal brackish marsh, it would not contribute to a potentially cumulative impact to this sensitive natural community.

4.1.5. Disturbed Southern Coastal Salt Marsh (52120)

Southern coastal salt marsh is considered a sensitive community based on its limited acreage, the impacted status of this community type in southern California, and its value as wildlife habitat.

Much of the wetland habitats within the study area are also jurisdictional under the CWA, Sections 401 and 404, and CDFW Code 1602. See Section 4.2 for analysis of impacts under these regulations.

4.1.5.1. Survey Results

Disturbed southern coastal salt marsh occurs east of El Camino Real, north of the polo field, and in the JPA mitigation area. The majority of the area north of the polo field is on private property and is used as a parking lot a few days out of the year. The portion utilized for parking is bordered by snow fencing to the north and west, which impounds water for a period of 3 weeks or greater each rainy season. The distribution of salt marsh vegetation in this area varies depending on the level of disturbance. Typically, after heavy disturbance this area is predominated by salt grass. Disturbed southern coastal salt marsh in this area supports low plant species diversity, does not provide habitat for wildlife species typically associated with this habitat, and is subject to high levels of disturbance. Thus, it is of low ecological value.

Southern coastal salt marsh vegetation extending north and west of the snow fencing has higher plant species diversity. However, this area also does not provide suitable habitat for wildlife species typically associated with coastal salt marsh because it is very narrow, does not provide sufficient vegetative cover for wildlife movement, is situated adjacent to a high traffic road, and is not contiguous with other habitats of higher ecological value. Thus, this area of disturbed coastal salt marsh is also of low ecological value.

4.1.5.2. Avoidance and Minimization Efforts

Avoidance and minimization efforts related to southern coastal salt marsh are identical to those discussed in Section 4.1.1.2 above related to southern willow scrub.

4.1.5.3. Project Impacts

Western Alignment Alternative

The Western Alignment Alternative would result in permanent impacts to 1.93 ac and temporary impacts to 0.5 ac of disturbed southern coastal salt marsh (Figure 6a).

Central Alignment Alternative

The Central Alignment Alternative would result in permanent impacts to 2.19 ac and temporary impacts to 0.56 ac of disturbed southern coastal salt marsh (Figure 6b).

Eastern Alignment Alternative

The Eastern Alignment Alternative would result in permanent impacts to 1.64 ac and temporary impacts to 0.63 ac of disturbed southern coastal salt marsh (Figure 6c).

Roundabout Alignment Alternative

The Roundabout Alignment Alternative would result in permanent impacts to 3.11 ac and temporary impacts to 0.68 ac of disturbed southern coastal salt marsh (Figure 6d).

JPA Mitigation Area

Implementation of a wetland creation/enhancement plan on the JPA mitigation area would not result in impacts to disturbed southern coastal salt marsh (Figure 6e).

4.1.5.4. Compensatory Mitigation

Mitigation for unavoidable impacts to sensitive wetland habitats would be accomplished by: (1) creating habitat of equal value in the vicinity of the Project and (2) enhancing degraded wetland habitats in the Project vicinity through the removal of exotic plant species. The City also requires that unavoidable wetland impacts within the Coastal Overlay Zone be mitigated in the Coastal Overlay Zone (City of San Diego 2002).

Impacts to coastal wetlands, such as disturbed coastal salt marsh, require mitigation at a 4:1 ratio (City of San Diego 2002) regardless of their location relative to the Coastal Overlay

Zone. Under the conceptual restoration plan, impacts to disturbed coastal salt marsh and disturbed and undisturbed coastal freshwater marsh would be mitigated through creation of high quality freshwater marsh habitat at a 4:1 ratio. Mitigation for impacts to disturbed salt marsh associated with the Western Alignment Alternative would be mitigated through creation of approximately 9.72 ac of coastal freshwater marsh (Table 4-1). The Western Alignment Alternative would require 11.0 ac of freshwater marsh as mitigation for impacts to disturbed salt marsh (Table 4-2) and the Eastern Alignment and Roundabout Alignment alternatives would require approximately 9.08 and 15.16 ac, respectively (Tables 4-3 and 4-4). Given the area of the JPA mitigation site (approximately 20.4), creation of freshwater marsh as mitigation for impacts to both existing coastal freshwater marsh and existing disturbed coastal salt marsh can be accomplished for the Western Alignment, Central Alignment and Eastern Alignment alternatives while accommodating mitigation for impacts to other wetland habitats. Thus, Project impacts to this habitat are considered fully mitigated on the JPA mitigation site for these three alignments.

Additional mitigation would be required for the Roundabout Alternative. Mitigation for impacts to 6.4353 ac of wetland impacts from road and bridge improvement at City ratios requires creation of 24.6672 ac of wetland habitat. This exceeds the capacity of the proposed JPA mitigation area. An additional 2.11 ac of wetland habitat will be impacted at the JPA site for a total wetland mitigation burden of 26.8872 ac. The Roundabout Alternative would require an additional 6.48 acres of wetland mitigation beyond the JPA mitigation site. The City of San Diego owns a parcel in Gonzales Canyon immediately south of the JPA site and south of El Camino Real that is considered suitable for mitigation, through a combination of creation and enhancement on up to 10.8 acres. A Memorandum of Understanding is in process should it become necessary to proceed with this additional mitigation. Details on this additional wetland creation and enhancement have been presented previously and are not repeated here. Impacts to sensitive upland habitats, including 0.787 ac of disturbed Diegan coastal sage scrub associated with road and bridge improvement and 14.33 ac disturbed Diegan coastal sage scrub habitats associated with the JPA mitigation site, will be mitigated through purchase of credits from the City’s Cornerstone Lands.

4.1.5.5. CUMULATIVE IMPACTS

Implementation of the proposed Project and recent and foreseeable projects in the vicinity of the Project site would not result in adverse cumulative impacts to disturbed coastal salt marsh. Federal, state, and local policies require that projects have no net loss of wetland vegetation communities, including disturbed coastal salt marsh. The proposed Project would mitigate its impacts to coastal salt marsh at a ratio of 4:1. Of this, 1:1 will be in the form of creation. For every ac of wetland impact, at least 1 ac of the affected habitat must be created elsewhere, and the remaining balance must be enhanced at an existing location until a total of 4 mitigation ac are provided. As presented above, mitigation is proposed in the form of creation at a 4:1 ratio. Other projects that could contribute to cumulative impacts to disturbed coastal salt marsh in the area would also be required to comply with policies for wetland creation and mitigation at these acreage ratios. Therefore, no net loss to wetlands and no cumulative impact to this habitat type would result from the proposed Project.

4.1.6. Alkali Marsh (52300)

Alkali marsh is considered a sensitive community based on its limited acreage, the impacted status of this community type in southern California, and its value as wildlife habitat.

Much of the wetland habitats within the study area are also jurisdictional under the CWA, Sections 401 and 404, and CDFW Code 1602. See Section 4.2 for analysis of impacts under these regulations.

4.1.6.1. Survey Results

Alkali marsh occurring in the southern corner of the JPA mitigation area is considered to be of low ecological value due to its small size, isolation from other wetland habitats and dominance by a single species, alkali weed (*Cressa truxillensis*).

4.1.6.2. Avoidance and Minimization Efforts

Avoidance and minimization efforts related to alkali marsh are identical to those discussed in Section 4.1.1.2 above related to southern willow scrub.

4.1.6.3. Project Impacts

Project Alternatives

Roundabout Alternative

The Roundabout Alternative would result in temporary impacts to 0.0002 ac and temporary impacts to 0.03 ac of alkali marsh. None of the other three Project alternatives would result in impacts to alkali brackish marsh.

JPA Mitigation Area

Implementation of the freshwater marsh component on the JPA mitigation area would result in impacts to 0.48 ac of alkali marsh. This small, isolated, remnant wetland community would be converted to more productive freshwater marsh habitat and provide habitat for numerous wildlife species, including the light-footed clapper rail.

4.1.6.4. Compensatory Mitigation

Mitigation for unavoidable impacts to sensitive wetland habitats would be accomplished by: (1) creating habitat of equal value in the vicinity of the Project and (2) enhancing degraded wetland habitats in the Project vicinity through the removal of exotic plant species. The City also requires that unavoidable wetland impacts within the Coastal Overlay Zone be mitigated in the Coastal Overlay Zone (City of San Diego 2002).

Impacts to coastal wetlands, such as alkali marsh, require mitigation at a 4:1 ratio (City of San Diego 2002) regardless of their location relative to the Coastal Overlay Zone. Under the conceptual restoration plan, impacts to disturbed coastal salt marsh, disturbed and undisturbed coastal freshwater marsh and alkali marsh would be mitigated through creation of high quality freshwater marsh habitat at a 4:1 ratio. Mitigation for impacts to disturbed salt marsh associated with the Western Alignment Alternative would be mitigated through creation of approximately 9.72 ac of coastal freshwater marsh (Table 4-1). The Central Alignment Alternative would require 11.0 ac of freshwater marsh as mitigation for impacts to disturbed salt marsh (Table 4-2) and the Eastern Alignment and Roundabout Alignment alternatives would require approximately 9.08 and 15.16 ac, respectively (Tables 4-3 and 4-4). Given the area of the JPA mitigation site (approximately 20.4 ac), creation of freshwater marsh as mitigation for impacts to both existing coastal freshwater marsh and existing disturbed coastal salt marsh can be accomplished for the Western Alignment, Central Alignment and Eastern Alignment alternatives while accommodating mitigation for impacts to other wetland habitats. Thus, Project impacts to this habitat are considered fully mitigated on the JPA mitigation site for these three alignments.

Additional mitigation would be required for the Roundabout Alternative. Mitigation for impacts to 6.4353 ac of wetland impacts from road and bridge improvement at City ratios requires creation of 24.6672 ac of wetland habitat. This exceeds the capacity of the proposed JPA mitigation area. An additional 2.11 ac of wetland habitat will be impacted at the JPA site for a total wetland mitigation burden of 26.8872 ac. The Roundabout Alternative would require an additional 6.48 acres of wetland mitigation beyond the JPA mitigation site. The City of San Diego owns a parcel in Gonzales Canyon immediately south of the JPA site and south of El Camino Real that is considered suitable for mitigation, through a combination of creation and enhancement on up to 10.8 acres. A Memorandum of Understanding is in process should it become necessary to proceed with this additional mitigation. Details on this additional wetland creation and enhancement have been presented previously and are not repeated here. Impacts to sensitive upland habitats, including 0.787 ac of disturbed Diegan coastal sage scrub associated with road and bridge improvement and 14.33 ac disturbed Diegan coastal sage scrub habitats associated with the JPA mitigation site, will be mitigated through purchase of credits from the City's Cornerstone Lands.

4.1.6.5. CUMULATIVE IMPACTS

Implementation of the proposed Project and recent and foreseeable projects in the vicinity of the Project site would not result in adverse cumulative impacts to alkali marsh. Federal, state, and local policies require that projects have no net loss of wetland vegetation communities, including disturbed alkali marsh. The proposed Project would mitigate its impacts to marsh at a ratio of 4:1 through creation of freshwater marsh. As presented above, mitigation is proposed in the form of creation at a 4:1 ratio.

Mitigation for impacts to 0.48 ac of alkali marsh resulting from the implementation of the proposed wetland creation/enhancement at the JPA mitigation area will be provided at a 1:1 ratio. A lower mitigation ratio is being provided for these impacts because they would occur in association with a mitigation plan that would improve the function and values of wetlands in this area. Currently, the alkali marsh habitat on the mitigation site is of low ecological value. No net loss of wetlands would occur as a result of the mitigation plan.

4.1.7. Disturbed Wetland (11200)

Disturbed wetland is considered a sensitive vegetation community based on the presence of wetland vegetation. Areas mapped as disturbed wetland also are typically jurisdictional under the CWA, Sections 401 and 404, and/or CDFW Code 1602. See Section 4.2 for analysis of impacts under these regulations.

4.1.7.1. SURVEY RESULTS

In the BSA, disturbed wetland occurs in the JPA mitigation area in an area on which crops were not previously cultivated. The distinct change in plant composition clearly demarcates the boundary between disturbed wetland and surrounding disturbed areas. This area of disturbed wetland has low plant diversity and is not contiguous with other wetland habitats and is therefore considered to be of low ecological value.

Disturbed wetland located immediately west of the polo field consists of a narrow strip of wetland vegetation that is mowed regularly by the property owner. This area previously supported disturbed coastal brackish marsh (Tierra 2006). However, due to the high level of disturbance in this area, this area is now classified as a disturbed wetland and is of low ecological value.

4.1.7.2. AVOIDANCE AND MINIMIZATION EFFORTS

Avoidance and minimization efforts related to disturbed wetland are identical to those discussed in Section 4.1.1.2 above related to southern willow scrub.

4.1.7.3. PROJECT IMPACTS

Western Alignment Alternative

The Western Alignment Alternative would result in permanent impacts to 0.01 ac and temporary impacts to 0.26 ac of disturbed wetland (Figure 6a).

Central Alignment Alternative

The Central Alignment Alternative would result in permanent impacts to 0.6 ac of disturbed wetland (Figure 6b).

Eastern Alignment Alternative

The Eastern Alignment Alternative would result in permanent impacts to 0.01 ac and temporary impacts to 0.06 ac of disturbed wetland (Figure 6c).

Roundabout Alignment Alternative

The Roundabout Alignment Alternative would result in permanent impacts to 0.04 ac and temporary impacts to 0.07 ac of disturbed wetland (Figure 6d).

JPA Mitigation Area

Implementation of a wetland creation/enhancement plan on the JPA mitigation area would result in impacts to 0.23 ac of disturbed wetland (Figure 6e).

4.1.7.4. COMPENSATORY MITIGATION

Mitigation for unavoidable impacts to sensitive wetland habitats would be accomplished by: (1) creating habitat of equal value in the vicinity of the Project and (2) enhancing degraded wetland habitats in the Project vicinity through the removal of exotic plant species. The City also requires that unavoidable wetland impacts within the Coastal Overlay Zone be mitigated in the Coastal Overlay Zone (City of San Diego 2002).

Impacts to wetlands, such as disturbed wetland, require mitigation at a 2:1 ratio (City of San Diego 2002) regardless of their location relative to the Coastal Overlay Zone. Mitigation for permanent and temporary impacts to disturbed wetland would be provided at a 2:1 ratio through creation/enhancement of southern willow scrub/mule-fat scrub within the proposed JPA mitigation area (Tables 4-1 – 4-4).

Mitigation for impacts to disturbed wetland resulting from implementation of the proposed wetland creation/enhancement at the JPA mitigation area will be provided at a 1:1 ratio. A lower mitigation ratio is being provided for these impacts because they would occur in association with a mitigation plan that would improve the function and values of wetlands in this area.

4.1.7.5. Cumulative Impacts

Implementation of the proposed Project and recent and foreseeable projects in the vicinity of the Project site would not result in adverse cumulative impacts to disturbed wetland. Federal, state, and local policies require that projects have no net loss of wetland communities, including disturbed wetland. The proposed Project would mitigate impacts to disturbed wetland at a ratio of 2:1. Of this, 1:1 will be in the form of creation. For every ac of wetland impact, at least 1 ac of the affected habitat must be created elsewhere, and the remaining balance must be enhanced at an existing location until a total of 2 mitigation ac are provided. Other projects that could contribute to cumulative impacts to disturbed wetland would also be required to comply with policies for wetland creation and mitigation at these acreage ratios. Therefore, no net loss to wetlands and no cumulative impact to this habitat type would result from the proposed Project.

4.1.8. Tamarisk Scrub (63810)

Tamarisk scrub is a vegetation community associated with riparian systems. Although this vegetation community is comprised of tamarisk, an invasive, nonnative tree species, it is known to provide suitable foraging habitat for a variety of common and special-status birds, including the least Bell's vireo. Furthermore, tamarisk scrub occurring adjacent to the San Dieguito River can be utilized by light-footed clapper rail for foraging and when seeking refuge from high flows.

Much of the riparian scrub within the study area is also jurisdictional under the CWA, Sections 401 and 404, and CDFW Code 1602. See Section 4.2 for analysis of impacts under these regulations.

4.1.8.1. Survey Results

In the BSA, tamarisk scrub occurs in association with the San Dieguito River and is contiguous with other wetland habitats, including disturbed southern willow scrub, which is known to support least Bell's vireo. Tamarisk scrub also provides suitable nesting habitat for several avian species. This vegetation community in the BSA is considered to be of moderate ecological value.

4.1.8.2. Avoidance and Minimization Efforts

Avoidance and minimization efforts related to tamarisk scrub are identical to those discussed in Section 4.1.1.2 above related to southern willow scrub.

4.1.8.3. PROJECT IMPACTS

Western Alignment Alternative

The Western Alignment Alternative would result in permanent impacts to 0.11 ac and temporary impacts to 0.08 ac of tamarisk scrub (Figure 6a).

Central Alignment Alternative

The Central Alignment Alternative would not result in impacts to tamarisk scrub (Figure 6b).

Eastern Alignment Alternative

The Eastern Alignment Alternative would result in permanent impacts to 0.003 ac and no temporary impacts to tamarisk scrub (Figure 6c).

Roundabout Alignment Alternative

The Roundabout Alignment Alternative would result in permanent impacts to 0.003 ac and no temporary impacts to tamarisk scrub (Figure 6d).

JPA Mitigation Area

Implementation of a wetland creation/enhancement plan on the JPA mitigation area would result in the conversion of 1.221 ac of tamarisk scrub to southern willow scrub/mule-fat scrub, and impact approximately 0.11 ac by construction of the earthen berm for a total of 1.33 ac 0f impact (Figure 6e).

4.1.8.4. COMPENSATORY MITIGATION

Mitigation for permanent and temporary impacts to tamarisk scrub resulting from the proposed road widening and bridge replacement would be provided at a 2:1 ratio through creation/enhancement of southern willow scrub/mule-fat scrub within the proposed JPA mitigation area, with creation occurring at a minimum ratio of 1:1. Conversion of 1.22 ac of tamarisk scrub to mule-fat scrub/southern willow scrub as a result of implementation of the proposed wetland creation/enhancement plan would not require additional compensatory mitigation because the functions and values of this area would be increased and no net loss of riparian vegetation would occur. Impacts to 1.22 ac of tamarisk scrub converted to higher quality wetlands on the JPA mitigation area will be mitigated at 1:1 through creation of higher quality habitats. The 0.11 ac of this habitat impacted by the berm will be mitigated at 2:1 through creation/enhancement of mule-fat scrub habitat/southern willow scrub habitat.

4.1.8.5. CUMULATIVE IMPACTS

Implementation of the proposed Project and recent and foreseeable projects in the vicinity of the Project site would not result in adverse cumulative impacts to riparian habitat, including tamarisk scrub. The proposed Project would mitigate its impacts to tamarisk scrub at a 1:1

ratio where tamarisk scrub is converted into higher quality riparian scrub habitats and at a ratio of 2:1 for impacts associated with the berm. Other projects that could contribute to cumulative impacts to tamarisk scrub (and other riparian habitats) would also be required to comply with policies for wetland creation and mitigation at these acreage ratios. Therefore, no net loss to wetlands and no cumulative impact to riparian habitat would result from the proposed Project.

4.1.9. Diegan Coastal Sage Scrub – Coastal Form (32510)

Diegan coastal sage scrub – coastal form is considered a Tier II uncommon upland by the City. Coastal sage scrub - costal from is a plant community of concern because its extent has been drastically reduced during recent decades primarily due to residential development in the coastal foothills of southern California. Vegetation of this type can provide potential habitat for a number of special-status species, including coastal California gnatcatcher (*Polioptila californica californica*).

4.1.9.1. SURVEY RESULTS

Disturbed Diegan coastal sage scrub – coastal form in the BSA occurs as sparsely vegetated, narrow strips of habitat. Due to their narrow width, sparse vegetative cover, and proximity to developed areas, areas of disturbed Diegan coastal sage scrub – coastal from are considered to be of low ecological value. Disturbed Diegan coastal sage scrub – coastal form in the BSA occurs inside and outside of the MHPA boundaries.

4.1.9.2. AVOIDANCE AND MINIMIZATION EFFORTS

The Project footprint would be demarcated prior to construction in order to avoid encroachment into surrounding sensitive areas. Furthermore, a qualified biologist would monitor construction activities for the duration of the Project to ensure that practicable measures are being employed to avoid incidental disturbance of habitat outside of the Project footprint.

4.1.9.3. PROJECT IMPACTS

Western Alignment Alternative

The Western Alignment Alternative would result in permanent impacts to 0.37 ac and temporary impacts to 0.08 ac of disturbed Diegan coastal sage scrub – coastal form (Figure 6a).

Central Alignment Alternative

The Central Alignment Alternative would result in permanent impacts to 0.515 ac of disturbed Diegan coastal sage scrub – coastal form. In addition, 0.035 ac of permanent impacts and 0.0026 ac of temporary impacts would occur within the proposed mitigation area for the constructed Fairbanks Ranch Project (Figure 6b).

Eastern Alignment Alternative

The Eastern Alignment Alternative would result in permanent impacts to 0.313 ac and temporary impacts to 0.09 ac of disturbed Diegan coastal sage scrub – coastal form. In addition, 0.037 ac of permanent impact occurs within the proposed mitigation area for the constructed Fairbanks Ranch Project (Figure 6c).

Roundabout Alignment Alternative

The Roundabout Alignment Alternative would result in permanent impacts to 0.43 ac and temporary impacts to 0.26 ac of disturbed Diegan coastal sage scrub. In addition, 0.037 ac of permanent impacts to disturbed Diegan coastal sage scrub occur within the proposed mitigation area for the constructed Fairbanks Ranch Project (Figure 6d).

JPA Mitigation Area

Implementation of a wetland creation/enhancement plan on the JPA mitigation area would result in impacts to 0.03 ac of disturbed Diegan coastal sage scrub – coastal form (Figure 6e).

4.1.9.4. COMPENSATORY MITIGATION

Mitigation for impacts to disturbed Diegan coastal sage scrub – coastal form would be accomplished through purchase of credits from the City's Cornerstone Lands. Per the City of San Diego Biology Guidelines (City of San Diego 2002), mitigation for impacts to coastal sage scrub and disturbed coastal sage scrub will be required at a 1:1 ratio for areas of sage scrub situated inside and outside of the MHPA and mitigated for within a "Preserve."

Santa Catalina Island buckwheat is a species endemic to Santa Catalina Island but has been planted in the mainland, including San Diego. This species was detected within the BSA in disturbed Diegan coastal sage scrub south of the river and west of El Camino Real. Santa Catalina Island buckwheat is known to hybridize with coastal California buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), which also occurs in the BSA. Efforts to remove Santa Catalina Island buckwheat from the mainland are ongoing. Santa Catalina Island buckwheat occurring within the impact area should be removed and disposed of appropriately. Care should be taken so that seeds are not dispersed during removal of this species.

4.1.9.5. CUMULATIVE IMPACTS

Implementation of the proposed Project and recent and foreseeable projects in the vicinity of the Project site would not result in adverse cumulative impacts to disturbed Diegan coastal sage scrub. Project conformance with the City of San Diego MSCP guidelines (City of San

Diego 1997) and conditions of coverage ensures that no cumulative impacts to biological resources would occur as a result of the proposed Project. The MSCP facilitates coordinated regional conservation of biological resources and mitigation for impacts within the City boundaries.

4.1.10. Diegan Coastal Sage Scrub – Baccharis Dominated (32530)

Diegan coastal sage scrub – Baccharis dominated is considered a Tier II uncommon upland by the City. Coastal sage scrub – Baccharis dominated is a plant community of concern because its extent has been reduced during recent decades primarily due to development of the coastal terraces of southern California. Vegetation of this type can provide potential habitat for a number of special-status species, including coastal California gnatcatcher (*Polioptila californica californica*).

4.1.10.1. Survey Results

JPA Mitigation Area

Disturbed Diegan coastal sage scrub – Baccharis dominated in the BSA occurs as large patches of habitat in the former agricultural fields of the JPA mitigation area and within the alignment of the Project alternatives. Due to the highly disturbed nature of this habitat, e.g., high percent cover by non-native plant species, areas of disturbed Diegan coastal sage scrub – Baccharis dominated are considered to be of low ecological value. Disturbed Diegan coastal sage scrub – Baccharis dominated in the BSA occurs inside and outside of the MHPA boundaries.

4.1.10.2. Avoidance and Minimization Efforts

The Project proposes conversion of low quality disturbed Diegan coastal sage scrub – Baccharis dominated to higher quality habitats, including coastal freshwater marsh and mule-fat scrub/southern willow scrub. Mitigation for impacts to disturbed Diegan coastal sage scrub – Baccharis dominated would be accomplished through purchase of credits from the City's Cornerstone Lands. Per the City of San Diego Biology Guidelines (City of San Diego 2002), mitigation for impacts to coastal sage scrub and disturbed coastal sage scrub will be required at a 1:1 ratio for areas of sage scrub situated inside and outside of the MHPA and mitigated for within a "Preserve."

4.1.10.3. Project Impacts

Western Alignment Alternative

The Western Alignment Alternative would result in permanent impacts to 0.34 ac and temporary impacts to 0.12 ac of disturbed Diegan coastal sage scrub – Baccharis dominated (Figure 6a).

Central Alignment Alternative

The Central Alignment Alternative would result in permanent impacts to 0.09 ac and temporary impacts to 0.12 ac of disturbed Diegan coastal sage scrub – Baccharis dominated. (Figure 6b).

Eastern Alignment Alternative

The Eastern Alignment Alternative would result in permanent impacts to 0.0 ac and temporary impacts to 0.0002 ac of disturbed Diegan coastal sage scrub – Baccharis dominated (Figure 6c).

Roundabout Alignment Alternative

The Roundabout Alignment Alternative would result in permanent impacts to 0.01 ac and temporary impacts to 0.05 ac of disturbed Diegan coastal sage scrub – Baccharis dominated. (Figure 6d).

JPA Mitigation Area

Implementation of a wetland creation/enhancement plan on the JPA mitigation area would result in impacts to 14.3 ac of disturbed Diegan coastal sage scrub – Baccharis dominated (Figure 6e).

4.1.10.4. Compensatory Mitigation

Mitigation for impacts to disturbed Diegan coastal sage scrub – Baccharis dominated would be accomplished through purchase of credits from the City's Cornerstone Lands. Per the City of San Diego Biology Guidelines (City of San Diego 2002), mitigation for impacts to coastal sage scrub and disturbed coastal sage scrub will be required at a 1:1 ratio for areas of sage scrub situated inside and outside of the MHPA and mitigated for within a "Preserve."

4.1.10.5. Cumulative Impacts

Implementation of the proposed Project and recent and foreseeable projects in the vicinity of the Project site would not result in adverse cumulative impacts to disturbed Diegan coastal sage scrub. Project conformance with the City of San Diego MSCP guidelines (City of San Diego 1997) and conditions of coverage ensures that no cumulative impacts to biological resources would occur as a result of the proposed Project. The MSCP facilitates coordinated regional conservation of biological resources and mitigation for impacts within the City boundaries.

4.1.11. Non-Native Grassland (42200)

Non-native grassland is a City of San Diego Tier III B common upland habitat. Although this vegetation community is dominated by non-native invasive grass species, its value to small mammals and the animals that prey upon them, especially raptors has been noted.

4.1.11.1. Survey Results

JPA Mitigation Area

Non-native grassland exists within the BSA in a small (0.04 ac), isolated patch in the northwestern portion of the JPA mitigation area. Non-native grassland does not occur along any of the 4 Project alignments. This habitat is considered to be of low ecological value due to its dominance by non-native species and low plant species diversity. Non-native grassland occurs within the boundaries of the MSCP and will be mitigated within those boundaries by creation of higher quality wetland habitats.

4.1.11.2. Avoidance and Minimization

The Project proposes conversion of low quality disturbed non-native grassland to higher quality habitats, including coastal freshwater marsh and mule-fat scrub/southern willow scrub .

4.1.11.3. Compensatory Mitigation

Mitigation for impacts to disturbed non-native grassland would be accomplished through purchase of credits from the City's Cornerstone Lands. Per the City of San Diego Biology Guidelines (City of San Diego 2002), mitigation for impacts to non-native grassland will be required at a 1:1 ratio for areas of non-native grassland situated inside and outside of the MHPA and mitigated for within a "Preserve."

4.1.11.4. Cumulative Impacts

Implementation of the proposed Project and recent and foreseeable projects in the vicinity of the Project site would not result in adverse cumulative impacts to non-native grassland. Project conformance with the City of San Diego MSCP guidelines (City of San Diego 1997) and conditions of coverage ensures that no cumulative impacts to biological resources would occur as a result of the proposed Project. The MSCP facilitates coordinated regional conservation of biological resources and mitigation for impacts within the City boundaries.

4.2. Jurisdictional Waters and Wetlands

The following results are taken from the Preliminary Jurisdictional Delineation for the El Camino Real Bridge Replacement Project prepared by ICF, which is provided as Appendix D to this report and from San Dieguito W19 Restoration Site Wetland Delineation Report prepared by CALTRANS District 11, which is provided as Appendix E.

4.2.1. Survey Results

A formal delineation of the BSA identified the presence of resources under the jurisdiction of USACE, RWQCB, CDFW, and the City, including wetland waters of the U.S., non-wetland waters of the U.S., state streambed, and adjacent wetlands/riparian habitat. All four Project alternatives would result in impacts to jurisdictional resources as discussed below in Section 4.2.3 and outlined in Table 4-5.

Wetland habitats occurring within and in association with the San Dieguito River channel are considered to be of high ecological value. These habitats are contiguous with other areas of high quality habitat, support several special-status species, including light-footed clapper rail and least Bell's vireo, and are part of an important wildlife corridor. These habitats provide high quality nesting and foraging habitat for several wildlife species.

Wetland habitats occurring outside of the river channel are of low ecological value. These habitats are not contiguous with larger areas of higher quality habitat. Wetland habitats occurring parallel to El Camino Real and Via de la Valle are narrow, small in size, adjacent to high traffic roads, and provide marginal foraging and nesting habitat for wildlife species. The area north of the polo field and south of Via de la Valle is highly disturbed because this area is used as a parking lot for events at the polo field. Areas within the JPA mitigation area are also of low quality because they are open, occur as patches, and are not contiguous to higher quality habitat.

4.2.2. Avoidance and Minimization Efforts

Avoidance and minimization efforts related to jurisdictional waters and wetlands are identical to those discussed in Section 4.1.1.2 above related to southern willow scrub.

4.2.3. Project Impacts

Table 4-5. Impacts to Jurisdictional Areas

Jurisdictional Area	Impacts (Permanent/Temporary) (acres)				
	Western Alignment Alternative	Central Alignment Alternative	Eastern Alignment Alternative	Roundabout Alignment Alternative	JPA Mitigation Area
USACE/RWQCB					
Wetland waters of the U.S.	0.83/0.55	1.50/0.38	0.99/1.09	1.11/1.15	0/0[1]
Adjacent Wetland	1.93/0.5	2.19/0.56	1.64/0.55	3.11/0.68	0/0
Non-wetland waters of the U.S.	0/0	0/0	0.01/0.01	0.01/0.01	0/0

Table 4-5, continued

Jurisdictional Area	Impacts (Permanent/Temporary) (acres)				
	Western Alignment Alternative	Central Alignment Alternative	Eastern Alignment Alternative	Roundabout Alignment Alternative	JPA Mitigation Area
Total Impacts – USACE/ RWQCB Jurisdictional	**2.76/0.6**	**3.69/0.94**	**2.64/1.65**	**4.23/1.84**	**0/0**
CDFW					
CDFW state streambed	0.83/0.64	1.50/0.37	0.99/1.10	1.11/1.13	0/0
CDFW Riparian habitat	2.09/0.5	2.17/0.56	1.85/0.63	3.52/0.68	0.11/2.0
Total Impacts – CDFW Jurisdictional	**2.92/1.14**	**3.67/0.93**	**2.84/1.73**	**4.63/1.81**	**0.11/2.0**

[1] Jurisdictional areas within areas proposed for enhancement are not considered impacted.

4.2.3.1. Western Alignment Alternative

The Western Alignment Alternative would result in permanent impacts to 2.76 ac and temporary impacts to 0.6 ac of USACE/RWQCB jurisdictional areas. This includes permanent impacts to 0.83 ac and temporary impacts to 0.55 ac of wetland waters of the U.S., and permanent impacts to 1.93 ac and temporary impacts to 0.5 ac of adjacent wetlands (Figure 9a).

The Western Alignment Alternative would also result in permanent impacts to 2.92 ac and temporary impacts to 1.14 ac of CDFW jurisdictional areas. This includes 0.83 ac of permanent impacts and 0.64 ac of temporary impacts to CDFW state streambed, and 2.09 ac of permanent impacts and 0.50 ac of temporary impacts to CDFW riparian habitat (Figure 9a).

4.2.3.2. Central Alignment Alternative

The Central Alignment Alternative would result in permanent impacts to 3.69 ac and temporary impacts to 0.94 ac of USACE jurisdictional areas. This includes permanent impacts to 1.50 ac and temporary impacts to 0.38 ac of wetland waters of the U.S., and permanent impacts to 2.19 ac and temporary impacts to 0.56 ac of adjacent wetlands (Figure 9b).

The Central Alignment Alternative would also result in permanent impacts to 3.67 ac and temporary impacts to 0.93 ac of CDFW jurisdictional areas. This includes 1.50 ac of permanent impacts and 0.37 ac of temporary impacts to CDFW state streambed, and 2.17 ac of permanent impacts and 0.56 ac of temporary impacts to CDFW riparian habitat (Figure 9b).

4.2.3.3. Eastern Alignment Alternative

The Eastern Alignment Alternative would result in permanent impacts to 2.64 ac and temporary impacts to 1.65 ac of USACE jurisdictional areas. This includes permanent impacts to 0.99 ac and temporary impacts to 1.09 ac of wetland waters of the U.S., permanent impacts to 1.64 ac and temporary impacts to 0.55 ac of adjacent wetlands, and permanent impacts to 0.01 ac and temporary impacts to 0.01 ac of non-wetland waters of the U.S. (Figure 9c).

The Eastern Alignment Alternative would also result in permanent impacts to 2.84 ac and temporary impacts to 1.73 ac of CDFW jurisdictional areas. This includes 0.99 ac of permanent impacts and 1.10 ac of temporary impacts to CDFW state streambed, and 1.85 ac of permanent impacts and 0.63 ac of temporary impacts to CDFW riparian habitat (Figure 9c).

4.2.3.4. Roundabout Alignment Alternative

The Roundabout Alignment Alternative would result in permanent impacts to 4.23 ac and temporary impacts to 1.84 ac of USACE jurisdictional areas. This includes permanent impacts to 1.11 ac and temporary impacts to 1.15 ac of wetland waters of the U.S., permanent impacts to 3.11 ac and temporary impacts to 0.68 ac of adjacent wetlands, and permanent impacts to 0.01 ac and temporary impacts to 0.01 ac of non-wetland waters of the U.S. (Figure 9d).

The Roundabout Alignment Alternative would also result in permanent impacts to 4.63 ac and temporary impacts to 1.81 ac of CDFW jurisdictional areas. This includes 1.11 ac of permanent impacts and 1.13 ac of temporary impacts to CDFW state streambed, and 3.52 ac of permanent impacts and 0.68 ac of temporary impacts to CDFW riparian habitat (Figure 9d).

4.2.3.5. JPA Mitigation Area

Implementation of the proposed wetland creation/enhancement at the JPA mitigation area would result in the conversion of vegetation communities within 02.11 ac of CDFW jurisdictional habitat (Figure 9e). This includes permanent impacts to 0.11 ac from construction of the berm and temporary impacts to 2.0 ac associated with wetland creation on the mitigation site. Mitigation for impacts to 0.11 ac of tamarisk scrub is provided at 2:1 through the creation and enhancement of mule-fat scrub/southern willow scrub on the JPA mitigation area. Mitigation for temporary impacts will be accomplished at a 1:1 ratio through conversion to higher quality wetlands.

4.2.4. Compensatory Mitigation

Unavoidable impacts to resources under the jurisdiction of the USACE, RWQCB, and CDFW will require permits/approval from these agencies and implementation of associated mitigation measures. The City currently proposes to mitigate the Project's impacts to jurisdictional resources through implementation of the conceptual restoration plan at the JPA mitigation area. Additional mitigation opportunities for wetland habitat have been identified in the Project vicinity. Implementation of the conceptual restoration plan and additional mitigation lands would ensure no net loss to jurisdictional resources and would result in a net gain of jurisdictional resources such that the required mitigation measures outlined in Tables 4-1 through 4-4 are met.

In addition, the Project's limits of disturbance, including the upstream, downstream, and lateral extents, would be clearly defined and marked in the field. Monitoring personnel would review the identified limits of disturbance prior to initiation of construction activities and would monitor to ensure compliance.

4.2.5. Cumulative Impacts

Implementation of the proposed Project and recent and foreseeable projects in the vicinity of the BSA would not result in adverse cumulative impacts to waters of the U.S. and state streambeds. These impacts would be mitigated through compensation that fully replaces the relevant functions and values at a watershed level under the permitting processes of Section 404 of the CWA and Section 1602 of the State Streambed Alteration Program. The amount of jurisdictional resources that have been removed from past projects is not known, but it is expected to be measurable and it is reasonable to expect that some of the proposed projects would remove such resources. Other projects that could contribute to impacts to jurisdictional areas in the vicinity would also be required to comply with mitigation measures and permit requirements as described above.

4.3. Special-Status Plant Species

Special-status plant species are known to occur within the region. The following sections provide the results of the habitat evaluations, focused survey work, and relevant regulatory analysis. Focused surveys for special-status plant species were conducted in April, May, and August of 2009. During surveys conducted in 2009 and 2011, four special-status plant species (Appendix A) were detected in or immediately adjacent to the BSA. All special-status plant species detected in or adjacent to the BSA during surveys conducted in support of this Project are presented in Table 4-6.

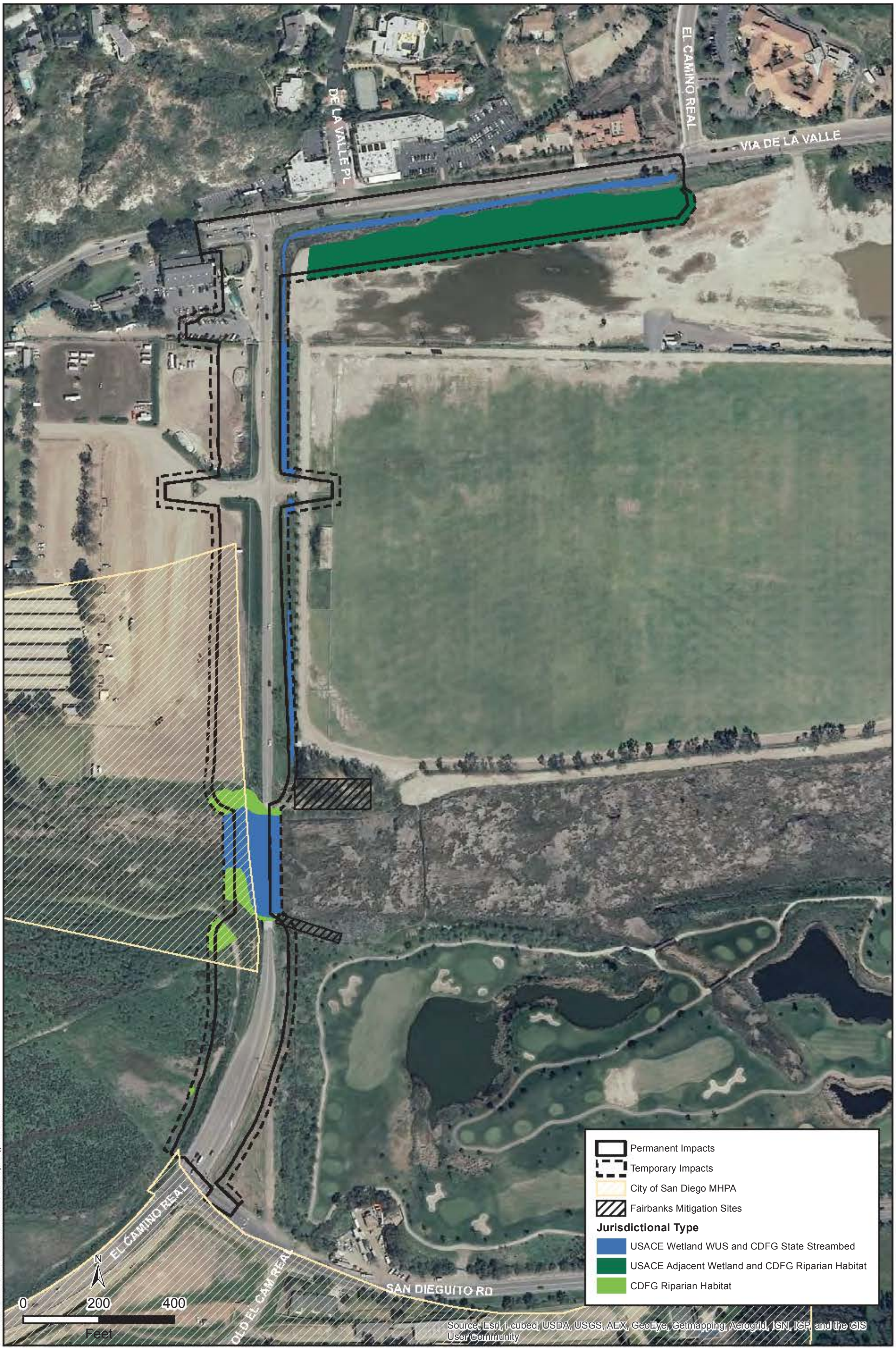

Figure 7a
Jurisdictional Areas Western Alternative
El Camino Real Bridge Replacement Project

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Figure 9b
Jurisdictional Areas Central Alternative
El Camino Real Bridge Replacement Project

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Figure 9c
Jurisdictional Areas Eastern Alternative
El Camino Real Bridge Replacement Project

Figure 9d
Jurisdictional Areas Roundabout Alternative
El Camino Real Bridge Replacement Project

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Figure 9e
Jurisdictional Areas JPA Mitigation Area
El Camino Real Bridge Replacement Project

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Table 4-6. Special-Status Plant Species Detected Within or Adjacent to the BSA

Common Name *(Scientific Name)*	Status	Habitat In Which Detected	Discussion
Palmer's sagewort *(Artemisia palmeri)*	CRPR 4.2	Disturbed area	Detected: ▪ Western Alignment Alternative – 4 individuals ▪ Central Alignment Alternative – 4 individuals
San Diego sunflower *(Bahiopsis laciniata)*	CRPR 4.2	Disturbed Diegan coastal sage scrub	Detected: ▪ Roundabout Alignment Alternative – 16 individuals and a 0.03-acre patch
San Diego marsh-elder *(Iva hayesiana)*	CRPR 2.2	Tamarisk scrub and an ornamental area	Detected: ▪ Western Alignment Alternative – 1 individual ▪ JPA mitigation area – 6 individuals
Southwestern spiny rush *(Juncus acutus* ssp. *Leopoldii)*	CRPR 4.2	Coastal freshwater marsh, mule-fat scrub, and tamarisk scrub	Detected: ▪ Central Alignment Alternative – 2 individuals ▪ Eastern Alignment Alternative – 41 individuals ▪ Roundabout Alignment Alternative – 41 individuals ▪ JPA mitigation area – 1 individual

CRPR = California Rare Plant Rank

4.3.1. Palmer's Sagewort

Palmer's sagewort is a perennial shrub that typically occurs along moist drainages in riparian forests and scrubs but can also be found in mesic chaparral and coastal sage scrub conditions, typically at elevations below 1,000 m (3,000 ft). This species blooms from July to September. Palmer's sagewort is a California Rare Plant Rank (CRPR) 4.2 species. Plants afforded the 4 rank are considered to be of limited distribution or infrequent in California but are not considered "rare" in the state. The 0.2 threat rank indicates that this species is fairly threatened in California.

4.3.1.1. Survey Results

One small patch comprised of four individuals of Palmer's sagewort was detected in a disturbed area in the BSA, west of El Camino Real and north of the San Dieguito River (Figures 6a and 6b). This small patch is not considered to be part of a regionally important population, and, as such, the loss of these plants would not threaten the long-term survival of this species in the region or within the MSCP subarea.

4.3.1.2. Avoidance and Minimization

Prior to removal of vegetation, orange snow fencing would be installed to demarcate the Project footprint in order to avoid encroachment into surrounding sensitive areas. Furthermore, a qualified biologist would monitor construction activities for the duration of the Project to ensure that practicable measures are being employed to avoid incidental disturbance of special-status species outside of the Project footprint.

4.3.1.3. Project Impacts

Western Alignment Alternative

Impacts to four individuals of Palmer's sagewort would result from construction of the Western Alignment Alternative because this species occurs within the alignment (Figure 6a). The loss of these plants would not threaten the regional long-term survival of this species in the region or within the MSCP subarea.

Central Alignment Alternative

Impacts to four individuals of Palmer's sagewort would result from construction of the Central Alignment Alternative because this species occurs within the alignment (Figure 6b). The loss of this small patch would not threaten the regional long-term survival of this species in the region or within the MSCP subarea.

Eastern Alignment Alternative

No impacts to Palmer's sagewort would result from construction of the Eastern Alignment Alternative because this species does not occur within the alignment.

Roundabout Alignment Alternative

No impacts to Palmer's sagewort would result from construction of the Roundabout Alignment Alternative because this species does not occur within the alignment.

JPA Mitigation Area

No impacts to Palmer's sagewort would result from implementation of the proposed wetland creation/enhancement within the JPA mitigation area because individuals of this species do not occur within the JPA mitigation area.

4.3.1.4. Compensatory Mitigation

Palmer's sagewort would be included in the plant palette used in the creation and enhancement of southern willow scrub/mule-fat scrub in the JPA mitigation area. Final success criteria for the JPA mitigation area will require the presence of Palmer's sagewort prior to final site signoff.

4.3.1.5. Cumulative Effects

Although the Project would result in impacts to individuals of Palmer's sagewort, such impacts would not substantially contribute to potential adverse cumulative impacts to this species in the BSA.

4.3.2. San Diego Sunflower

San Diego Sunflower is associated with arid Diegan coastal sage scrub at a variety of elevations and soil types. In San Diego County, its distribution extends primarily from south of Highway 78 to the international border with Mexico. This species is a CRPR 4.2 plant species. Plants afforded the 4 rank are considered to be of limited distribution or infrequent in California, but are not considered "rare" in the state. The 0.2 threat rank indicates that this species is fairly threatened in California.

4.3.2.1. Survey Results

In the BSA, 16 individuals of San Diego sunflower and a 0.03-ac patch were detected in disturbed Diegan coastal sage scrub, south of the El Camino Real and San Dieguito Road intersection (Figure 6d). This population is not considered a regionally important population. The loss of these plants would not threaten the long-term survival of this species in the region or within the MSCP subarea.

4.3.2.2. Avoidance and Minimization Efforts

Prior to removal of vegetation, orange snow fencing would be installed to demarcate the Project footprint in order to avoid encroachment into surrounding sensitive areas. A qualified biologist would monitor construction activities for the duration of the Project to ensure that practicable measures are being employed to avoid incidental disturbance of special-status species outside of the Project footprint.

4.3.2.3. Project Impacts

Western Alignment Alternative

No impacts to San Diego sunflower would result from construction of the Western Alignment Alternative because this species does not occur within the alignment.

Central Alignment Alternative

No impacts to San Diego sunflower would result from construction of the Central Alignment Alternative because this species does not occur within the alignment.

Eastern Alignment Alternative

No impacts to San Diego sunflower would result from construction of the Eastern Alignment Alternative because this species does not occur within the alignment.

Roundabout Alignment Alternative

Impacts to 16 individuals and a 0.03-ac patch of San Diego sunflower would result from the Roundabout Alignment Alternative (Figure 6d). The species occurs within the southern portion of the alignment. The loss of these plants in the small area that they occupy within the BSA would not threaten the long-term survival of this species in the region or within the MSCP subarea.

JPA Mitigation Area

No impacts to San Diego sunflower would result from construction of the JPA mitigation area.

4.3.2.4. Compensatory Mitigation

Habitat-based mitigation would be provided for impacts to disturbed Diegan coastal sage scrub, the vegetation community on site in which the San Diego sunflower is found, at a 1:1 ratio.

4.3.2.5. Cumulative Effects

Although the Project would result in impacts to individuals of San Diego sunflower, such impacts would not substantially contribute to potential adverse cumulative impacts to this species in the Project area.

4.3.3. San Diego Marsh-Elder

San Diego marsh-elder is a perennial wetland shrub that typically occurs in creeks or intermittent streambed habitats and marsh habitat. Appropriate habitat for this species consists of low growing shrubs with an open canopy with sandy alluvial embankments. This species blooms from April through October. San Diego marsh-elder is a CRPR 2.2 species. Plants afforded the 2 rank are considered to be rare, threatened, or endangered in California, but more common elsewhere. The 0.2 threat rank indicates that this species is fairly threatened in California.

4.3.3.1. Survey Results

Within the BSA, six individuals of San Diego marsh-elder occur along the periphery of disturbed southern willow scrub located along the San Dieguito River, within tamarisk scrub and an ornamental area south of the river (Figures 6a and 6e). San Diego marsh elder located within the Project alignment is not a regionally significant population. Project impacts to San Diego marsh elder would not threaten the long-term survival of this species in the region or within the MSCP subarea.

4.3.3.2. Avoidance and Minimization Efforts

Prior to removal of vegetation, orange snow fencing would be installed to demarcate the Project footprint in order to avoid encroachment into surrounding sensitive areas. A qualified biologist would monitor construction activities for the duration of the Project to ensure that practicable measures are being employed to avoid incidental disturbance of special-status species outside of the Project footprint. Within the JPA mitigation area (Figure 6e), San Diego marsh-elder occurring within areas to be enhanced would be flagged or fenced to ensure that these individuals are not removed by work crews and are instead incorporated into the enhancement areas.

4.3.3.3. Project Impacts

Western Alignment Alternative

Impacts to one individual San Diego marsh-elder would result from construction of the Western Alignment Alternative because this species exists within the alignment (Figure 6a). Project impacts to San Diego marsh elder would not threaten the long-term survival of this species in the region or within the MSCP subarea.

Central Alignment Alternative

No impacts to San Diego marsh-elder would result from construction of the Central Alignment Alternative because this species does not exist within the alignment.

Eastern Alignment Alternative

No impacts to San Diego marsh-elder would result from construction of the Eastern Alignment Alternative because this species does not occur within the alignment.

Roundabout Alignment Alternative

No impacts to San Diego marsh-elder would result from construction of the Roundabout Alignment Alternative because this species does not occur within the alignment.

JPA Mitigation Area

Within the limits of the JPA mitigation area there are six individuals of San Diego marsh-elder (Figure 6e) situated in tamarisk scrub and an ornamental area that would be impacted by mitigation activities. Project impacts to San Diego marsh elder would not threaten the long-term survival of this species in the region or within the MSCP subarea.

4.3.3.4. Compensatory Mitigation

San Diego marsh-elder would be included in the plant palette used in the creation and enhancement of southern willow scrub/mule-fat scrub in the JPA mitigation area. Final success criteria for the JPA mitigation area will require the presence of San Diego marsh-elder prior to final site signoff.

4.3.3.5. Cumulative Impacts

Although the Project would result in impacts to individuals of San Diego marsh elder, such impacts would not substantially contribute to potential adverse cumulative impacts to this species in the Project area.

4.3.4. Southwestern Spiny Rush

Southwestern spiny rush is a perennial shrub that is typically found in alkaline meadows, coastal salt marshes, and riparian marshes below 3,000 ft. This plant blooms from May through June. It is a CRPR 4.2 plant species. Plants afforded the list 4 designation are considered to be of limited distribution or infrequent in California but are not considered “rare” in the state. The 0.2 threat rank indicates that this species is fairly threatened in California.

4.3.4.1. Survey Results

Within the BSA, 68 individuals of southwestern spiny rush were detected within mule-fat scrub and coastal freshwater marsh in the San Dieguito River east of El Camino Real (Figures 6b–6d) and in tamarisk scrub west of El Camino Real (Figure 6e). Southwestern spiny rush associated with the San Dieguito River do not comprise a regionally significant population. The loss of southwestern spiny rush occurring along this alignment would not threaten the long-term survival of this species in the region or within the MSCP subarea.

4.3.4.2. Avoidance and Minimization Efforts

Prior to removal of vegetation, orange snow fencing would be installed to demarcate the Project footprint in order to avoid encroachment into surrounding sensitive areas. A qualified biologist would monitor construction activities for the duration of the Project to ensure that practicable measures are being employed to avoid incidental disturbance of special-status species outside of the Project footprint. Within the JPA mitigation area (Figure 6e), southwestern spiny rush occurring within areas to be enhanced would be flagged or fenced to ensure that these individuals are not removed by work crews and are instead incorporated into the enhancement areas.

4.3.4.3. Project Impacts

Western Alignment Alternative

No impacts to southwestern spiny rush would result from construction of the Western Alignment Alternative because this species does not occur within the alignment.

Central Alignment Alternative

Impacts to two individuals of southwestern spiny rush would result from construction of the Central Alignment Alternative because this species occurs within the alignment (Figure 6b). The loss of southwestern spiny rush along this alignment would not threaten the long-term survival of this species in the region or within the MSCP subarea.

Eastern Alignment Alternative

Impacts to 41 individuals of southwestern spiny rush would result from construction of the Eastern Alignment Alternative because this species occurs within the alignment (Figure 6c). The loss of these individuals would not threaten the long-term survival of this species in the region or within the MSCP subarea.

Roundabout Alignment Alternative

Impacts to 41 individuals of southwestern spiny rush would result from construction of the Roundabout Alignment Alternative because this species occurs within the alignment (Figure 6d). The loss of these individuals would not threaten the long-term survival of this species in the region or within the MSCP subarea.

JPA Mitigation Area

Within the limits of the JPA mitigation area, one individual of southwestern spiny rush occurs in tamarisk scrub and would be impacted by mitigation activities (Figure 6e).Project impacts to southwestern spiny rush would not threaten the long-term survival of this species in the region or within the MSCP subarea.

4.3.4.4. Compensatory Mitigation

Southwestern spiny rush would be included in the plant palette used in the creation of coastal freshwater marsh in the JPA mitigation area. Final success criteria for the JPA mitigation area will require the presence of southwestern spiny rush prior to final site signoff. Furthermore, habitat-based mitigation would be offered for impacts to coastal freshwater marsh and mule-fat scrub supporting southwestern spiny rush.

4.3.4.5. Cumulative Effects

Although the Project would result in impacts to individuals of southwestern spiny rush, such impacts would not substantially contribute to potential adverse cumulative impacts to this species in the Project area.

4.4. Special-Status Animal Species Occurrences

Special-status wildlife species are known to occur within the region. The following sections provide the results of the habitat evaluations, focused survey work, and relevant regulatory analysis. During surveys conducted in 2009, seven special-status wildlife species were detected in or immediately adjacent the BSA (Appendix B). All species detected in or adjacent to the BSA during surveys conducted in support of this Project are presented below and outlined in Table 4-7.

Table 4-7. Special-Status Wildlife Species Detected Within or Adjacent to the BSA

Common Name (Scientific Name)	Status	Habitat In Which Detected	Detected In
Northern harrier (*Circus cyaneus*)	SSC	Grasslands and marshes	▪ JPA mitigation area
Clark's marsh wren (*Cistothorus palustris clarkae*)	SSC	Coastal freshwater marsh	▪ Western Alignment Alternative ▪ Central Alignment Alternative ▪ Eastern Alignment Alternative ▪ Roundabout Alignment Alternative
Yellow warbler (*Dendroica petechia*)	SSC	Riparian scrub	▪ JPA mitigation area
White-tailed kite (*Elanus leucurus*)	CFP	Open grasslands, agricultural areas, wetlands, and oak woodlands	▪ JPA mitigation area (foraging overhead)
Yellow-breasted chat (*Icteria virens*)	SSC	Riparian scrub	▪ Eastern Alignment Alternative ▪ Roundabout Alignment Alternative
Light-footed clapper rail (*Rallus longirostris levipes*)	FE, SE, CFP	Coastal freshwater marsh	▪ Western Alignment Alternative ▪ Central Alignment Alternative ▪ Eastern Alignment Alternative ▪ Roundabout Alignment Alternative ▪ JPA mitigation area
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE	Riparian scrub	▪ Western Alignment Alternative ▪ Central Alignment Alternative ▪ Eastern Alignment Alternative ▪ Roundabout Alignment Alternative ▪ JPA mitigation area
Status: FE = Federally endangered SE = State endangered SSC = State Species of Special Concern CFP = State Fully Protected			

4.4.1. Northern Harrier

The northern harrier is associated with open grassland and marshes. This species typically forages in open, undisturbed habitat and nests on the ground in areas of dense low-growing vegetation that conceals its nest. Northern harrier nesting occurs between April and May (Unitt 2004). Nesting harriers are now considered rare and the known breeding population in San Diego County is estimated at 25 to 75 pairs. Similar to other ground nesting grassland birds, the northern harrier population is on the decline due to urban sprawl (Unitt 2004).

4.4.1.1. Survey Results

A single male harrier was detected in the BSA foraging in disturbed land situated within the JPA mitigation area (Figure 6e).

4.4.1.2. Avoidance and Minimization Efforts

In order to avoid and minimize impacts to nesting bird species in the BSA, mitigation and construction activities occurring outside of the river corridor would be restricted during the nesting season (February 1 through August 31) in accordance with the MBTA and City of San Diego policies. If vegetation removal is to occur between February 1 and August 31, a nesting bird survey would be conducted prior to removal of vegetation be (see Section 5.2). According to the City of San Diego Biology Guidelines (City of San Diego 2002), for areas within the MHPA, a 900-foot buffer would be placed around the nesting site of northern harrier, and no construction activities would occur within the buffer until the nest is no longer active.

4.4.1.3. Project Impacts

Western Alignment Alternative

No direct or indirect impacts to northern harrier or its habitat would occur as a result of the Western Alignment Alternative. Northern harrier was not detected within this alignment; furthermore, this alternative does not support suitable habitat for this species.

Central Alignment Alternative

No direct or indirect impacts to northern harrier or its habitat would occur as a result of the Central Alignment Alternative. Northern harrier was not detected within this alignment; furthermore, this alternative does not support suitable habitat for this species.

Eastern Alignment Alternative

No direct or indirect impacts to northern harrier or its habitat would occur as a result of the Eastern Alignment Alternative. Northern harrier was not detected within this alignment; furthermore, this alternative does not support suitable habitat for this species.

Roundabout Alignment Alternative

No direct or indirect impacts to northern harrier or its habitat would occur as a result of the Roundabout Alignment Alternative. Northern harrier was not detected within this alignment; furthermore, this alternative does not support suitable habitat for this species.

JPA Mitigation Area

The JPA mitigation area contains suitable nesting and foraging habitat for the northern harrier, and this species was observed during the biological surveys (Figure 6e). Direct impacts would be avoided through Project restrictions during the northern harrier nesting season. Indirect impacts would not occur because foraging and potential nesting habitat in the JPA mitigation area would be enhanced or converted to higher quality habitat through implementation of the proposed conceptual restoration plan and, thus, is not considered impacted.

Northern harriers foraging in the Project area during the non-breeding season (September 1 through February 14) will be subjected to indirect impacts of noise and vibration from hydraulic pile driving activities. It is possible that this mobile species will relocate should such indirect impacts prove disruptive; however, it is also possible that noise and vibration will not prove disruptive. It is not anticipated that indirect impacts will result in harm to northern harrier.

4.4.1.4. Compensatory Mitigation

The avoidance and minimization measures stated in Section 4.4.1.2 would be implemented to ensure that direct Project impacts to northern harrier are avoided. The proposed habitats that would be created within the JPA mitigation area would provide suitable foraging habitat and potentially suitable nesting habitat for this species.

4.4.1.5. Cumulative Impacts

The proposed Project would not result in significant cumulative impacts to northern harrier.

4.4.2. Clark's Marsh Wren

The Clark's marsh wren, a SSC, is a small, stocky insectivorous bird with a relatively long bill. This subspecies is a year-long resident of freshwater and brackish marshes along and near the coast in southern coastal California. Although this species has suffered from the destruction of coastal wetland habitat, it has also benefited from the installation of ponds and reservoirs (Unitt 2004). State species of special concern are considered to be vulnerable to extinction due to declining populations, limited ranges, and/or continuing threats.

4.4.2.1. Survey Results

Clark's marsh wren was detected in the BSA in coastal freshwater marsh occurring within the San Dieguito River (Figures 6a-6d).

4.4.2.2. Avoidance and Minimization

In order to avoid impacts to special-status bird species occurring in the Project area, mitigation and construction activities occurring within the river corridor would be restricted during the combined nesting seasons (February 1 through September 30). No clearing or grubbing of riparian habitat would be allowed between February 1 and September 30.

4.4.2.3. Project Impacts

Western Alignment Alternative

Clark's marsh wren was detected in the Western Alignment Alternative alignment along El Camino Real in areas of disturbed coastal freshwater marsh associated with the San Dieguito River (Figure 6a). Direct impacts to Clark's marsh wren are not anticipated because all Project activities would be restricted during the breeding season. Freshwater marsh provides suitable nesting and foraging habitat for the marsh wren and would be impacted by the construction of the Western Alignment Alternative. Impacts to suitable freshwater marsh habitat are considered indirect impacts to Clark's marsh wren.

Central Alignment Alternative

Clark's marsh wren was detected in the Central Alignment Alternative alignment along El Camino Real in areas of disturbed coastal freshwater marsh associated with the San Dieguito River (Figure 6b). The Central Alignment Alternative alignment also would result in impacts to coastal freshwater marsh that is considered suitable Clark's marsh wren nesting and foraging habitat. Thus, indirect impacts to this species would result from construction of the Central Alignment Alternative. However, direct impacts to Clark's marsh wren would not occur because all Project impacts to coastal freshwater marsh would be restricted during the breeding season.

Eastern Alignment Alternative

Clark's marsh wren was detected in the Eastern Alignment Alternative alignment along El Camino Real in areas of disturbed coastal freshwater marsh associated with the San Dieguito River (Figure 6c). The proposed Eastern Alignment Alternative alignment also would result in impacts to coastal freshwater marsh that is considered suitable Clark's marsh wren nesting and foraging habitat. Thus, indirect impacts to this species would result from construction of the Eastern Alignment Alternative. However, direct impacts to Clark's marsh wren would not occur because all Project-related impacts to coastal freshwater marsh would be restricted during the breeding season.

Roundabout Alignment Alternative

Clark's marsh wren was detected in the Roundabout Alignment Alternative alignment along El Camino Real in areas of disturbed coastal freshwater marsh associated with the San Dieguito River (Figure 6d). The Roundabout Alignment Alternative alignment also would result in impacts to coastal freshwater marsh that is considered suitable Clark's marsh wren nesting and foraging habitat. Thus, indirect impacts to this species would result from construction of the Roundabout Alignment Alternative. However, direct impacts to Clark's marsh wren would not occur because all Project-related impacts to coastal freshwater marsh would be restricted during the breeding season.

JPA Mitigation Area

Small areas of suitable nesting and foraging habitat for Clark's marsh wren exist within the JPA mitigation area. Direct impacts to Clark's marsh wren would not occur because all Project-related activities in coastal freshwater marsh adjacent to the San Dieguito River would be restricted during the breeding season. Indirect impacts would not occur because coastal freshwater marsh in the JPA mitigation area would be enhanced through implementation of the proposed wetland creation/enhancement plan and, thus, is not considered impacted.

Clark's marsh wren foraging in the Project area during the non-breeding season (September 1 through February 14) will be subjected to indirect impacts of noise and vibration from hydraulic pile driving activities. It is possible that this mobile species will relocate should such indirect impacts prove disruptive; however, it is also possible that noise and vibration will not prove disruptive. It is not anticipated that indirect impacts will result in harm to Clark's marsh wren.

4.4.2.4. Compensatory Mitigation

No direct impacts to Clark's marsh wren are anticipated. The avoidance and minimization measures stated in Section 4.4.2.2 are intended to serve as mitigation measures for indirect impacts to Clark's marsh wren.

Habitat-based mitigation would be provided for indirect impacts to Clark's marsh wren. In the Project area, potential Clark's marsh wren habitat consists of coastal freshwater marsh associated with the San Dieguito River. Anticipated Project impacts to coastal freshwater marsh would be mitigated at a 4:1 ratio. Mitigation would be accomplished within the San Dieguito River watershed.

4.4.2.5. Cumulative Effects

The proposed Project is not expected to result in significant cumulative impacts to Clark's marsh wren. This species is still fairly common in San Diego County (Unitt 2004), and the Clark's marsh wren detected in the Project area does not represent a population of regional importance.

4.4.3. Yellow Warbler

The yellow warbler, a SSC, is a small insectivorous migratory passerine that inhabits lowland and foothill mature riparian woodlands (Unitt 2004). Preferred plant species include cottonwoods (*Populus* spp.), willows (*Salix* spp.), and other small trees and shrubs typically found in open-canopy riparian woodlands. They are usually on their breeding grounds from late March to mid-October. Destruction and degradation of riparian habitat and brood parasitism by the brown-headed cowbird led to the decline of this species (Unitt 2004).

4.4.3.1. Survey Results

Yellow warbler was detected in the BSA in disturbed southern willow scrub occurring adjacent to the San Dieguito River (Figure 6e).

4.4.3.2. Avoidance and Minimization

Direct impacts to yellow warbler would be avoided. Mitigation and construction activities within the river corridor would be restricted between February 1 through September 30 to include, and thereby avoid, the nesting seasons of all potentially occurring special-status bird species. No clearing or grubbing of riparian habitat would be allowed between February 1 and September 30.

4.4.3.3. Project Impacts

Project Alternatives

No direct impacts to yellow warbler would occur as a result of construction of any of the four Project alternatives. The yellow warbler was not detected within any of the four alignments. All Project activities within areas that provide potentially suitable nesting and foraging habitat would be restricted during the yellow warbler's breeding season.

Disturbed southern willow scrub provides suitable nesting and foraging habitat for the yellow warbler and would be impacted by the construction of all four alternatives. Thus, impacts to disturbed southern willow scrub habitat are considered indirect impacts to yellow warbler.

JPA Mitigation Area

Yellow warbler was detected in the JPA mitigation area along El Camino Real in areas of disturbed coastal freshwater marsh associated with the San Dieguito River (Figure 6e). Suitable nesting and foraging habitat for yellow warbler exists within the JPA mitigation area. Direct impacts to yellow warbler would not occur because all Project-related activities in southern willow scrub would be restricted during the breeding season. Indirect impacts would not occur because southern willow scrub in the JPA mitigation area would be enhanced through implementation of the proposed wetland creation/enhancement plan and, thus, is not considered impacted.

Yellow warbler is a migratory species that would be unlikely to occur in the Project area during the non-breeding season. Therefore, indirect impacts of noise and vibration from hydraulic pile driving activities are not anticipated.

4.4.3.4. Compensatory Mitigation

No direct impacts to yellow warbler are anticipated. The avoidance and minimization measures stated in Section 4.4.3.2 are intended to serve as mitigation measures for indirect impacts to yellow warbler.

Habitat-based mitigation would be provided for indirect impacts to yellow warbler. To offset anticipated Project impacts to disturbed southern willow scrub that serves as potential yellow warbler habitat, impacts to disturbed southern willow scrub would be mitigated at a ratio exceeding 3:1 ratio. Mitigation would be accomplished in the JPA mitigation area through creation and enhancement of southern/willow scrub/mule-fat scrub within the San Dieguito River watershed.

4.4.3.5. Cumulative Effects

The proposed Project is not expected to result in significant cumulative impacts to yellow warbler. This species is still fairly common in San Diego County (Unitt 2004), and the individuals detected do not represent a regionally significant population.

4.4.4. White-tailed Kite

The white-tailed kite is found in lower elevations in open grasslands, agricultural areas, wetlands, and oak woodlands. Their primary source of food is the California vole (*Microtus californicus sanctidiegi*) (Unitt 2004). It typically forages in open undisturbed habitats and nests in the tops of dense oak, willow, or other large trees. Nesting can begin as early as January (outside of the combined nesting season) and extend through May (Unitt 2004). The white-tailed kite population has declined as a result of urban sprawl; however, this species is still considered fairly widespread throughout the foothills of San Diego County (Unitt 2004).

4.4.4.1. Survey Results

A single male white-tailed kite was detected in the BSA foraging in a disturbed area situated within the JPA mitigation area (Figure 6e).

4.4.4.2. Avoidance and Minimization Efforts

If vegetation removal occurs between January and February 14, prior to the combined nesting season but within the white-tailed kite nesting season, a preconstruction nesting bird survey for raptors and other early nesting species would be conducted. If a nest is found, a wildlife buffer would be established around the nest until the adults are no longer using it or the young have fledged. No work would be permitted within this area. The specific buffer width would be determined by a qualified biologist at the time of discovery and would vary based on site conditions and type of work necessary.

Mitigation and construction activities within the river corridor would be restricted during the combined nesting season (February 1 through September 30) of all special-status bird species, thereby avoiding impacts to the white-tailed kite during this time. No clearing or grubbing of riparian habitat would be allowed between February 1 and September 30.

4.4.4.3. PROJECT IMPACTS

Project Alternatives

No direct or indirect impacts to white-tailed kite or its habitat would result from the construction of any of the Project alternatives. Suitable nesting and foraging habitat for this species does not occur within any of the four alignments.

JPA Mitigation Area

White-tailed kite was detected in the JPA mitigation area (Figure 6e). Suitable foraging habitat for white-tailed kite exists within the JPA mitigation area. Impacts to disturbed areas utilized by the kite for foraging are considered indirect impacts to the white-tailed kite. Suitable nesting habitat for this species does not occur within the JPA mitigation area. No direct impacts to white-tailed kite would result from construction of the JPA mitigation area.

White-tailed kite foraging in the project area during the non-breeding season (September 1 through February 14) will be subjected to indirect impacts of noise and vibration from hydraulic pile driving activities. It is possible that this mobile species will relocate should such indirect impacts prove disruptive; however, it is also possible that noise and vibration will not prove disruptive. It is not anticipated that indirect impacts will result in harm to White-tailed kite.

4.4.4.4. COMPENSATORY MITIGATION

No direct impacts to white-tailed kite are anticipated. The avoidance and minimization measures stated in Section 4.4.4.2 are intended to serve as mitigation measures for indirect impacts to white-tailed kite. Project impacts to disturbed areas associated with the JPA mitigation area do not preclude the use of other portions of the San Dieguito River Valley as foraging grounds for the white-tailed kite. Indirect impacts would not occur because foraging habitat in the JPA mitigation area would be enhanced or converted to higher quality habitat through implementation of the proposed conceptual restoration plan and, thus, is not considered impacted.

4.4.4.5. CUMULATIVE IMPACTS

The proposed Project would not result in significant cumulative impacts to white-tailed kite. The proposed habitats that would be created within the JPA mitigation area would also provide suitable foraging habitat for this species.

4.4.5. Yellow-Breasted Chat

The yellow-breasted chat, a SSC, is a medium-sized insectivorous migratory passerine typically found in dense stands of riparian woodland with a well-developed understory. The yellow-breasted chat is usually detected on its breeding grounds from April to late September near edges of streams, swampy ground, or small ponds. The decline of this species is attributable to the loss of riparian habitat to development, agriculture, and channeling of water. However, the number of yellow-breasted chat in San Diego County has increased since the mid-1980s (Unitt 2004). State species of special concern are considered to be vulnerable to extinction due to declining populations, limited ranges, and/or continuing threats.

4.4.5.1. SURVEY RESULTS

Yellow-breasted chat was detected in the BSA in disturbed southern willow scrub occurring along the edge of the San Dieguito River (Figures 6c and 6d).

4.4.5.2. AVOIDANCE AND MINIMIZATION

In order to avoid impacts to special-status bird species, mitigation and construction activities within the river corridor would be restricted during the combined nesting season (February 1 through September 30) for these species. No clearing or grubbing of riparian habitat would be allowed between February 1 and September 30.

4.4.5.3. PROJECT IMPACTS

Western Alignment Alternative

No direct impacts to yellow-breasted chat are anticipated from construction of the Western Alignment Alternative. No yellow-breasted chats were observed within this alignment. The alignment includes disturbed southern willow scrub considered suitable nesting and foraging habitat for the yellow-breasted chat. All Project activities in areas of suitable habitat would be restricted during the breeding season. However, disturbed southern willow scrub associated with the San Dieguito River provides suitable nesting and foraging habitat for this species. Impacts to disturbed southern willow scrub within this alternative alignment are considered indirect impacts to yellow-breasted chat.

Central Alignment Alternative

No direct impacts to yellow-breasted chat are anticipated from construction of the Central Alignment Alternative. No yellow-breasted chats were observed within this alignment. Only small, isolated patches of disturbed southern willow scrub, not suitable for foraging or nesting habitat, would be impacted by this alternative alignment.

Eastern Alignment Alternative

Yellow-breasted chat was detected in the Eastern Alignment Alternative alignment (Figure 6c). No direct impacts to yellow-breasted chat are anticipated from construction of the Eastern Alignment Alternative. All Project activities in areas of suitable habitat would be restricted during the breeding season. However, disturbed southern willow scrub associated with the San Dieguito River provides suitable nesting and foraging habitat for this species. Impacts to disturbed southern willow scrub within this alternative alignment are considered indirect impacts to yellow-breasted chat.

Roundabout Alignment Alternative

Yellow-breasted chat was detected in the Roundabout Alignment Alternative alignment (Figure 6d). No direct impacts to yellow-breasted chat are anticipated from construction of the Roundabout Alignment Alternative. All Project activities would be restricted during the breeding season for this species. However, indirect impacts to yellow-breasted chat are anticipated as a result of Project impacts to disturbed southern willow scrub associated with the Roundabout Alignment Alternative alignment. This vegetation is considered to be suitable nesting and foraging habitat for yellow-breasted chat.

JPA Mitigation Area

No direct or indirect impacts to yellow-breasted chat are anticipated from construction of the JPA mitigation area. Suitable nesting and foraging habitat for yellow-breasted chat exists within the JPA mitigation area. However, direct impacts to yellow-breasted chat would not occur because all Project-related activities in southern willow scrub would be restricted during the breeding season. Indirect impacts would not occur because southern willow scrub in the JPA mitigation area would be enhanced through implementation of the proposed wetland creation/enhancement plan and, thus, is not considered impacted.

Yellow-breasted chat is a migratory species that would be unlikely to occur in the Project area during the non-breeding season. Therefore, indirect impacts of noise and vibration from hydraulic pile driving activities are not anticipated.

4.4.5.4. COMPENSATORY MITIGATION

No direct impacts to yellow-breasted chat are anticipated. The avoidance and minimization measures stated in Section 4.4.5.2 are intended to serve as mitigation measures for indirect impacts to yellow-breasted chat.

Habitat-based mitigation would be provided for indirect impacts to yellow-breasted chat. To offset anticipated Project impacts to disturbed southern willow scrub that serves as potential yellow-breasted chat habitat, disturbed southern willow scrub would be restored, created, or enhanced at a 3:1 ratio. Mitigation would be accomplished through implementation of the proposed restoration plan within the JPA mitigation area, which is within the San Dieguito River watershed.

4.4.5.5. CUMULATIVE EFFECTS

The proposed Project is not expected to result in significant cumulative impacts to yellow-breasted chat. The number of yellow-breasted chat detected in San Diego County has increased over time (Unitt 2004), and the individuals detected in the Project area do not represent a regionally significant population.

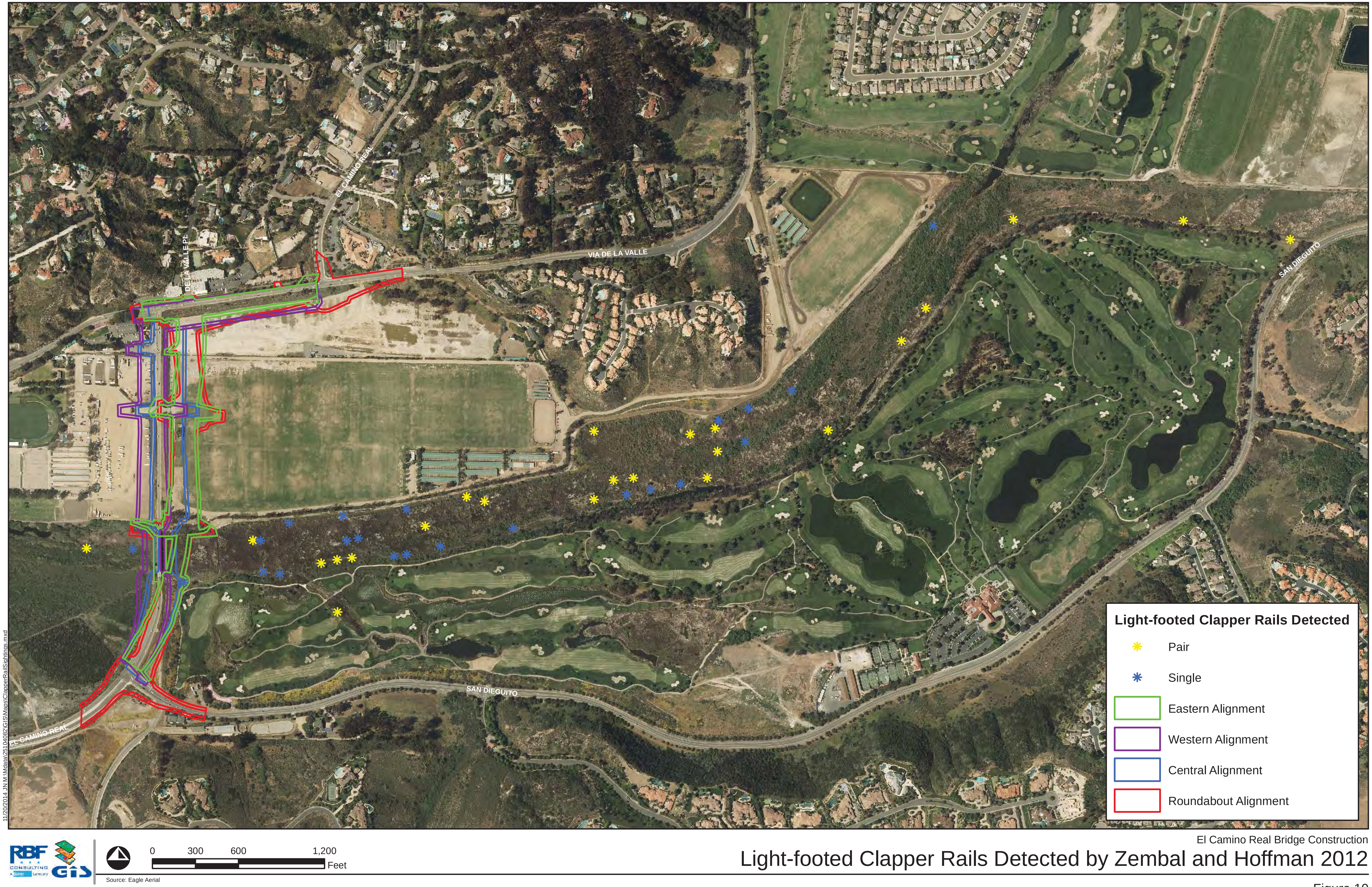
4.4.6. Light-Footed Clapper Rail

Light-footed clapper rail, federally and state-listed as endangered and fully protected, is a year-round resident of coastal salt marshes of the west coast (Unitt 1984), although this species is also known to colonize brackish and freshwater sites. It is often referred to as a marsh-hen due to its hen-like appearance; however, the light-footed clapper rail has a long and stout bill and a relatively long neck. Optimal nesting habitat typically consists of monotypic stands of California cordgrass (*Spartina foliosa*) that the clapper rail uses to obscure its nest from view. The decline of the light-footed clapper rail has been directly attributed to the destruction of marsh habitat.

4.4.6.1. SURVEY RESULTS

The CDFW conducts annual census surveys for light-footed clapper rail along coastal wetlands from Mugu Lagoon in Ventura County, south to Tijuana Slough National Wildlife Refuge in the southwestern-most portion of San Diego County. According to the 2011 census report (Zembal et al. 2011), light-footed clapper rail was first detected in the San Dieguito River Valley in 2004. The San Dieguito River Valley survey area encompasses areas supporting suitable habitat from the mouth of the lagoon to approximately 1 mile east of El Camino Real. In 2012, 45 pairs and unpaired individual rails were detected in the San Dieguito River Valley, making this site the third largest subpopulation in California (Zembal and Hoffman 2012.). The distribution of light-footed clapper rails in 2012 is presented in Figure 10. This figure illustrates that the majority of the rails observed were distributed upstream (east) of the Project area.

The 45 pairs and unpaired individual rails detected in 2012 represent 8.7% of the statewide population of 520 paired and unpaired rails reported by Zembal and Hoffman in 2012. Table 4-8 summarizes the results of nine years of annual surveys reported by Zembal and Hoffman for the San Dieguito River and lagoon beginning in 2004 when the first observations of rails in the river and estuary were recorded. This table demonstrates the variability of the San Dieguito River population and provides a basis for post-Project comparisons.



El Camino Real Bridge Construction

Light-footed Clapper Rails Detected by Zembal and Hoffman 2012

Figure 10

11/20/2014 JN M:\Mdata\25104082\GIS\Maps\ClapperRailSightings.mxd

Table 4-8. Numbers of Light-footed Clapper Rails Detected in San Dieguito River and Lagoon 2004-2013 (Zembal and Hoffman 2013)

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of Rails Detected	6	12*	*31	*15	*21	*12	*28	*12	*45	37

*Indicates the detection of unpaired rails.

Light-footed clapper rail was detected aurally during 2012 least Bell's vireo focused surveys for the proposed SANDAG San Dieguito Lagoon W19 Wetland Mitigation Project (Appendix F). During these surveys, light-footed clapper rails were detected from three general locations: under the southern abutment of the bridge, and approximately 100 to 200 ft east and west of the bridge. These results indicate that individuals utilize habitat occurring east and west of the bridge.

All areas supporting coastal freshwater marsh in the BSA are considered occupied by light-footed clapper rail. In addition, all areas of disturbed southern willow scrub and disturbed and undisturbed mule-fat scrub are considered as foraging/refugia habitats utilized by the clapper rail. In coordination with the City, USFWS, and CDFW, it was determined that updated light-footed clapper rail surveys would not be required because this area is surveyed annually and the presence of this species within the BSA had already been determined. Light-footed clapper rail was also detected aurally east of the bridge in the BSA on April 17 and May 9, 2009, during focused surveys for the least Bell's vireo conducted by ICF (Appendix D).

In 2006, 31 to 36 light-footed clapper rail pairs, including 4 to 5 pairs east of the bridge, were detected during focused surveys conducted within the San Dieguito River (Tierra 2006). According to a habitat assessment for the light-footed clapper rail conducted in 2004 (Appendix J of the 2006 NES, Varanus 2004) a minimum of 5, and possibly as many as 8 pairs, of clapper rail and up to 10 or more territories were detected in the vicinity of the BSA during the 2004 habitat assessment. The area surveyed at that time included portions of the San Dieguito River approximately 1,000 ft east and west of the El Camino Real Bridge (Tierra 2006).

4.4.6.2. Avoidance and Minimization

Construction of the western and Central Alignment Alternatives would span three breeding seasons, and construction of the eastern and Roundabout Alignment Alternatives would span two breeding seasons. Construction activities for all alternatives would be restricted in the river corridor during the combined bird nesting season (February 1 to September 30), thereby avoiding the nesting season for light-footed clapper rail.

Construction activities alternatives associated with work within the river corridor have been presented in Section 1.2.3. Two options were presented with potential short-term impacts to light-footed clapper rail: 1) the berm(s) option; and, 2) the trestle(s) option. Both would have potential indirect impacts on the rail. A berm or series of berms would constrict the area of the river that currently serves as a wildlife corridor allowing movement for a number of species, including light-footed clapper rail, east and west of the bridge. The trestle option would entail driving approximately 700-800 temporary piles to construction a stable work surface. Twenty-inch diameter steel piles will be driven with either diesel-driven impact hammers or quieter hydraulic impact hammers resulting in noise levels within occupied clapper rail habitat greater than 60 dBA within approximately 4,000 ft of the pile driver using diesel-driven pile drivers and 1,200 ft using hydraulic pile drivers. Piles will be removed using vibratory pile extractors resulting in noise levels within occupied clapper rail habitat greater than 60 dBA within approximately 800 ft of the pile extractor. Details on noise associated with pile driving and extraction are presented in Appendix J. As the light-footed clapper rail is a permanent resident of regional marshes (non-migratory), avoidance of work during the breeding season does not ensure avoidance of indirect impacts, e.g., the presence of a berm or series of berms for 2 – 3 years may affect local movement of rails along the river corridor and noise and vibration from pile driving may affect the behavior of the rail.

In order to further avoid and minimize impacts to light-footed clapper rail the following general and specific measures will be implemented:

General Measures

- Staging and equipment storage areas, and equipment maintenance will be located outside of the river corridor;
- A qualified biologist will train construction crews (including utility personnel) to avoid unnecessary impacts to the biological resources by briefing them on resource protection measures. The project biologist must be familiar with the life history of light-footed clapper rail;
- Prior to the start of construction, a qualified project biologist will supervise installation of orange construction fencing or equivalent along the limits of disturbance within and surrounding sensitive habitats as shown on the approved construction plans. Temporary fencing will be removed after project completion.
- The project biologist will monitor all phases of construction to minimize impacts on sensitive species, check that wildlife is not entrapped, verify that the boundary fencing is maintained in good condition, and ensure that construction activities do not encroach into biologically sensitive areas beyond the approved limits of construction.

- A wildlife corridor will be maintained during all construction within the river corridor during non-breeding season. Should the berm option be exercised, the wildlife corridor will consist of a spanned low flow channel of the river, approximately 40 ft wide. Orange construction fencing will be installed parallel to the low flow channel to discourage wildlife from accessing the construction areas approved in the plans. The trestle option would provide for a wildlife corridor that maintains the current geometry of the river corridor with the exception of the rows of driven piles that will function similarly to the existing bridge support columns, i.e., will result in a series of passageways across the river.
- Construction lighting in upland areas will be the lowest illumination necessary, and directed away, or shielded from the river corridor.
- The project site will be kept as clean of debris as possible to avoid attracting predators of sensitive wildlife. All food-related trash items will be enclosed in sealed containers and regularly removed from the site.
- Pets of project personnel will not be allowed on the project site.
- Disposal or temporary placement of excess fill, brush, or other debris will not be allowed in Waters of the U.S. or within their banks.

Specific Measures

- No construction will occur within the river corridor during the clapper rail breeding season (February 1 – September 30).
- Noise from construction activities outside of the river corridor will not exceed 60 dBA (1-hour) at the river corridor (or ambient, whichever is greater) during the light-footed clapper rail breeding season. If the noise limit is exceeded, the noise will be reduced by using temporary noise measures such as plywood barriers, equipment mufflers, or sound blankets.
- Outside of the breeding season, construction in the river corridor will be limited to daylight hours. No temporary lighting will be installed for construction at night.
- Prior to beginning construction at the end of the clapper rail breeding season (October 1) all vegetation within the approved limits of disturbance will be removed to eliminate the potential for rails to seek vegetative cover. The project biologist will monitor vegetation removal activities to avoid impacts to rails during this process. Should any rails be detected in the limits of disturbance, vegetation removal activities will be halted temporarily while the project biologists flushes the rail(s) from the area to be cleared into existing emergent vegetation west of east of the bridge.

- A wildlife corridor will be maintained during all construction within the river corridor during non-breeding season to allow east/west movement by rails. For the berm option, the wildlife corridor will consist of a spanned low flow channel of the river, approximately 40 ft wide. Orange construction fencing will be installed parallel to the low flow channel to discourage clapper rails from accessing the construction areas approved in the plans. The trestle option would provide a series of openings across the width of the river.
- These measures have been developed in an effort to prevent clapper rails from being injured or killed by construction activities within the fenced construction footprint by removing vegetation that might provide cover; fencing to discourage access by the clapper rail; and monitoring to determine the effectiveness of these measures. Should earthen berms be employed for access across the San Dieguito River, a minimum of one 40-foot-wide corridor will be bridged to allow river flow to allow rails and other species to move east and west along the river corridor. Should the trestle option be employed, wildlife movement can occur between parallel rows of driven piles.
- The river corridor is defined as all water and wetland vegetation occurring between the banks of the river, similar to area delineated as being CDFW jurisdictional. Where those banks are steep and/or armored, such as the area immediately upstream of the existing bridge, this definition is more obvious. Where the banks are less steep and vegetation exists on the banks, this definition may be less obvious; however, once upland habitats or developed areas occur, these are considered outside of the corridor. Thus, the polo fields and golf course to the east of the bridge are not considered within the river corridor, nor are the Horse Park or fallow agricultural fields to the west of the bridge.
- Wetland regulations that require no-net-loss of wetlands would provide additional protection for this species. The proposed Project conforms to the conditions of coverage established by the MSCP for this species because proposed mitigation would result in no-net-loss of wetlands. This species is covered by the MSCP because 93% of its potential habitat would be preserved under this plan. Although covered by the MSCP, the federal MSCP permit does not authorize harm or lethal take for the species. Also, light-footed clapper rail is a fully protected species; therefore, “take” of this species cannot be authorized by the state.

4.4.6.3. PROJECT IMPACTS

Potential Project Impacts Common to All Alternatives

Construction Activities

All Project alternatives would require either berms or trestles for construction of the new bridge and demolition of the existing bridge. Both may result in indirect impacts to the clapper rail during the non-breeding season. Noise from construction and demolition of the berms, as well as construction and demolition, may affect the behavior of rails near the source of noise. In addition, the berms may limit local movement of clapper rails despite inclusion of a 40-foot-wide bridged low flow/wildlife corridor. Noise from pile driving may affect rail behavior.

Predicted noise levels from construction activities, proposed both during and outside of the clapper rail breeding season, have been presented in Chapter 1. A major source of construction noise, as well as vibration, is the driving of temporary piles. Noise modeling indicates that noise from pile driving may exceed 60 dBA at a distance of more than 4,000 ft from the source even with employment of state-of-the-art attenuation measures. It is not known how many individual clapper rails use the portion of the river within 4,000-ft of proposed pile driving locations (which vary with bridge alternatives) as individual rails move about within the river while foraging; however, based on the 2012 distribution of clapper rails in the Project area, noise from pile driving would exceed 60 dBA at the locations of 17 pairs and 17 individual rails under diesel pile driving conditions (Figure 11) and nine individual rails and six paired rails under hydraulic pile driving conditions (Figure 12).

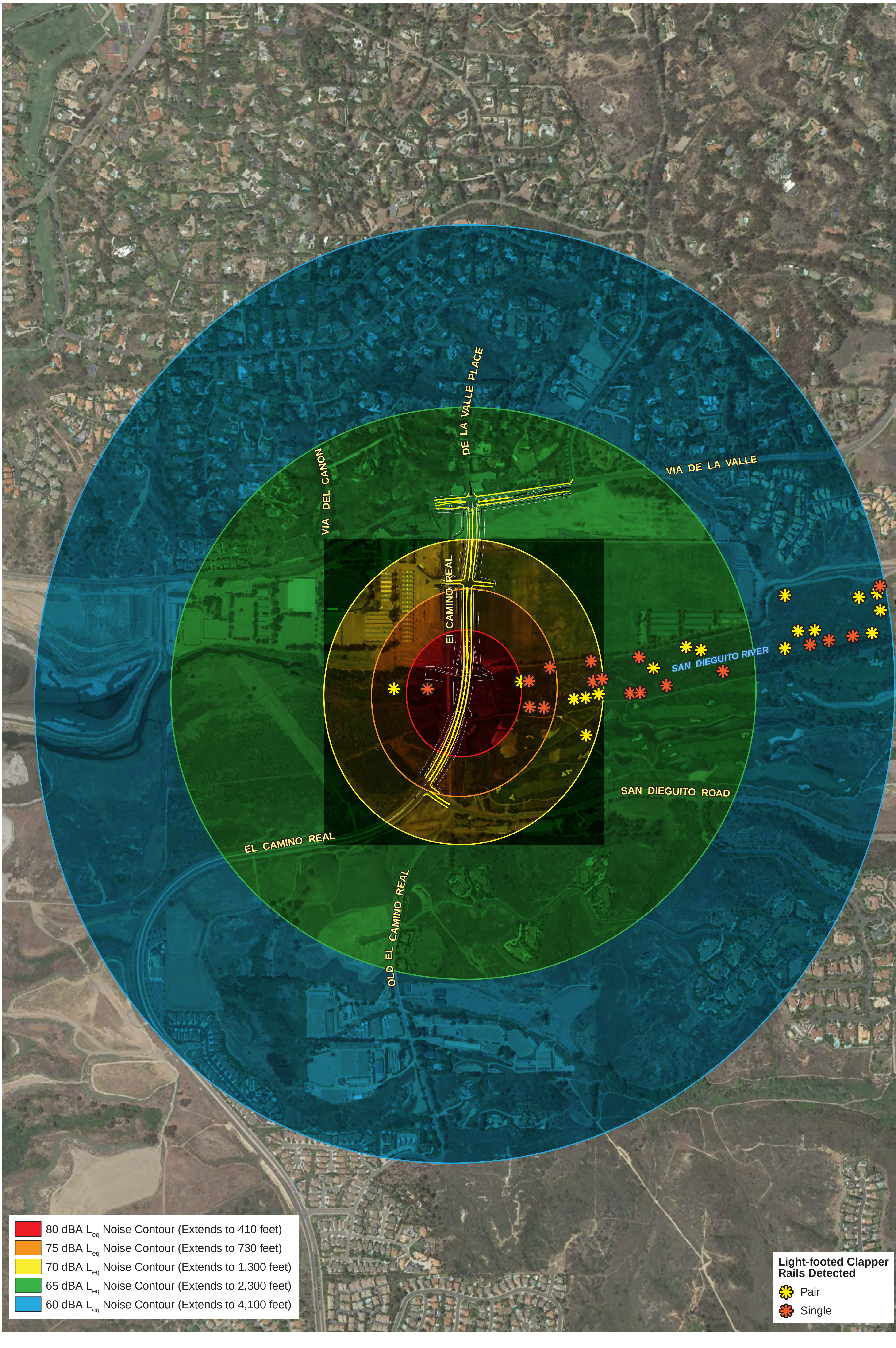
It is also cannot be known how individual rails that might occur within this portion of the river during pile driving activities might react to noise and vibration without actually subjecting them to such noise and vibration. Extensive research indicates that this is the only bridge replacement project proposed or constructed that would traverse a population of light-footed clapper rails.

It is possible that rails subjected to noise and vibration will move away from the source, presumably farther east or west of the bridge. If the occupied habitat is at or near carrying capacity, i.e., supports the maximum density of rails possible, it is possible that the individuals seeking to escape the noise/vibration will encounter other individual rails that may contest their presence. It is further possible individual rails would be displaced and would have to seek unoccupied habitat, if any, or displace yet another individual or individuals. Any potential displacement may temporarily disrupt foraging and, depending on the extent of displacement, may temporarily disrupt breeding of some pairs. It is not anticipated that displacement would result in injury or death. However, should the rail or rails seek to escape noise or vibration by moving into upland habitats, the potential for death or injury from terrestrial and avian predators could increase.

It is also possible that the rails will tolerate the noise or vibration. With no data available from similar projects, the effects of potential displacement of an unknown number of individuals on other dynamics of the clapper rail population in the project area, such as the genetic diversity or reproductive productivity of the population, can only be conjecture. Many other factors may affect genetic diversity and productivity. For example, in the hypothetical case of the population being at carrying capacity, a future population decline may be predicted as competition for resources increases. Population decline may occur for other reasons, such as continued spread of invasive tamarisk that supports raccoons and other predators of the rail. This example illustrates the difficulty in determining cause-and-effect of shifts in a population of such a secretive species. Should the project proceed and a detectable decline occurs in the clapper rail population, there can be no certainty of its cause. As stated by Zembal and Hoffman (2012) this particular population of clapper rails has fluctuated widely in terms of numbers since it was reported in 2004. The reasons for these fluctuations are not known, but could be attributable to the factors discussed above. The City proposes to work with the Wildlife Agencies to implement any and all feasible measures to avoid, minimize and mitigate potential Project impacts to light-footed clapper rail.

Western Alignment Alternative

Implementation of the avoidance and minimization measures would avoid direct impacts to light-footed clapper rail. Project activities would be restricted in the river corridor each year during the breeding season (three breeding seasons for the Western Alignment Alternative). All coastal freshwater marsh occurring in association with the San Dieguito River is considered suitable foraging and nesting habitat for the clapper rail and is considered occupied by light-footed clapper rail (Figure 6a). All riparian habitats occurring adjacent to the San Dieguito River can be utilized by light-footed clapper rail for foraging and when seeking refuge from high flows. Thus, indirect impacts to this species are anticipated in association with the Western Alignment Alternative alignment due to impacts within the river corridor to 0.82 ac of freshwater marsh, 0.3 ac of disturbed southern willow scrub, 0.06 ac of disturbed mule-fat scrub, and 0.19 ac of tamarisk scrub.

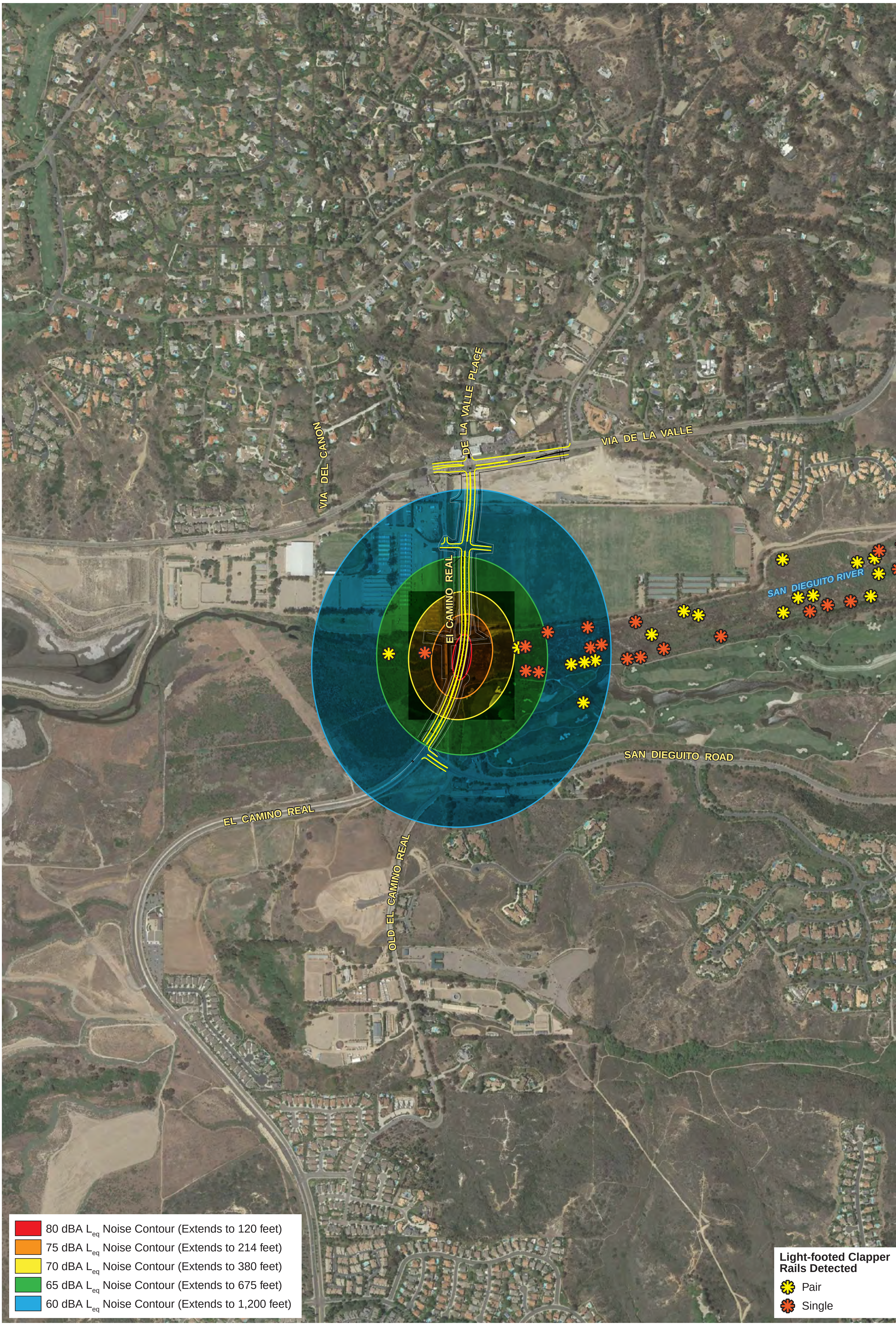


EL CAMINO REAL BRIDGE REPLACEMENT

Bridge Construction Noise Contours (with Diesel Pile Driving) and Distribution of Light-Footed Clapper Rails 2012

04/03/15 JN 130642-18917 MAS

Figure 11



EL CAMINO REAL BRIDGE REPLACEMENT

Bridge Construction Noise Contours (with Hydraulic Pile Driving) and Distribution of Light-Footed Clapper Rails 2012

04/03/15 JN 130642-18917 MAS

Figure 12

Central Alignment Alternative

Implementation of the avoidance and minimization measures would avoid direct impacts to light-footed clapper rail. Project activities would be restricted in the river corridor each year during the breeding season (three breeding seasons for the Central Alignment Alternative). All coastal freshwater marsh occurring in association with the San Dieguito River is considered suitable foraging and nesting habitat for the clapper rail and is considered occupied by light-footed clapper rail (Figure 6b). All riparian habitats occurring adjacent to the San Dieguito River can be utilized by light-footed clapper rail for foraging and when seeking refuge from high flows. Thus, indirect impacts to light-footed clapper rail are anticipated in association with the Central Alignment Alternative alignment due to impacts within the river corridor to 1.04 ac of coastal freshwater marsh, 0.06 ac of southern willow scrub, 0.05 ac of mule-fat scrub, and 0.1 ac of disturbed mule-fat scrub.

Eastern Alignment Alternative

Implementation of the avoidance and minimization measures would avoid direct impacts to light-footed clapper rail. Project activities would be restricted in the river corridor each year during the breeding season (two breeding seasons for the Eastern Alignment Alternative). All coastal freshwater marsh occurring in association with the San Dieguito River is considered suitable foraging and nesting habitat for the clapper rail and is considered occupied by light-footed clapper rail (Figure 6c). All riparian habitats occurring adjacent to the San Dieguito River can be utilized by light-footed clapper rail for foraging and when seeking refuge from high flows. Thus, indirect impacts to light-footed clapper rail are anticipated in association with the Eastern Alignment Alternative alignment due to impacts within the river corridor to 1.5761 ac of coastal freshwater marsh, 0.12 ac of disturbed southern willow scrub, 0.29 ac of mule-fat scrub, and 0.25 ac of disturbed mule-fat scrub.

Roundabout Alignment Alternative

Implementation of the avoidance and minimization measures would avoid direct impacts to light-footed clapper rail. Project activities would be restricted in the river corridor each year during the breeding season (two breeding seasons for the Roundabout Alignment Alternative). All coastal freshwater marsh occurring in association with the San Dieguito River is considered suitable foraging and nesting habitat for the light-footed clapper rail and is considered occupied by the light-footed clapper rail (Figure 6d). All riparian habitats occurring adjacent to the San Dieguito River can be utilized by light-footed clapper rail for foraging and when seeking refuge from high flows. Thus, indirect impacts to light-footed clapper rail are anticipated in association with the Roundabout Alignment Alternative alignment due to impacts within the river corridor to 1.654 ac of coastal freshwater marsh, 0.31 ac of southern willow scrub, 0.29 ac of mule-fat scrub, and 0.25 ac of disturbed mule-fat scrub.

JPA Mitigation Area

No direct impacts to light-footed clapper rail are anticipated from construction of the JPA mitigation area. All Project activities would be restricted during the breeding season. However, all coastal freshwater marsh occurring in association with the San Dieguito River is considered suitable foraging and nesting habitat for the light-footed clapper rail (Figure 6e) is considered occupied by the light-footed clapper rail. All riparian habitats occurring adjacent to the San Dieguito River can be utilized by light-footed clapper rail for foraging and when seeking refuge from high flows. Impacts to light-footed clapper rail occupied habitat would not occur because coastal freshwater marsh and riparian habitats associated with the San Dieguito River in the JPA mitigation area would be enhanced through implementation of the proposed wetland creation/enhancement plan and, thus, is not considered impacted.

4.4.6.4. Compensatory Mitigation

No direct impacts to light-footed clapper rail are anticipated. Formal consultation with the USFWS will be required pursuant to Section 7 of the FESA in order to develop final avoidance and mitigation measures for the federally and state endangered and state fully protected light-footed clapper rail. In addition, the project must comply with CDFW requirements pursuant to Section 4700 of the CDFW Code for Fully Protected Species. It must be demonstrated that the Project will not result in take of this species. No direct impacts to this species are anticipated from any of the four alternatives or the JPA mitigation area. The avoidance and minimization measures stated in Section 4.4.6.2 are intended to ensure avoidance of indirect impacts to light-footed clapper rail.

Habitat-based mitigation would be provided for the loss of suitable/occupied light-footed clapper rail habitat. In the Project area, potential light-footed clapper rail habitat consists of coastal freshwater marsh and riparian habitats within the San Dieguito River. To offset anticipated Project impacts to this habitat, coastal freshwater marsh would be created or enhanced at the JPA mitigation site, within the San Dieguito River watershed, at a 4:1 ratio. Thus, no net loss of clapper rail occupied wetlands has been achieved for all but the Roundabout Alternative. Additional mitigation opportunities at the W19 mitigation site are being negotiated with SANDAG. Mitigation 4:1 ratios are based on the sensitivity of the light-footed clapper rail, as recommended by CDFW and USFWS in multi-agency coordination meetings held in 2005. Impacts to riparian habitat would also require habitat-based mitigation (Section 4.1).

An earthen berm will be created within the JPA mitigation area in order to protect the created marsh habitats from sediment deposition. The berm will be open on the western end and an armored weir would be constructed within the berm, approximately 7 ft lower than the top of the berm. Light-footed clapper rail would be able to enter the mitigation area from the river through the western end of the berm or by walking over the berm and weir. Light-footed clapper rail are known to utilize upland areas such as levees banks (similar to the weir) in order to seek refuge from high flows or while foraging.

The JPA mitigation area is situated west of the road alignments proposed for all four alternatives, and adjacent to the San Dieguito River outside of the actual river channel. Unlike the currently occupied coastal freshwater marsh, the mitigation area would be protected by the earthen berm from strong flows in the river channel that could result in damage to the vegetation. Flow velocities through the mitigation area will be low and should have limited effects on scour, even during larger storm events (Rick Engineering 2012).

The transmission lines that that occur within the utility corridor to the west of the JPA mitigation site have been observed to provide perches for red-tailed hawk and other raptors that prey on clapper rail chicks. However, removal of this transmission line and the buried utilities beneath the line is infeasible. Numerous potential perches, including tall *Eucalyptus* trees, telephone poles, and structures, occur along the approximately 1-mile stretch of the river from El Camino Real upstream to Morgan Run Golf Course, yet the clapper rail population appears to be more at risk from terrestrial predators, e.g., raccoons, than from aerial predators (see Zembal and Hoffman 2012). In the Project area, areas of dense vegetation with more open areas for foraging appear to be important characteristics of this habitat for clapper rails. The restoration plan proposes to create a similar mosaic at the mitigation site with sufficient cover to provide refuge from most aerial predators.

4.4.6.5. Cumulative Effects

Although the proposed Project would result in temporary loss of suitable habitat for the light-footed clapper rail, a species covered by the MSCP, implementation of the proposed wetland creation/enhancement plan within the JPA mitigation area would create suitable nesting and foraging habitat for the light-footed clapper rail. The Project is not expected to result in significant cumulative impacts.

River Hydraulics and Light-footed Clapper Rail

The following discussion is provided in response to the 2006 Wildlife Agencies letter regarding river hydraulics and the potential effect of the project on the light-footed clapper rail.

The freshwater marsh habitat that occurs within the banks of the San Dieguito River in the Project area supports the third largest population of light-footed clapper rail in southern California. It has been postulated that there are certain physical and biological characteristics of the river in the Project area that have resulted in development of freshwater marsh habitat that is particularly attractive to the rail. Physical characteristics may include, but are not limited to, the hydraulics of the river in this area, specifically water surface levels (WSLs) and velocities during low flow periods and during periods of higher flows associated with storm events. Biological factors may include, but are not limited to, the structure of the freshwater marsh habitat. That structure may be described as dense, tall vegetation that provides cover for this secretive species combined with more open areas where the rails may forage. Due to the sensitivity of the clapper rail, it is critical that these characteristics be maintained during and after construction of the proposed bridge.

In the project area during periods of low river flow, e.g., non-storm events, water within the river flows slowly along a relatively flat gradient. This slow-moving shallow water provides the physical conditions optimal for growth of freshwater marsh plant species. The dominant species in the area of the bridge – *Schoenoplectus californicus* (California bulrush) and *Typha domingensis* (southern cattail) – typically grow in several inches to 2-3 ft of water and typically do not grow in water deeper than 3 ft. Low flows in the river in the Project area vary, but are generally within this range (C. Nordby, personal observation.). The low flow condition, however variable, provides the physical conditions that support the habitat favored by the clapper rail. Because the low flow varies, there is no hydraulic model for these flows.

Several studies have been conducted of the hydraulics of the river in the Project area, most recently in a May 2013 study of river hydraulics during bridge construction prepared by Rick Engineering. This report and a previous report prepared in April 2012 by Rick Engineering was prepared in response to comments by the Wildlife Agencies regarding the proposed freshwater marsh mitigation area, formerly the proposed brackish marsh mitigation site. This habitat change reflects the shift in species composition of the marsh habitat within the river since the original mitigation plan was proposed in the 2006 NES and Draft EIR.

River Hydraulics During Bridge Construction

Two construction alternatives were modeled to analyze the temporary impacts of each to the San Dieguito River water surface elevation level (WSEL) and the velocities within the Project study area.

<u>Alternatives Modeled</u>

Temporary Berm Construction Alternative

The temporary berm models are based on a temporary construction berm with the following characteristics:

- Construction of a temporary berm extending approximately 166 ft along the San Dieguito River extending 30 ft upstream and 30 ft downstream of the edge of the proposed bridge deck tied in with the existing ground level of the river bed within 15 ft upstream and downstream of the berm surface.
- The width of the berm will vary based on the height of the fill placed and the left and right bank of San Dieguito River.
- Three berm height options were modeled including 5, 6, and 8 ft high fill relative to the lowest elevation of the river bottom with top elevations of 11, 12, and 14 ft respectively. Each berm height alternative was modeled with two different options/openings for the low flow to determine the hydraulic impact of the berm to the San Dieguito River: 1) three trapezoidal openings with a 40-ft top width and 3:1 side slopes with opening depths of 2, 3 and 5 ft; and 2) a combination of two trapezoidal openings with opening depths of 3 and 5 ft, and culvert pipe openings of three 2 in and three 4in plastic or Reinforced Concrete Pipes (RCPs), respectively.
- It is assumed that each of these berm openings will be constructed by placing a short trestle of 3 ft total height section across the span and that no obstructions below each span are placed.

For each of the above temporary berm construction alternative at least one of the openings would be located over the existing low flow channel within the San Dieguito River and all of them would be at the lowest elevation of the river.

Trestle Construction Alternative

The temporary construction trestle models incorporate a temporary construction trestle with the following characteristics:

- Construction of a temporary trestle extending the full width of the river, approximately 136 ft, extending 30 ft upstream and 30 ft downstream of the edge of the proposed bridge deck.
- Trestle piles grouped in bents constructed using groupings of 18 in diameter piers spaced at 4 ft on center (within each bent) with approximately 6 to 7 piles at each bent. The bents are anticipated to be spaced approximately at 25 ft on center with trestle spans between each bent. The orientation of the bents would be parallel to the bridge piers, and therefore parallel to the river flow.
- Side trestles are needed at each bridge pier location. The model assumed three bents at 25 ft spacing with an overall dimension of the width of the structure multiplied by 50 ft. The trestle height assumed 2 ft.

- Two trestle height options were utilized with a 3 and 5 ft elevation from the lowest elevation of the river bottom with a trestle bottom elevations of 9 and 11 ft respectively.

Hydrologic Analyses

The hydrologic analyses included the tributary watersheds to the San Dieguito River from Lake Hodges upstream to downstream of the existing El Camino Real Bridge were performed using the methodology outlined in the April 1984, City of San Diego Drainage Design Manual for the 2-year and smaller storm events. The analyzed watershed encompasses approximately 22,336 acres of land (34.9 square-miles), therefore the SCS Method was utilized. The U.S. Army Corps of Engineers ft - HEC-1 computer program was used for the 1-, 1.3-, and 2-year storm events.

Hydraulic Analyses

As a base for the hydraulic models created for the different temporary construction alternatives the following hydraulic studies were used:

- "Hydraulic Study for El Camino Real Bridge Project on the San Dieguito River," prepared by Rick Engineering Company, dated April 12, 2012.

The 2012 hydraulic model was further developed to analyze the temporary construction alternatives. To analyze the worst case obstruction of flow in the river during construction, the hydraulic models for the proposed condition include the piers from the existing and the proposed Bridge, e.g., constructing the proposed bridge while the existing bridge remains in place.

The U.S. Army Corps of Engineers HEC-RAS 4.1 was used to perform the hydraulic analysis for the different construction alternatives.

The Eastern Alignment Alternative (and therefore also the Roundabout Alternative) was selected as the focus of the construction hydraulic modeling. For these alternatives, the bridge construction would occur at the most upstream (most eastern) location. Potential impacts on water surface elevations would therefore extend the farthest upstream (to the east) in the San Dieguito River, representing the most conservative (worst case) hydraulic impacts for environmental analysis.

The hydraulic modeling conducted for construction and post-construction of the bridge is based on the conceptual design of the bridge and conceptual construction methods. Once the final design is completed and construction methodology determined, hydraulic modeling will be refined.

Hydrologic Results

Table 4-9 presents a summary of the 1.0-, 1.3- and 2-year peak flow rates information at varying tributary confluence locations.

Table 4-9. Peak Flow Rates within the San Dieguito River

Location Id	Total Tributary Area (sqmi)	Peak Flow Rates (cfs) 1.0-year	Peak Flow Rates (cfs) 1.3-year	Peak Flow Rates (cfs) 2-year
A	3.5	173	647	1,306
B	20.4	425	1,397	2,707
C	34.5	427	1,629	3,462
D	34.9	426	1,624	3,450

The peak flow rates for the 1-, 1.3-, and 2-year storm events from Table 4-9 were used in the hydraulic models.

Hydraulic Model Methodology

Input parameters utilized for the portion of the San Dieguito River subject to this hydraulic study for the temporary construction phase of the El Camino Real Bridge are presented below. Two construction alternatives were modeled to analyze the temporary impacts to the San Dieguito River water surface elevation and the velocities within the area of study for this project. For each alternative, multiple hydraulic models were created.

Temporary Berm Construction

Five options were created for modeling of the temporary construction berm alternative:

- Option 1: 6- ft high fill berm with two 3-ft deep trapezoidal berm openings with 3:1 side slopes, and three 24 in culverts (plastic or RCP) with a 3 ft total height trestle section across the berm openings span,
- Option 2: 8- ft high fill berm with two 5-ft deep trapezoidal berm openings with 3:1 side slopes and three 4i n culverts with a 3 ft total height trestle section across the berm openings span,
- Option 3: 5- ft high fill berm with three 2-ft deep trapezoidal berm openings with 3:1 side slopes with a 3 ft total height trestle section across the berm openings span,
- Option 4: 6- ft high fill berm with three 3-ft deep trapezoidal berm openings with 3:1 side slopes with a 3 ft total height trestle section across the berm openings span, and
- Option 5: 8- ft high fill berm with three 5-ft deep trapezoidal berm openings with 3:1 side slopes with a 3 t total height trestle section across the berm openings span.

The top of each berm opening was assumed to be 40 ft wide with a total open area of 68 sq ft, 93 sq ft, and 125 sq ft for the 2 ft, 3 ft and 5 ft berm respectively. At least one of the openings was located over the existing low flow channel within the San Dieguito River.

Temporary Trestle Construction

Two options were created for the temporary construction trestle alternative:

- Option 1: Trestle bottom elevation 3 ft above lowest elevation within the channel cross-section, and
- Option 2: Trestle bottom elevation 5 ft above lowest elevation within the channel cross-section.

For each trestle option, a trestle was assumed to be set on the top of the piles and connected to them. The total height of the trestle construction was assumed to be 2 ft.

Hydraulic models were prepared for the existing and temporary construction alternatives condition, analyzing 100-, 50-, 10-year utilizing FEMA flow rates of 42,800, 32,500 and 5,900 cfs, respectively, and 2-, 1.3-, and 1.0-year storm events utilizing flow rates from the hydrologic study with flow rates of 3,450, 1,624 and 426 cfs, respectively.

Another consideration for the temporary construction alternatives is comparing their capacity to convey the daily low-flows in the San Dieguito River. Therefore, the average daily flow-rates were also identified.

Average Daily Flow-Rate

The gage stations along the San Dieguito River downstream of Lake Hodges are inactive and there are no known sufficient dry weather stream flow data available for this river channel. Average daily stream flow data were available only for the San Dieguito River at North Del Mar gage station. The average daily flow data at this gage is 3.7 cfs. A conservative estimate that doubled the available average daily flow data for a flow rate of 7.4 cfs was used in the model.

Hydraulic Model Results

Eastern Alignment

Temporary Berm Construction

The temporary berm construction alternative analyzed 5 different options. The results from the hydraulic analyses for Option 1, 2 and 3 showed that the proposed low flow trapezoidal channels with the temporary culverts were not sufficient to convey even the 1.0-year storm event. Therefore, these options were eliminated from further consideration. A summary of the hydraulic impact of Option 4 and Option 5 are presented below in Tables 4-10 and 4-11.

Temporary Trestle Construction

A summary of the hydraulic impact of Option 1 and Option 2 are presented below in Tables 4-12 and 4-13.

Table 4-10. Hydraulic Impact of Temporary Construction Berm, Option 4

6ft Berm Option with three 3 foot high berm openings - Option 4						
Berm Deck High Chord EL	12					
Berm Deck Low Chord EL	9					
River Flowline Elevation (ft)	6.0	6.0	6.0	6.0	6.0	6.0
Opening Area (sq. ft.)[1]	279					
Storm Event	1.0 in (1.0-Year)	1.5 in (1.3-Year)	2 in (2-Year)	10-Year	50-Year	100-Year
Q (cfs)	426	1,624	3,450	5,900	32,500	42,800
Existing Condition[2]						
WSEL (ft)	7.8	10.3	11.9	13.3	20.2	21.9
Flow Velocity (fps)	1.6	1.7	2.3	2.9	5.3	5.7
6ft Berm Option with three 3 foot high berm openings - Option 4						
WSEL (ft)	7.8	11.3	13.6	14.7	21.4	23.3
Flow Velocity (fps)	2.9	1.7	2.1	2.9	7.6	8.7
WSEL Increase @ sta 2.649 (ft)	0.0	1.0	1.7	1.4	1.2	1.4
Maximum WSEL Increase (ft)[4]	0.0	1.9	2.0	1.8	2.3	2.7

Notes:
[1] - Opening area of the proposed three berm openings at the bottom of the San Dieguito River
[2] - Existing Condition data based on interpolated cross-section 2.649
[3] - Temporary 3ft berm option with 3-berm openings based on cross-section 2.649
[4] - Maximum WSEL elevation impact throughout all cross-sections.

Table 4-11. Hydraulic Impact of Temporary Construction Berm, Option 5

8ft Berm Option with three 5 foot high berm openings - Option 5						
Berm Deck High Chord EL	14					
Berm Deck Low Chord EL	11					
River Flowline Elevation (ft)	6.0	6.0	6.0	6.0	6.0	6.0
Opening Area (sq. ft.)[1]	375					
Storm Event	1.0 in (1.0-Year)	1.5i n (1.3-Year)	2 in (2-Year)	10-Year	50-Year	100-Year
Q (cfs)	426	1,624	3,450	5,900	32,500	42,800
Existing Condition[2]						
WSEL (ft)	7.8	10.3	11.9	13.3	20.2	21.9
Flow Velocity (fps)	1.6	1.7	2.3	2.9	5.3	5.7
8ft Berm Option with three 5 foot high berm openings - Option 5						
WSEL (ft)	8.4	10.4	14.4	16.2	22.9	24.7
Flow Velocity (fps)	3.5	5.3	2.4	2.9	7.6	8.7
WSEL Increase @ sta 2.649 (ft)	0.6	0.1	2.5	2.9	2.7	2.8
Maximum WSEL Increase (ft)[4]	0.6	0.7	3.3	3.4	3.8	4.1

Notes:
[1] - Opening area of the proposed three berm openings at the bottom of the San Dieguito River
[2] - Existing Condition data based on interpolated cross-section 2.649
[3] - Temporary 5ft berm option with 3-berm openings based on cross-section 2.649
[4] - Maximum WSEL elevation impact throughout all cross-sections.

Table 4-12: Hydraulic Impact of Temporary Trestle Construction, Option 1

Trestle Option with 3 foot high opening - Option 1						
Trestle Deck High Chord EL	11					
Trestle Deck Low Chord EL	9					
River Flowline Elevation (ft)	6.0	6.0	6.0	6.0	6.0	6.0
Opening Area (sq. ft.)[1]	768					
Storm Event	1.0 in (1.0-Year)	1.5 in (1.3-Year)	2 in (2-Year)	10-Year	50-Year	100-Year
Q (cfs)	426	1,624	3,450	5,900	32,500	42,800
Existing Condition[2]						
WSEL (ft)	7.8	10.3	11.9	13.3	20.2	21.9
Flow Velocity (fps)	1.6	1.7	2.3	2.9	5.3	5.7
Trestle Option with 3 ft height piles - Option 1						
WSEL (ft)	7.6	10.1	12.1	13.4	20.3	22.2
Flow Velocity (fps)	0.9	1.4	1.9	2.7	7.2	8.3
WSEL Increase @ sta 2.649(ft)	-0.2	-0.2	0.2	0.1	0.1	0.3
Maximum WSEL Increase (ft)[4]	0.0	0.0	0.4	0.3	1.1	1.5

Notes:
[1] - Opening area between the proposed trestle piles within the San Dieguito River @ cross-section 2.649
[2] - Existing Condition data based on interpolated cross-section 2.649
[3] - Temporary trestle construction option with 3 ft pile height based on cross-section 2.649
[4] - Maximum WSEL elevation impact throughout all cross-sections.

Table 4-13. Hydraulic Impact of Temporary Trestle Construction, Option 2

Trestle Option with 5 foot high opening - Option 2						
Trestle Deck High Chord EL	13					
Trestle Deck Low Chord EL	11					
River Flowline Elevation (ft)	6.0	6.0	6.0	6.0	6.0	6.0
Opening Area (sq. ft.)[1]	1,288					
Storm Event	1.0 in (1.0-Year)	1.5 in (1.3-Year)	2 in (2-Year)	10-Year	50-Year	100-Year
Q (cfs)	426	1,624	3,450	5,900	32,500	42,800
Existing Condition[2]						
WSEL (ft)	7.8	10.3	11.9	13.3	20.2	21.9
Flow Velocity (fps)	2.0	1.9	2.6	3.2	2.2	2.1
Trestle Option with 5 ft high piles - Option 2						
WSEL (ft)	7.6	9.9	11.6	13.6	20.8	22.7
Flow Velocity (fps)	0.9	1.4	2.1	2.6	7.0	8.1
WSEL Increase @ sta 2.649 (ft)	-0.2	-0.4	-0.3	0.3	0.6	0.8
Maximum WSEL Increase (ft)[4]	0.0	0.0	0.0	0.6	1.5	1.9

Notes:
[1] - Opening area between the proposed trestle piles within the San Dieguito River @ cross-section 2.649
[2] - Existing Condition data based on interpolated cross-section 2.649
[3] - Temporary trestle construction option with 5 ft pile height based on cross-section 2.649
[4] - Maximum WSEL elevation impact throughout all cross-sections.

Hydraulic Impacts Summary

Temporary Construction Berm Alternative

Option 4:

- **Low Flow Conveyance:** Option 4 safely conveys a 1-in (1.15-year) storm event with 1.2ft ft freeboard to top of berm.
- **Impact to WSEL**: There will be an increase in WSEL at cross-section 2.649 as a result of this option for all storm events except for the 1.0-year storm event. The WSEL increase during 100-year event at cross-section 2.649 (cross section nearest to proposed bridge) is 1.4 ft. The maximum increase in the WSEL during 100-year throughout the river reach is 2.7 ft. This is due to the obstruction of the berm deck, anticipated fill in the river and decreasing the conveyance of the river in the area of disturbance. However, given the sediment transport characteristics of the river, the berm could be constructed with acceptable riverbed sand to allow washout during larger storm events which would lessen the increase to water surface elevations during construction.
- **Impact to velocity:** There will be an increase in the 1.0-, 50-, and 100-year storm events. However, all storm events equal or less than the 10-year, have velocities that are primarily still non-erosive.

Option 5:

- **Low Flow Conveyance**: Option 5 safely conveys a 1-in (1.15-year) and 1.5-in (1.3-year) storm event with 2.6 ft and 0.6 ft freeboard to the bottom of berm deck, respectively.
- **Impact to WSEL**: There will be an increase in WSEL at cross-section 2.649 as a result of this option for all storm events except for the 1.0-, and 1.3-year storm event. The WSEL increase during 100-year event at cross-section 2.649 is 2.8 ft. The maximum increase in the WSEL during 100-year throughout the river reach is 4.1 ft. This is due to the obstruction of the berm deck, anticipated fill in the river and decreasing the conveyance of the river in the area of disturbance. However, given the sediment transport characteristics of the river, the berm could be constructed with acceptable riverbed sand to allow washout during larger storm events which would lessen the increase to water surface elevations during construction.
- **Impact to velocity:** There will be an increase in the 1.0-, 1.3-, 50-, and 100-year storm events. However, all storm events equal or less than the 10-year, have velocities that are primarily still non-erosive, although the increase is larger than the alternative berm option (#4).

Temporary Trestle Construction

Option 1:

- **Low Flow Conveyance:** Option 1 safely conveys a 1-in (1.0-year) storm event with 1.4f t freeboard to bottom of the trestle deck, and conveys a 1.5-in (1.3-year) storm event with 0.7 ft freeboard to top of the trestle deck.
- **Impact to WSEL:** There is no increase in the WSEL at cross-section 2.649 as a result of this option for the 1.0- year or 1.3-year storm event. There will be an increase throughout the river reach for the 2-, 10-, 50-, and 100-year storm event. The maximum increase in the WSEL during 100-year storm event throughout the river reach is 1.5 ft. This is due to the obstruction of the trestle construction and the decrease of the conveyance due to the piles that support the trestle deck.
- **Impact to velocity:** There will only be an increase in the 50-, and 100-year storm event. Furthermore, all storm events equal or less than the 10-year, have velocities that are non-erosive.

Option 2:

- **Low Flow Conveyance:** This option safely conveys the 1-in (1.0-year) and 1.5-in (1.3-year) storm event with 3.4 ft and 1.1 ft freeboard respectively to bottom of the trestle deck. The available conveyance is between 1.3-year (1. in) and 2-year (2.in) storm event.
- **Impact to WSEL:** There is no increase in the WSEL at cross-section 2.649 as a result of this option for the 1.0-, 1.3-, and 2.0-year storm events. There will be an increase throughout the river reach for the 10-, 50-, and 100-year storm event. The maximum increase in the WSEL during 100-year storm event throughout the river reach is 1.9 ft. This is due to the obstruction of the trestle construction and the decrease of the conveyance due to the piles that support the trestle deck.
- **Impact to velocity:** There will only be an increase in the 50-, and 100-year storm event. Furthermore, all storm events equal or less than the 10-year, have velocities that are non-erosive.

Overall, the conclusion for the two alternatives with the two options for each temporary construction method hydraulic models is that they each have capacity to convey the smallest 1.0-year storm event analyzed with a peak flow rate of 462 cfs. However, it is not anticipated that the daily low flows within San Dieguito River would surpass the lowest capacity of the proposed temporary construction berm alternative. Several alternatives provide more allowable conveyance, which on its own would be preferred, however, each has offsetting benefits when comparing velocities and water surface elevations (WSEs).

The study reach of San Dieguito River is a sand bed river and based on the sediment samples taken from the river for the "Hydraulic and Sediment Modeling of the San Dieguito River for Wetland Creation at the JPA/Boudreau Site," prepared by Chang Consultants, dated November 2005, the bed material consist of sand with small amounts of fines (silt and clay) and gravel. The material used to construct the temporary berm will be similar to the local material of the San Dieguito River in the area of disturbance.

It is important to note that while the hydraulic results for the temporary construction berm alternative are showing a maximum increase within the San Dieguito River upstream of the proposed El Camino Real Bridge higher than 1- ft during larger storm events, the berm could be designed to washout similar to the riverbed characteristics reflected in previous sediment transport analyses.

River Hydraulics After Bridge Construction

The revised 2012 hydraulics report analyzed the San Dieguito River under existing conditions with the existing El Camino Real bridge and compares those results with analysis of the river with construction of the Eastern Alignment Alternative. The Eastern Alignment Alternative includes construction of the new bridge upstream of the existing bridge, creating the freshwater marsh mitigation area just downstream of the existing bridge (including lowering of the overbank area immediately adjacent to the freshwater marsh mitigation site), widening of the roadway of Via De La Valle from El Camino Real to El Camino Real North, and removing the existing bridge. The analysis used the U. S. Army Corps of Engineers HEC-River Analysis System (HEC-RAS). The HEC-RAS analysis modeled the 10-, 50- and 100-year flood events.

As stated previously, there is no model for the low flow condition. Thus, the 10-year flood event must serve as a surrogate when analysis the potential impact of the new bridge on river hydraulics and its relationship to the clapper rail. During the 10-year flood event, WSEs in river with the new bridge in the Eastern Alignment would be slightly less or equal to WSEs under existing conditions. Velocities would also be very similar (Table 4-14).

Table 4-14. Hydraulic Conditions Modeling Results for 10-year Flood

Cross Section #	Existing Water Surface Elevation (ft above MSL)	Proposed Project Water Surface Elevation (ft above MSL)	Existing Channel Velocity ft per second (fps)	Proposed Project Channel Velocity ft per second (fps)
2.844	13.8	13.5	2.7	2.9
2.782	13.7	13.3	2.1	2.2
2.732	13.5	13.1	2.6	2.7
2,675	13.3	12.8	2.9	3.3
2.649	13.2*	12.7	3.0*	2.8

Table 4-14, continued

Cross Section #	Existing Water Surface Elevation (ft above MSL)	Proposed Project Water Surface Elevation (ft above MSL)	Existing Channel Velocity ft per second (fps)	Proposed Project Channel Velocity ft per second (fps)
2.637 Eastern Alignment Bridge	13.1*	12.7*	3.0*	3.0*
2.625	13.0*	12.6	3.0*	3.1
2.623	13.0	12.5*	3.0	3.3*
2.614	13.0	12.5	3.0	3.5
2.6115 Existing Bridge	13.0*	12.5*	3.0*	3.6*
2.609	13.0	12.5	3.0	3.6
2.59	12.8	12.4	3.5	3.3
2.524	12.5	12.3	2.8	2.1
2.439	12.2	12.0	2.8	2.6
2.341	11.8	11.7	3.8	2.7
2.231	11.5	11.5	2.2	2.2
2.155	11.2	11.2	2.6	2.6
2.06	10.8	10.8	3.6	3.6
1.979	10.5	10.5	3.7	3.7

Source: Rick Engineering 2012
*Value interpolated between river stations
Note: Modeling includes mitigation area

During the 10-year flood event, WSEs in the channel are roughly equal to the elevation of the existing river banks. Thus, in a 10-year event, clapper rails will be forced from the river channel into adjacent uplands where they would be susceptible to predation by terrestrial and avian predators, or be swept downstream. This would occur under both existing and proposed conditions. Based on the 10-year flood model, which most closely resembles the low flow condition, the constructed Project would not affect river hydraulics and would not affect conditions that are favorable to the rail population.

During the 100-year event, WSEs in the river with the new bridge are equal to or lower than those under existing conditions (Table 4-15). Velocities of the 100-year flood under existing conditions are estimated as ranging from 2.9 fps to 9.7 fps. Existing velocities are erosional (6 fps or greater) from River Station 2.524, located approximately 475 ft west of the existing bridge, to River Station 2.675, located approximately 320 ft east of the existing bridge (Table 4-15). Existing velocities upstream and downstream of these river stations are in a transitional zone between erosional and depositional.

Velocities of the 100-year flood with the proposed project implemented are predicted to remain in a moderate to erosional range from 2.9 fps to 10.7 fps. Velocities predicted by the hydraulic model in the proposed 100-year condition are the same as existing conditions from River Station 1.979 to 2.231 (the downstream end of the river reach modeled). Velocities predicted by the hydraulic model in the proposed 100-year condition are lower than existing conditions from River Station 2.341 to River Station 2.524 of the river reach modeled. This reduction is due to the lowering of the existing fallow agricultural fields in the southern channel overbank (area outside of the river channel) for mitigation, as well as the reduction in peak flow rate due to a portion of discharge exiting the channel through the proposed trapezoidal weir (located between River Station 2.524 and 2.590). However, proposed condition 100-year velocities are higher than existing 100-year velocities from River Station 2.59 (downstream of the existing bridge) through the proposed bridge structure, as well as through the upstream end of the river reach modeled. The velocity predicted with the project would be erosional while the velocity in existing conditions would be below the 6 fps threshold for erosional conditions at River Station 2.675. The velocity predicted with the project would be less than erosional from River Station 2.732 to 2.844. Based on this hydraulic modeling, the project would increase the potential for erosion in the river from River Station 2.59 to 2.675.

Table 4-15. Hydraulic Conditions Modeling Results for 100-year Flood

Cross Section #	Existing Water Surface Elevation (ft above MSL)	Proposed Project Water Surface Elevation (ft above MSL)	Existing Channel Velocity ft per second (fps)	Proposed Project Channel Velocity ft per second (fps)
2.844	22.6	22.4	3.6	3.8
2.782	22.5	22.3	3.5	3.7
2.732	22.3	21.8	4.5	5.8
2.675	21.9	20.8	5.7	8.4
2.649	21.2*	20.2	7.3*	9.2
2.637 Eastern Alignment Bridge	20.9*	20.1*	8.0*	9.6*
2.625	20.7*	20.0	8.8*	10.0
2.623	20.6	19.8*	8.9	10.3*
2.614	20.2	19.6	9.2	10.6
2.6115 Existing Bridge	20.1*	19.5*	9.4*	10.6*
2.609	19.9	19.4	9.6	10.7
2.59	19.8	19.5	8.8	9.0
2.524	19.6	19.7	6.5	4.5
2.439	19.5	19.4	4.7	4.4
2.341	19.3	19.3	4.4	4.0
2.231	19.2	19.2	3.2	3.2
2.155	19.1	19.1	2.9	2.9
2.06	19.1	19.1	3.3	3.3
1.979	19.0	19.0	2.9	2.9

Source: Rick Engineering 2012
*Value interpolated between river stations
Note: Modeling includes mitigation area

The increased erosion upstream and downstream of the proposed bridge would affect only a small portion of occupied clapper rail habitat and the extent of those impacts can only be speculated. Dr. Chang's Fluvial 12 model (Chang 2005) demonstrated how the river bed scours during the peak of the 100-year event, then resumes its pre-flood profile as the discharge lessens and sediment is deposited. Thus, it is possible that there would be little or no change in the bed profile following the 100-year event. However, the freshwater marsh habitat in the river channel that provides cover and food for the rail would likely be scoured away by erosional water velocities precluding use by rails in the short term until vegetation becomes reestablished. This would likely occur under both existing and proposed conditions.

The effects of the proposed mitigation on the JPA mitigation site on river hydraulics was included in the HEC-RAS model and is reflected in the proposed conditions in Tables 4-14 and 4-15. It should be noted that vegetation with the freshwater mitigation site is not expected to scour due to lower velocities allowed by the berm and weir. Thus, this area would provide rail habitat immediately following the receding flood waters

During the 100-year flood event, the area upstream of the existing and proposed bridge would be submerged from approximately San Dieguito Road to the south to Via De La Valle to the north. Similarly the area downstream of the bridge would be submerged from approximately El Camino Real to Via De La Valle to the north. Clapper rails would be forced onto road ways and private properties where they would be susceptible to predation and/or injury from other sources, or they would be swept downstream.

The choice of construction techniques, e.g., trestle(s) or berm(s) may affect functioning of clapper rail habitat following construction. Removal of the berm to preconstruction contours following construction is essential for maintaining the unique hydraulic and biological characteristics of the Project area. Removal of soils that have been compacted may result in rebound, forming higher areas where the berms had been. Anticipating such a rebound that does not occur may result in areas that are lower than preconstruction contours resulting in deeper water where the berms had been. Fixing either condition would be difficult once the berm has been removed. Vibrating temporary piles out of the river may result in holes where the piles previously had been, resulting a series of low areas across the river. With no access to the river bottom, filling these holes to preconstruction contours may not be possible.

The effects of this mitigation area on the floodplain (water surface elevations and velocities) are shown in the project hydraulic study (Rick 2012), and the detailed hydraulic design of the actual mitigation concept (i.e. – sizing of the inflow and outflow weir, and elevations of the weir) is provided in the reports by Chang Consultants (Chang 2005).

4.4.7. Least Bell's Vireo

Least Bell's vireo is a small, migratory insectivore federally and state listed as endangered. It prefers dense riparian vegetation for foraging and nesting. The California distribution of least Bell's vireo includes Santa Barbara, Riverside, and San Diego counties. Least Bell's vireos typically begin to arrive on their breeding grounds by mid- to late March and begin to depart by late July; most have left the breeding grounds by September. Typically, male vireos arrive and establish territories and are followed by females a few days later. Site fidelity is high among adult least Bell's vireo, with many birds returning to the same territory each year and even using the same shrub as previous years (Salata 1983, Kus 2002). Populations of least Bell's vireo have declined drastically due to extensive loss of riparian habitat to agriculture and urbanization, nest parasitism by the brown-headed cowbird, and nest predation.

4.4.7.1. SURVEY RESULTS

Focused surveys for least Bell's vireo were conducted in 2012 for the SANDAG San Dieguito Lagoon W19 Wetland Mitigation Project (Appendix F). The survey area defined for these focused surveys extended approximately 500 ft west and east of the bridge and consisted of all riparian habitat within the W19 project area (primarily west of the bridge) and all riparian habitats and freshwater marsh habitat up to 500 ft east of the bridge.. A single territorial male least Bell's vireo was detected within disturbed land in the JPA mitigation areas. This male vireo was detected during six of the eight surveys. This individual was detected vocalizing from a monotypic stand of tree tobacco 100 to 200 ft west of the bridge.

Least Bell's vireo was also detected in disturbed southern willow scrub less than 100 ft west of the BSA during the southwestern willow flycatcher habitat assessment conducted in 2011 (Figure 6e). Both a male and female were detected; the male was vocalizing from several perch sites, and the female made a "scolding" call from within a densely vegetated area. Based on these behaviors, it is assumed that the pair had an active nest. An updated habitat assessment conducted for the Project in 2004 revealed two occupied least Bell's vireo territories. One territory supported a single adult male and was located in disturbed southern willow scrub north of the San Dieguito River and west of El Camino Real. The second supported a pair and was located in disturbed southern willow scrub south of the river and west of El Camino Real. While focused survey efforts have had differing results (negative in 2009 [Appendix G], positive in 2004), for the purposes of this report all areas of disturbed southern willow scrub occurring in association with the San Dieguito River are considered to be occupied by least Bell's vireo (Figures 6a-6e).

4.4.7.2. Avoidance and Minimization

Construction of the western and Central Alignment Alternatives would span three least Bell's vireo breeding seasons, and construction of the Eastern and the Roundabout Alignment Alternatives would span two breeding seasons. Indirect impacts to least Bell's vireo can be avoided by implementing the same general and specific measures proposed to avoid and minimize indirect impacts to light-footed clapper rail presented previously. As least Bell's vireo are migratory, restricting construction activities within the river corridor during the combined least Bell's vireo/clapper rail breeding season (February 1 – September 30) and restricting noise levels of construction activities outside of the river corridor to 60dBA or ambient will minimize direct and indirect impacts to this species.

4.4.7.3. Project Impacts

Western Alignment Alternative

Direct impacts to least Bell's vireo would not result from the Western Alignment Alternative. Project activities would be restricted in the river corridor each year during the breeding season for least Bell's vireo (three breeding seasons for the Western Alignment Alternative). Indirect impacts to this species, however, would result from impacts to disturbed southern willow scrub within the Western Alignment Alternative alignment. All disturbed southern willow scrub associated with the San Dieguito River provides suitable nesting and foraging habitat for least Bell's vireo and is considered occupied whether or not least Bell's vireo was detected within that particular alternative alignment (Figure 6a).

Central Alignment Alternative

No direct or indirect impacts to least Bell's vireo would result from construction of the Central Alignment Alternative. Project activities would be restricted in the river corridor each year during the breeding season for this species (three breeding seasons for the Central Alignment Alternative).

Indirect impacts to this species, however, would result from impacts to very small areas of disturbed southern willow scrub occurring along the San Dieguito River within the Central Alignment Alternative alignment. All disturbed southern willow scrub associated with the San Dieguito River provides suitable nesting and foraging habitat for least Bell's vireo and is considered occupied whether or not least Bell's vireo was detected within that particular alternative alignment (Figure 6b). The isolated patch of disturbed southern willow scrub occurring along El Camino Real is a remnant area that does not provide suitable foraging or nesting habitat for the vireo, and impacts to this area would not be considered indirect impacts to this species.

Eastern Alignment Alternative

Direct impacts to least Bell's vireo would not result from the construction of the Eastern Alignment Alternative because Project activities would be restricted in the river corridor each year during the breeding season for this species (two breeding seasons for the Eastern Alignment Alternative). However, indirect impacts to this species would result from impacts to disturbed southern willow scrub associated with the demolition of the existing bridge. All disturbed southern willow scrub occurring in association with the San Dieguito River provides suitable nesting and foraging habitat for least Bell's vireo (Figure 6c). Throughout the Project area, this vegetation community is considered occupied whether or not least Bell's vireo was detected within that particular alternative alignment.

Roundabout Alignment Alternative

Direct impacts to least Bell's vireo would not result from the construction of the Roundabout Alignment Alternative because Project activities would be restricted in the river corridor each year during the breeding season for this species (two breeding seasons for the Roundabout Alignment Alternative). However, indirect impacts to this species would result from impacts to disturbed southern willow scrub associated with the demolition of the existing bridge. All disturbed southern willow scrub occurring in association with the San Dieguito River provides suitable nesting and foraging habitat for least Bell's vireo (Figure 6d). Within the Project footprint, this vegetation community is considered occupied whether or not least Bell's vireo was detected within that particular alternative alignment.

JPA Mitigation Area

Implementation of the proposed wetland creation/enhancement plan within the JPA mitigation area would not result in direct impacts to least Bell's vireo. This species is known to occur within the boundaries of the JPA mitigation area (Figure 6e). However, direct impacts to least Bell's vireo would not occur because all Project activities would be restricted during the breeding season for this species.

Implementation of the proposed wetland creation/enhancement plan within the JPA mitigation area would result in the enhancement of existing disturbed southern willow scrub, which would increase the function and value of this habitat making it higher quality nesting habitat for the least Bell's vireo.

As least bell's vireo are migratory, they would not be present in the Project area during the non-breeding season. Therefore, indirect impacts from noise and vibration associated with pile driving activities are not anticipated.

4.4.7.4. COMPENSATORY MITIGATION

No direct impacts to this species area anticipated from any of the four alternatives or the JPA mitigation area. Habitat-based mitigation would be provided to compensate for impacts to occupied least Bell's vireo habitat. In the Project area, potential least Bell's vireo habitat consists of disturbed southern willow scrub occurring in association with the San Dieguito River. To offset anticipated Project impacts to this habitat, disturbed southern willow scrub would be created and enhanced at a ratio greater than 3:1. Mitigation for impacts to tamarisk scrub would also be provided because tamarisk scrub is situated adjacent to disturbed southern willow scrub and may be utilized as foraging habitat by least Bell's vireo. Mitigation would be accomplished through implementation of the conceptual restoration plan within the JPA mitigation area, which is in the San Dieguito River watershed.

4.4.7.5. CUMULATIVE IMPACTS

The proposed Project is not expected to result in significant cumulative impacts to least Bell's vireo. No direct impacts to this species are anticipated. Although the proposed Project would result in indirect impacts to the vireo as a result of Project impacts to disturbed southern willow scrub, the proposed Project would conform to the requirements of the MSCP. The vireo is considered covered by the MSCP because the population will be adequately conserved (93%) provided that MSCP is followed.

Other projects planned in the vicinity of the El Camino Real Bridge Replacement Project area would also have breeding season restrictions and be required to conform to the MSCP or wildlife agencies requirements if outside of an approved MSCP. Of those identified in the Project vicinity, only one nearby project involves restoration, enhancement, and creation of wetland habitats. It is likely that seasonal restrictions on construction activities also would apply to that project in order to minimize indirect noise impacts and avoid disruption of the normal activities of least Bell's vireo and other wildlife species utilizing the San Dieguito River as a wildlife corridor.

4.5. Water Quality – Best Management Practices (BMPs)

The drainages that currently exist along El Camino Real and Via de la Valle will be modified under all Project alternatives to handle 61.6 cfs flows. These flows will ultimately enter the San Dieguito River and lagoon. In order to minimize and avoid discharge of contaminants, such as polyaromatic hydrocarbons, to the river BMPs will be incorporated into the project during the design phase. These BMPs may include, but are not limited to, retention basins, vault systems or vegetated swales to offset potential negative effects on the sensitive species and habitats of the river. During construction, BMPs such as silt fences and Baker tanks will be installed to minimize discharge of sediment and associated contaminants. A Stormwater

Pollution Prevention Plan will be prepared for the project that identifies appropriate BMPs during construction.

4.6. Operational Noise Attenuation Measures

The Project will result in increased traffic and associated noise from expanding the current 2-lane bridge to four lanes. In their 2006 letter regarding the Project, the resource agencies requested that noise attenuation measures, such as noise walls or rubberized concrete be incorporated into the bridge design. While noise walls appear to be infeasible, during final design, the City will consider using rubberized concrete on the bridge during final design to reduce noise resulting from tire-road contact.

Chapter 5. Results: Permits and Technical Studies for Special Laws or Conditions

5.1. Clean Water Act

In California, before USACE will issue a Section 404 permit, applicants must apply for and receive Section 401 water quality certification or a waiver from the RWQCB. Under Section 401 of the CWA, the RWQCB regulates at the state level all activities that are regulated at the federal level by USACE. Therefore, RWQCB jurisdiction usually matches the jurisdictional boundaries for waters of the U.S. (mapped at the OHWM). However, if waters are determined not to be waters of the U.S., they may still be subject to RWQCB jurisdiction based on the Porter-Cologne Act.

5.2. Migratory Bird Treaty Act

Impacts to nesting birds protected by the MBTA and similar provisions of the CDFW Code can occur if work is conducted during the breeding season (February 1 to August 31). There is potential for raptors and other early nesting species such as hummingbirds to initiate nests as early as January. However, in general, the peak nesting season is February through August. All vegetation, native or nonnative, provides habitat that may be used by nesting birds.

In order to avoid direct impacts to nesting birds, removal of vegetation would occur outside of the breeding season for birds. Typically, if a preconstruction nesting bird survey determines that nesting birds do not occur in the vicinity of the site (typically 300 ft for passerine birds and 500 ft for raptors), removal of vegetation can occur within the breeding season for avian species. However, for this Project, the presence of least Bell’s vireo precludes the removal of vegetation around a 300-foot buffer from the edge of occupied habitat from February 1 through September 30. All areas of disturbed southern willow scrub occurring along the San Dieguito River are considered occupied by least Bell’s vireo.

If vegetation removal is to occur from January to February 14, a preconstruction nesting bird survey for raptors and other early nesting species would be conducted. If a nest is found, methods need to be implemented to avoid impacts. This would consist of a no-work buffer zone placed around the nest until the adults are no longer using it or the young have fledged. The specific buffer width would be determined by a qualified biologist at the time of discovery. These will vary based on site conditions and type of work to be conducted. According to the City of San Diego Biology Guidelines (City of San Diego 2002), for areas within the MHPA, a 900-foot buffer will be placed around the nesting site of northern harrier. Although northern harrier was detected in the JPA mitigation area, this species is not expected to nest in the BSA.

5.3. National Environmental Policy Act

Potentially substantial impacts to biological resources were identified for the Project, which include direct, indirect, and/or cumulative impacts. All potentially substantial impacts are fully mitigated with the combination of measures presented in Chapter 4 and by the MSCP.

5.4. Fish and Wildlife Coordination Act

During the Section 404 application process, USACE will offer USFWS (and other resource agencies) the opportunity to comment.

5.5. Federal Endangered Species Act

Light-footed clapper rail and least Bell's vireo, both federally endangered species, are present within the BSA. The Project would result in impacts to occupied habitat for these species. Both of these species are Covered Species under the MSCP. With implementation of the avoidance and minimization measures listed in Section 4.4, the proposed Project will be in conformance with the MSCP. However, because light-footed clapper rail is a fully protected species for which "take" authorization is not provided under the MSCP, a formal Section 7 consultation pursuant to the FESA would be required to ensure the proposed avoidance and minimization measures would adequately protect the species and avoid "take."

5.6. Executive Order 13112 - Invasive Species

Seeds of invasive species can be transported to new areas through a variety of mechanisms including vehicles and animals. Recurring fires can encourage the establishment of invasive species as well as some forms of routine land maintenance (e.g., discing). The impacts invasive species have on southern California native vegetation communities and the plants and animals that reside within these areas are in some circumstances catastrophic. Because of this, there is a need to identify and recommend measures for ground-disturbing projects that would reduce and/or avoid further transport of invasive species into natural areas. A list of noxious plant species that might become established in the Project area is presented in Table 3-2.

All Project alternatives would disturb the ground and remove both nonnative and native vegetation. To ensure the Project does not promote the introduction of invasive species to the surrounding undeveloped areas, construction equipment would be cleaned of mud or other debris that may contain invasive plants and/or seeds and would be inspected to reduce the potential of spreading noxious weeds before mobilizing to the site and before leaving the site, during the course of construction. Also, trucks with loads carrying vegetation would be covered, and vegetation materials removed from the site would be disposed of in accordance with applicable laws and regulations. In addition, invasive species will be monitored during the protracted construction period and removed or treated in an environmentally sound manner. As the BSA currently supports extensive areas of non-native species, in particular salt cedar (*Tamarix ramosissima*) and tree tobacco (*Nicotiana glauca*) control of such species during and after construction is critical to preventing establishment in the Project area, including the Mitigation site.

5.7. California Department of Fish and Wildlife Code, Section 1600-1616

All four alternatives would result in encroachment into state streambeds. A Streambed Alteration Agreement will be necessary and will be acquired through CDFW. CDFW has been involved with Project planning.

5.8. California Coastal Commission

All four alternatives would encroach in CCC jurisdictional wetlands as a portion of the project occurs within the Coastal Zone. A CCC Coastal Development permit will be required for the Project. The CCC has been informed of the Project.

5.9. Porter-Cologne Water Quality Act

Porter-Cologne compliance will be coordinated with the CWA Section 401 certification. Separate permitting will not be necessary.

5.10. California Environmental Quality Act

The Project has been identified as having the potential to significantly impact biological resources present within the BSA. With implementation of the measures provided in Chapter 4 in conjunction with coverage under the MSCP, all potentially significant impacts are fully mitigated to a level that would be less than significant.

5.11. Native Plant Protection Act

CDFW will be contacted at least 10 days in advance of any ground disturbance to allow CDFW to salvage special-status plant species that would otherwise be destroyed. This ensures compliance with the NPPA. No further action is necessary.

5.12. Wildlife Corridors

A minimum of one passageway would be built into the temporary work area within the river channel to allow terrestrial wildlife species, such as light-footed clapper rail, to travel through the work area and allow wildlife to continue to have access to areas upstream and downstream of the work area within the San Dieguito River corridor. Temporary fencing would be installed parallel to the passageway to discourage wildlife from accessing the construction areas. Construction activities would likely disrupt full use of this portion of the San Dieguito River channel as a wildlife corridor. However, this disruption would be temporary because construction activities within and over the river would be restricted to the non-breeding season of sensitive bird species and to daylight hours, and the proposed passageways would allow wildlife to continue to move through the area. For some construction activities, equipment can be removed from the river channel at the end of each work day. However, it is not practical to remove the crane and the platform needed for some work activities at the end of each work day. These would only be removed when the predicted chance of precipitation is great than 50% for 0.5 inch of rain or greater. Secondary containment measures would be installed underneath the crane at the end of each work day. Such measures may include placing a plastic reservoir that extends the width and length of the underside of the crane that has the capacity to contain up to 120% the amount of liquid in the crane.

The San Dieguito River would function as a wildlife corridor without interruption during the breeding season (February 1 through September 30) and in the night during construction in the non-breeding season (October 1 through February 14). Wildlife would be able to move freely through the area once the Project is completed.

5.13. City of San Diego, Environmentally Sensitive Lands

Development in the City of San Diego is subject to restrictions discussed in the City of San Diego Land Development Code Biology Guidelines (2002). These guidelines have been prepared to ensure the consideration of environmentally sensitive lands located in the vicinity of proposed development. The City of San Diego Biology Guidelines Consistency Summary (provided as Appendix H) also addresses these guidelines. The following guidelines apply to the proposed Project:

1. *Impacts to wetland areas are to be avoided if possible. Where impacts are unavoidable, mitigation would be proposed at specified ratios and would be consistent with the ACOE* [USACE] *policy of "no net loss" of wetlands. Unavoidable impacts include those that allow reasonable use of essential public facilities such as essential roads, sewer and water lines where no feasible alternative exists.*

The proposed Project would result in unavoidable impacts to wetland habitats as defined by the City of San Diego. As a result, mitigation would be provided per the mitigation ratios established in the City's Land Development Code Biology Guidelines (2002) and would be consistent with the USACE policy of "no net loss" of wetlands.

2. *A wetland buffer must be maintained around all wetlands as appropriate to protect the functions and values of the wetland. In the coastal zone, a minimum 100-foot buffer is required.*

   El Camino Real crosses over the San Dieguito River, which precludes the maintenance of a wetland buffer between the proposed widened road and bridge and wetlands associated with the San Dieguito River. Currently, there is no wetland buffer between the existing bridge and wetland habitat associated with the San Dieguito River.

3. *Within the MHPA, development must be located on the least sensitive portion of the site and designed to avoid covered species where feasible.*

   Four different alternatives have been proposed for this Project. Impacts occurring to sensitive vegetation communities within the MHPA are small, especially for the Eastern Alignment and Roundabout Alignment alternatives. Mitigation would be provided for all Project impacts to sensitive vegetation communities.

Although the San Dieguito River and associated wetlands also are considered sensitive habitats, impacts to such areas are unavoidable due to the nature of the Project (i.e., widening the bridge as it crosses the San Dieguito River). Thus, impacts to occupied light-footed clapper rail are unavoidable. Mitigation in the form of habitat creation, restoration, and enhancement is proposed to offset Project impacts to such sensitive areas. This is discussed further in Sections 4.1 and 4.2.

5.14. Multiple Species Conservation Program

Compliance with the MSCP is necessary to obtain compensation for potentially significant impacts to biological resources caused by the Project. For complete details of each resource, level of impact, and mitigation, see Chapter 4.

The MHPA established within the City boundaries delineates core biological areas and corridors targeted for conservation. Limited development is allowed within the MHPA (City of San Diego 1997). Portions of the Project area are situated within the MHPA (Figure 3).

The subarea plan includes one specific MHPA guideline that directly addresses improvements to El Camino Real. It requires that once funding becomes available, a culvert be constructed for wildlife movement where El Camino Real crosses the outlet of Gonzales Canyon into the San Dieguito River. The proposed Project area is located north of the portion of El Camino Real that crosses Gonzales Canyon. Consequently, this specific culvert would not be included in the Project design.

Additional requirements of the MSCP program that apply to the proposed Project are found in Section 1.4 of the City of San Diego subarea plan, which describes acceptable land uses planned or existing adjacent to the MHPA. The proposed road widening and bridge replacement is an essential public facility. According to the Framework Plan for the Project area, El Camino Real is designated a four-lane major roadway (City of San Diego 1995). The proposed Project would conform to the following land use guidelines provided in the subarea plan and thus would be considered a land use compatible with the goals of the MSCP, with the exception of the Western Alignment Alternative which proposes the storage of materials in the MHPA (see item # 8 below). Where mitigation is required for MSCP conformance, specific measures to be implemented upon Project construction are described in detail in Chapter 4. The City of San Diego Biology Guidelines Consistency Summary (provided as H) also addresses these guidelines.

1. *Temporary construction areas and roads, staging areas, or permanent access roads must not disturb existing habitat unless determined to be unavoidable. If temporary habitat disturbance is unavoidable, then restoration of, and/or mitigation for, the disturbed area after project completion would be required.*

   For all phases of construction, staging would occur in previously disturbed areas. Temporary construction fencing and silt fencing would be installed around the perimeter of the staging area for the duration of construction to ensure that habitats adjacent to the Project area are not impacted and to contain sediment.

   All access related to Project construction would be attained through areas that have been previously disturbed or already impacted by Project components. Additional access roads would not be necessary.

2. *Construction and maintenance activities in wildlife corridors must avoid significant disruption of corridor usage. Training of construction crews and field workers must be conducted.*

   A minimum of one passageway would be built into the temporary work area within the river channel to allow terrestrial wildlife species, such as light-footed clapper rail, to travel through the work area and allow wildlife to continue to have access to areas upstream and downstream of the work area within the San Dieguito River corridor. Temporary fencing would be installed parallel to the passageway to discourage wildlife from accessing the construction areas. Construction would be restricted during the combined bird nesting season (February 1 to September 30), and construction activities would occur during daylight hours. Temporary construction lighting has not been proposed as part of the Project. Training of construction crews and field workers by a qualified biologist would be provided in order to avoid unnecessary impacts to biological resources in the area. Partial disruption to the wildlife corridor would be temporary because construction activities within and over the river would be restricted to the non-breeding season of sensitive bird species and to daylight hours, and the proposed passageways would allow wildlife to continue to move through the area.

3. *Roads in the MHPA will be limited to those identified in Community Plan Circulation Elements, collector streets essential for area circulation, and necessary maintenance/emergency access roads. Local streets should not cross the MHPA except where needed to access isolated development areas.*

   The Project is considered a four-lane major roadway essential for area circulation and, therefore, is compatible with the MSCP. The Project involves widening or replacing the existing road in order to accommodate additional travel lanes and other proposed features.

4. *Where possible, roads within the MHPA should be narrowed from existing design standards to minimize habitat fragmentation and disruption of wildlife movement and breeding areas. Roads must be located in lower quality habitat or disturbed areas to the extent possible.*

   The proposed Project would result in a wider bridge crossing the San Dieguito River. The bridge would be higher than the existing bridge, and would not disrupt wildlife movement through the area.

5. *Fencing or other barriers will be used where it is determined to be the best method to achieve conservation goals and adjacent to land uses incompatible with the MHPA. For example, use chain link or cattle wire to direct wildlife to appropriate corridor crossings, natural rocks/boulders or split rail fencing to direct public access to appropriate locations, and chain link to provide added protection of certain special-status species or sensitive habitats (e.g. vernal pools).*

   At both ends of the widened bridge, fencing would be erected to direct pedestrian and bicycle traffic north and south along the paved road and away from the river bed.

6. *Lighting shall be designed to avoid intrusion into the MHPA and effects on wildlife.*

   Permanent lighting in areas of wildlife crossings would consist of low-sodium lighting. Construction activities would only be conducted during daylight hours so that temporary lighting is not necessary.

7. *Signage will be limited to access and litter control and educational purposes.*

   Signage erected along the Project alignment will be only for the purposes of education, and access and litter control.

8. *Prohibit the storage of material (e.g. hazardous or toxic, chemicals, equipment, etc.) within the MHPA and ensure appropriate storage per applicable regulations in any areas that may impact the MHPA, especially due to potential leakage*.

   As presented earlier, staging would occur in a previously disturbed area that is located outside of the MHPA. For most construction activities, equipment can be removed from the MHPA at the end of each work day. However, it is not practical to remove the crane and the platform needed for some work activities at the end of each work day. For the Western Alignment Alternative, the crane would be kept on the work platform, which would be partially within the MHPA, unless the predicted chance of precipitation is greater than 50% for 0.5 inch of rain or greater. For all of the alternatives, secondary containment measures would be installed underneath the crane at the end of each work day. Such measures may include placing a plastic reservoir that extends the width and length of the underside of the crane that has the capacity to contain up to 120% the amount of liquid in the crane.

9. *Flood control should generally be limited to existing agreements with Resource Agencies unless demonstrated to be needed based on a cost benefit analysis and pursuant to a restoration plan. Floodplains within the MHPA, and upstream from the MHPA if feasible, should remain in a natural condition and configuration in order to allow for ecological, geological, hydrological and other natural processes to remain or be restored.*

   The proposed Project would not create the need for flood control measures. No increase in flood elevations over the predicted 100-year water surface elevation is anticipated.

10. *No berming, channelization, or man-made constraints or barriers to creek, tributary, or river flows should be allowed in any floodplain within the MHPA unless reviewed by all appropriate agencies, and adequately mitigated*.

    Stabilization of the north bank of the San Dieguito River would be accomplished through methods involving placing buried rip rap in an excavated bank separated from the existing habitat line so that wetlands would not be disturbed by the construction. No human-made constraints to the flows associated with the San Dieguito River would be implemented. The vegetated, protective berm constructed to prevent sedimentation in the planted coastal freshwater marsh wetlands mitigation area would be located outside of the river. The mitigation area would not affect river flows or sedimentation patterns.

11. *No riprap, concrete, or other unnatural material shall be used to stabilize river, creek, tributary, and channel banks within the MHPA. River, stream, and channel banks shall be natural, and stabilized where necessary with willows and other appropriate native plantings. Rock gabions may be used where necessary to dissipate flows and should incorporate design features to ensure wildlife movement*.

    Rip rap would be used under the proposed bridge because these areas would be too steep to vegetate naturally. The bridge abutments would be at a slope of 1.5:1 in order to avoid increasing 100-year flood elevations upstream from the new bridge and roadway raised on embankment across the floodplain. Open stabilization materials could not be effectively planted due to the steep slope and shading from the new bridge. It has been determined that most 100-year flood velocities with the proposed Project would be approximately the same as predicted for existing conditions. However, upstream of the proposed bridge, 100-year velocities would be higher. Therefore, the buried stabilization discussed in #10 above is proposed. With the exception of bank stabilization described in #10 above, additional channel stabilization would not be included as part of the proposed Project.

Because most of the alignment is located outside of the MHPA, the following land use adjacency guidelines also apply to the proposed Project. These guidelines address drainage, lighting, noise, invasives, and grading/land development implications and are discussed below.

1. *All new proposed parking lots and developed areas in and adjacent to the preserve must not drain directly into the MHPA. All developed and paved areas must prevent the release of toxins, chemicals, petroleum products, exotic plant materials, and other elements that might degrade or harm the natural environment or ecosystem processes within the MHPA. This can be accomplished using a variety of methods including natural detention basins, grass swales or mechanical trapping devices. These systems should be maintained approximately once a year or as often as needed, to ensure proper functioning.*

    The new alignment for El Camino Real would be designed so that it does not drain directly into the MHPA.

2. *Lighting of developed areas should be directed away from the MHPA. When necessary, lighting system should be shielded with non-invasive plant materials, berming, and/or other methods to protect the MHPA and special-status species from night lighting*.

    Permanent lighting associated with the proposed road and bridge widening would be directed down and away from the MHPA and, in areas of wildlife crossings, would consist of low-sodium lighting. Construction activities would only be conducted during daylight hours so that temporary lighting is not necessary.

3. *Uses in or adjacent to the MHPA should be designed to minimize noise impacts. Berms or walls should be constructed adjacent to commercial areas, recreational areas and any other use that may introduce noises that could impact or interfere with wildlife utilization of the MHPA.*

   The proposed Project would not generate traffic, and would not create new uses in or adjacent to the MHPA that would generate noise. The widened roadway would reduce congestion along the existing road and allow for greater vehicle speeds.

   However, due to the presence of federal and state endangered least Bell's vireo and light-footed clapper rail, mitigation would be proposed to offset indirect impacts to these species from construction and operational noise. Construction would be restricted during the nesting season (February 1 to September 30).

   Outside of the nesting season, construction activities would occur during daylight hours such that wildlife use of the San Dieguito River corridor may continue to some extent. Training of construction crews and field workers by a qualified biologist would be provided in order to avoid unnecessary impacts to biological resources in the area.

4. *No invasive nonnative plant species shall be introduced into areas adjacent to the MHPA (City of San Diego 1997).*

   Any proposed landscaping associated with the final Project design would utilize native plant species. Proposed planting palettes would only include native species. No nonnative species would be introduced into the Project area or the MHPA. To ensure the Project does not promote the introduction of invasive species to the surrounding undeveloped areas, construction equipment would be cleaned of mud or other debris that may contain invasive plants and/or seeds and would be inspected to reduce the potential of spreading noxious weeds before mobilizing to the site and before leaving the site, during the course of construction. Also, trucks with loads carrying vegetation would be covered, and vegetation materials removed from the site would be disposed of in accordance with applicable laws and regulations. Exotic species removed during construction would be properly handled to prevent sprouting or regrowth.

5. *New development adjacent to the MHPA may be required to provide barriers (e.g. non-invasive vegetation, rocks/boulders, fences, walls, and/or signage) along the MHPA boundaries to direct public access to appropriate locations and reduce domestic animal predation.*

Barriers, such as white, wood-faced fencing would be provided along the newly constructed road and bridge to direct the public and associated domestic animals away from the MHPA.

6. *Manufactured slopes associated with site development shall be included within the development footprint for projects within or adjacent to the MHPA.*

   All manufactured slopes associated with the proposed road and bridge are considered direct and permanent Project impacts. These areas of impact have been quantified in this NES.

In addition to MHPA guidelines developed for the Northern Area, land use considerations, and land use adjacency guidelines, the Project also conforms to the framework Management Plan presented in Section 1.5 of the MSCP subarea plan. The plan provides general goals for habitat management within the MHPA:

1. To ensure the long-term viability and sustainability of native ecosystem function and natural processes throughout the MHPA.
2. To protect the existing and restored biological resources from intense or disturbing activities within and adjacent to the MHPA while accommodating compatible public recreational uses.
3. To enhance and restore, where feasible, the full range of native plant associations in strategic locations and functional wildlife connections to adjoining habitat in order to provide viable wildlife and sensitive species habitat.
4. To facilitate monitoring of selected target species, habitats, and linkages in order to ensure long-term persistence of viable populations of priority plant and animal species and to ensure functional habitats and linkages.

The proposed Project alternatives conform to these goals through the implementation of measures, described in Chapter 4, which would avoid or minimize impacts to native ecosystems. Where impacts are unavoidable, compensatory mitigation in the form of habitat creation, restoration, and enhancement has been proposed. Implementation of mitigation measures would ensure that existing and restored biological resources in the area are protected while accommodating the widening of El Camino Real, a compatible public roadway, as well as recreational uses such as pedestrian and bicycle pathways and equestrian trails.

In order to facilitate the management goal of providing viable wildlife and sensitive species habitat, mitigation proposed for the Project would be accomplished primarily on the JPA mitigation area. This area would be used to create or enhance approximately 20.4 ac of native habitat that would contribute to the use of the San Dieguito River as a functional wildlife corridor.

The consideration of multiple alternatives for the proposed Project allows for the selection of the most ecologically feasible Project design. In addition, measures such as restricted construction schedules and noise attenuation barriers facilitate the avoidance of direct impacts and minimization of indirect impacts to special-status species such as light-footed clapper rail and least Bell's vireo. In this way, the proposed Project facilitates the monitoring of selected target species and habitats and promotes the long-term persistence of special-status species in the area.

Additional general management directives are presented in Section 1.5.2 of the MSCP subarea plan. These are general management guidelines that apply to all parts of the City of San Diego MSCP subarea, as appropriate. Topics addressed by these guidelines include but are not limited to: litter/trash and materials storage, adjacency management issues, invasive exotics control and removal, and flood control. Applicable guidelines have been addressed previously through the design of multiple Project alternatives developed to avoid and minimize impacts to sensitive habitats. The management guidelines also have been indirectly addressed in the discussion of Project conformance with the MSCP (Chapter 5.14), the City's Environmentally Sensitive Lands regulations in the Biology Guidelines (Chapter 5.13), and proposed mitigation (Chapter 4). Project-specific management activities on site would need to be included in the mitigation and monitoring plan. None of the Northern area specific management directives apply to the proposed Project.

5.14.1. MSCP-Covered Species

Covered species are those that are considered adequately protected within the City of San Diego MSCP provided that they are conserved according to the conditions of coverage provided in the City's MSCP Subarea plan. Light-footed clapper rail, least Bell's vireo, and northern harrier, all of which are present in the BSA, are covered by the MSCP. Thus, Project compliance with the MSCP will require conformance to the following conditions of coverage:

<u>Light-footed Clapper Rail.</u> This species is considered covered by the MSCP because 93% of its potential habitat, including southern coastal salt marsh, will be preserved by the MSCP plan. Wetland regulations that require no-net-loss of wetlands will provide additional protection for this species. The proposed Project conforms to the conditions of coverage established for this species because proposed mitigation will result in no-net-loss of wetlands. In the Project area, potential light-footed clapper rail habitat consists of coastal freshwater marsh. Construction of the Western Alignment and Central Alignment

alternatives would span three breeding seasons, and construction of the Eastern Alignment and Roundabout Alignment alternatives would span two breeding seasons. However, construction activities for all alternatives would be restricted in the river corridor during the combined bird nesting season (February 1 to September 30), thereby avoiding the nesting season for light-footed clapper rail. Exclusionary fence would be installed along the perimeter of the temporary work corridor within the river prior to construction activities commencing in this area during the non-nesting season. Clearance surveys would be conducted daily during installation of the fence and during removal of vegetation in this area. A qualified biologist would monitor construction activities for the duration of the Project to ensure that practicable measures are being employed to avoid incidental disturbance of habitat outside of the Project footprint.

No Project activities would be allowed during the breeding season for this species within any portion of the site where activities would result in noise levels exceeding 60 dB L_{eq} (or the ambient noise levels if they already exceed 60 dB L_{eq}) at the edge of the occupied habitat. If necessary, noise attenuation measures, such as berms or noise walls, can be implemented to ensure that noise levels would be maintained within the allowable level. To offset anticipated Project impacts to this habitat, coastal freshwater marsh will be restored, created, or enhanced at a 4:1 ratio. Mitigation will be accomplished within the San Dieguito River watershed. See Section 4.4 for more detail.

Least Bell's Vireo. This species is covered by the MSCP because 81% of its potential habitat, including riparian woodland and oak riparian forest, will be preserved by the MSCP plan. Wetland regulations that require no-net-loss of wetlands will provide additional protection for this species. The proposed Project conforms to the conditions of coverage established for this species because proposed mitigation will result in no-net-loss of wetlands. Mitigation for anticipated Project impacts to riparian scrub habitats will be provided at a 3:1 ratio. Mitigation will be accomplished within the San Dieguito River watershed. See Section 4.4 for more detail. Construction of the Western Alignment and Central Alignment alternatives would span three breeding seasons, and construction of the Eastern Alignment and the Roundabout Alignment alternatives would span two breeding seasons. Indirect impacts to the least Bell's vireo can be avoided by restricting Project activities during the combined bird nesting season (February 1 to September 30). No clearing or grubbing of occupied least Bell's vireo habitat would be allowed between February 1 and September 30. Furthermore, no Project activities would be allowed during the breeding season for this species within any portion of the site where activities would result in noise levels exceeding 60 dB L_{eq} (or the ambient noise level if they already exceed 60 dB L_{eq}) at the edge of the occupied habitat. If necessary, noise attenuation measures, such as berms or noise walls, can be implemented to ensure that noise level would be maintained within the allowable level.

Northern Harrier. This species is covered by the MSCP because 42% of potential nesting habitat, including salt marsh, freshwater marsh, and grasslands, and approximately 85,000 ac of its potential foraging habitat will be conserved. In order to avoid and minimize impacts to nesting bird species in the BSA, mitigation and construction activities would be restricted during the nesting season (February 1 through August 31) in accordance with the MBTA. If vegetation removal is to occur between February 1 and August 31, a nesting bird survey would be conducted prior to removal of vegetation be (see Section 5.2). According to the City of San Diego Biology Guidelines (City of San Diego 2002), for areas within the MHPA, a 900-foot buffer would be placed around the nesting site of northern harrier, and no construction activities would occur within the buffer until the nest is no longer active. The proposed habitats that would be created within the JPA mitigation area would provide suitable foraging habitat and potentially suitable nesting habitat for this species.

5.15. Other Plans

In addition to the City of San Diego MSCP, the proposed Project was designed to conform with other plans that pertain specifically to the management of the San Dieguito River Valley. Each of these plans is described below.

5.15.1. San Dieguito River Park Concept Plan

The proposed Project alignment occurs within the Focused Planning Area (FPA) of the San Dieguito River Park Concept Plan. Several documents pertaining to the long-range plans for the river park have been prepared. In 1994, the San Dieguito River Park Concept Plan was adopted to establish the goals for the future of the San Dieguito River Valley and to develop a planning framework for future park implementation (San Dieguito River Park JPA 2002).

With regard to improvements to existing public facilities such as El Camino Real and the associated bridge over the San Dieguito River, the concept plan indicates that these activities should be permitted within the FPA. Improvements must, however, be installed in a manner that minimizes environmental impacts, complies with CEQA, avoids impacts to existing and proposed park amenities, and is compatible with the objectives listed below:

- Preservation of open space
- Conservation of sensitive resources
- Protection of water resources
- Preservation of the natural floodplain
- Retention of agricultural uses

- Creation of recreational and educational opportunities
- Establishment of design guidelines (San Dieguito River Park JPA 2002)

In general, the proposed Project will conform to these objectives. Special-status species and sensitive habitats have been avoided to the extent possible. All alternatives facilitate the creation of recreational and educational opportunities, specifically the creation of public access via pedestrian walkways or bike lanes. Unavoidable impacts will be mitigated as required by the City of San Diego and the regulating agencies.

5.15.2. San Dieguito River Valley Regional Open Space Park Master Plan

The joint Environmental Impact Report/Environmental Impact Statement for the San Dieguito Wetland Restoration Project also describes the San Dieguito River Park Master Plan that encompasses the entire restoration Project area and was prepared in accordance with the JPA Park Concept Plan. The primary objective of the Master Plan is to convert, to the extent feasible, previously filled or otherwise disturbed areas within the planning boundaries to habitat types that were historically found in and around the San Dieguito Lagoon. This conversion will involve restoring and maintaining tidal influence to existing wetlands, excavating additional areas to recreate tidal wetlands, restoring freshwater drainages and facilitating the growth of southern willow scrub habitat, vegetating disturbed agricultural fields to appropriate upland habitats, and removing exotic invasives from natural areas (San Dieguito River Park JPA 2002/USFWS 2000).

Thus, the proposed El Camino Road and Bridge Widening project conforms conceptually with the objectives of the JPA Park Concept Plan and the JPA Park Master Plan in that each of these projects involve wetland restoration, creation, enhancement, and preservation. At this time, the JPA mitigation area is being proposed as a mitigation site for this Project; the parcel is located within the San Dieguito River Valley and has been previously identified by the above-named plans as an area designated for future wetland restoration.

The JPA has constructed an extension of the Del Mar Segment of the Coast to Crest Trail that traverses the BSA. The trail extends eastward from its former terminus at Horse Park and terminates just west of El Camino Real. This existing trail would be impacted by the proposed Western and Central Alignments should they be implemented. Future extensions of the trail would extend beneath the north bridge abutment for all alternatives. The trail undercrossing will be set at the 10-year flood level and will provide 12 ft of vertical clearance between the trail surface and the underside of the bridge. The Project is considered an asset to the construction of the trail as all alternatives will accommodate the safe crossing of El Camino Real, which is a critical link in the trail system. However, should the trail extension be constructed prior to construction of the bridge, recreational use of this trail may be interrupted for the entire construction period, approximately 2.5 – 3 years. Should construction of the trail extension occur concurrently with bridge construction, the two projects may temporarily interfere with one another.

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Appendix A
Plant Species Detected in the Biological Survey Area

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Appendix A. Plant Species Detected in the Biological Survey Area

Scientific Name	Common Name	Special Status
MAGNOLIID-PIPERALES		
Saururaceae - Lizard's-Tail Family		
Anemopsis californica	Yerba Mansa	
MONOCOTS		
Agavaceae - Agave Family		
* *Agave americana*	American Century Plant	
Arecaceae - Palm Family		
* *Phoenix canariensis*	Canary Island Date Palm	
* *Syagrus romanzoffiana*	Queen Palm	
* *Washingtonia robusta*	Mexican Fan Palm	
Cyperaceae - Sedge Family		
Cyperus esculentus	Yellow Nutgrass	
Schoenoplectus californicus	California Bulrush	
Schoenoplectus pungens var. longispicatus	Common Threesquare	
Juncaceae - Rush Family		
Juncus acutus ssp. leopoldii	Southwestern Spiny Rush	CRPR 4.2
Poaceae - Grass Family		
* *Bromus diandrus*	Ripgut Grass	
* *Bromus hordeaceus*	Soft Chess	
* *Cortaderia selloana*	Pampas Grass	
* *Cynodon dactylon*	Bermuda Grass	
Distichlis spicata	Saltgrass	
* *Hordeum murinum ssp. leporinum*	Hare Barley	
* *Lolium multiflorum*	Italian Ryegrass	
* *Polypogon monspeliensis*	Annual Beard Grass	
Typhaceae - Cattail Family		
Typha domingensis	Southern Cattail	
EUDICOTS		
Aizoaceae - Fig-marigold Family		
* *Carpobrotus chilensis*	Sea-Fig	
* *Carpobrotus edulis*	Hottentot Fig	
* *Mesembryanthemum nodiflorum*	Slender-Leaved Iceplant	

Scientific Name	Common Name	Special Status
* *Tetragonia tetragonioides*	New Zealand Spinach	
Amaranthaceae - Amaranth Family		
* *Amaranthus sp.*	Amaranth	
Anacardiaceae - Sumac Or Cashew Family		
Rhus integrifolia	Lemonadeberry	
Apiaceae - Carrot Family		
* *Apium graveolens*	Common Celery	
* *Foeniculum vulgare*	Sweet Fennel	
Osmorhiza brachypoda	California Sweet-Cicely	
Asteraceae - Sunflower Family		
Ambrosia psilostachya	Western Ragweed	
Artemisia californica	California Sagebrush	
Artemisia palmeri	San Diego Sagewort	CRPR 4.2
Baccharis pilularis	Chaparral Broom, Coyote Brush	
Baccharis salicifolia	Mule-Fat, Seep-Willow	
Baccharis sarothroides	Broom Baccharis	
Bahiopsis laciniata	San Diego Sunflower	CRPR 4.2
Cirsium occidentale	California Thistle	
Conyza canadensis	Horseweed	
* *Cotula australis*	Australian Brass-Buttons	
* *Cynara cardunculus*	Artichoke Thistle	
Encelia californica	California Encelia	
* *Glebionis coronaria*	Crown Daisy	
Hazardia squarrosa	Sawtooth Goldenbush	
* *Helminthotheca echioides*	Bristly Ox-Tongue	
Heterotheca grandiflora	Telegraph Weed	
Isocoma menziesii	Spreading Goldenbush	
Iva hayesiana	San Diego Marsh-Elder	CRPR 2.2
Jaumea carnosa	Fleshy Jaumea	
* *Lactuca serriola*	Prickly Lettuce	
Laënnecia coulteri	Coulter's Horseweed	
Pluchea sericea	Arrow Weed	
* *Senecio vulgare*	Common Groundsel	
* *Sonchus asper*	Spiny Sow-Thistle	

Scientific Name	Common Name	Special Status
* *Sonchus oleraceus*	Common Sow-Thistle	
Stephanomeria virgata	Rod Wirelettuce	
Xanthium strumarium	Cocklebur	
Boraginaceae - Borage Family		
Amsinckia eastwoodiae	Large-Flower Fiddleneck	
Heliotropium curassavicum	Salt Heliotrope	
Brassicaceae - Mustard Family		
* *Brassica nigra*	Black Mustard	
* *Coronopus didymus*	Wart-Cress	
* *Hirschfeldia incana*	Short-Podded Mustard	
* *Lepidium latifolium*	Broad-Leaved Peppergrass	
* *Raphanus sativus*	Wild Radish	
* *Sisymbrium irio*	London Rocket	
Caryophyllaceae - Pink Family		
* *Spergularia bocconii*	Boccone's Sand Spurry	
Chenopodiaceae - Goosefoot Family		
Atriplex prostrata	Spearscale	
* *Atriplex semibaccata*	Australian Saltbush	
* *Bassia hyssopifolia*	Five-hook Bassia	
* *Chenopodium album*	Lamb's Quarters	
* *Chenopodium murale*	Nettle-Leaf Goosefoot	
* *Dysphania ambrosioides*	Mexican Tea	
Salicornia pacifica	Pacific Pickleweed	
* *Salsola tragus*	Prickly Russian-Thistle	
Suaeda nigra	Bush Seepweed	
Convolvulaceae - Morning-Glory Family		
Cressa truxillensis	Alkali Weed	
Euphorbiaceae - Spurge Family		
* *Ricinus communis*	Castor Bean	
Fabaceae - Legume Family		
* *Medicago polymorpha*	California Burclover	
* *Melilotus albus*	White Sweetclover	
* *Melilotus officinalis*	Yellow Sweetclover	
Frankeniaceae - · Frankenia Family		
Frankenia salina	Alkali-Heath	

Scientific Name	Common Name	Special Status
Geraniaceae - Geranium Family		
* *Erodium botrys*	Long-Beak Filaree	
Malvaceae - Mallow Family		
* *Malva parviflora*	Cheeseweed	
Myrsinaceae - Myrsina Family		
* *Anagallis arvensis*	Scarlet Pimpernel	
Myrtaceae - Myrtle Family		
* *Eucalyptus sp.*	Gum	
Plantaginaceae - Plantain Family		
* *Plantago major*	Common Plantain	
Polygonaceae - Buckwheat Family		
Eriogonum fasciculatum var. fasciculatum	Coastal California Buckwheat	
Eriogonum giganteum var. giganteum	Santa Catalina Island Buckwheat	CRPR 4.3
* *Polygonum aviculare ssp. depressum*	Common Knotweed	
* *Rumex crispus*	Curly Dock	
Rumex salicifolius	Willow Dock	
Rosaceae - Rose Family		
* *Pyrus kawakanii*	Evergreen Pear	
Salicaceae - Willow Family		
Salix exigua	Narrow-Leaf Willow	
Salix laevigata	Red Willow	
Salix lasiolepis	Arroyo Willow	
Schrophulariaceae -Figwort Family		
* *Myoporum laetum*	Ngaio	
Solanaceae - Nightshade Family		
Datura wrightii	Western Jimpson Weed	
* *Lycopersicon esculentum*	Garden Tomato	
* *Nicotiana glauca*	Tree Tobacco	
* *Solanum nigrum*	Black Nightshade	
Tamaricaeae - Tamarisk Family		
* *Tamarix ramosissima*	Tamarisk	
Urticaceae - Nettle Family		
* *Urtica urens*	Dwarf Nettle	

Scientific Name	Common Name	Special Status

Legend

*= Non-native or invasive species

Special Status:

Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened
SR = Rare

CRPR – California Rare Plant Rank
1A. Presumed extinct in California
1B. Rare or Endangered in California and elsewhere
2. Rare or Endangered in California, more common elsewhere
3. Plants for which we need more information - Review list
4. Plants of limited distribution - Watch list

Threat Ranks
.1 - Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

Note that in March, 2010, CDFG changed the name of “CNPS List” or “CNPS Ranks” to “California Rare Plant Rank” (or CRPR). This was done to reduce confusion over the fact that CNPS and DFG jointly manage the Rare Plant Status Review groups that the rank assignments are the product of a collaborative effort and not solely a CNPS assignment.

Appendix B
Wildlife Species Detected in the Biological Study Area

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Appendix B. Wildlife Species Detected in the Biological Study Area

Scientific Name	Common Name	Special Status
INVERTEBRATES		
Branchiopods		
**Procambarus clarkii*	Red Swamp Crayfish	
VERTEBRATES		
Reptiles		
Sceloporus occidentalis	Western Fence Lizard	
Crotalus helleri	Southern Pacific Rattlesnake	
Birds		
Anas platyrhynchos	Mallard	
Podilymbus podiceps	Pied-billed Grebe	
Ardea herodias	Great Blue Heron	
Ardea alba	Great Egret	
Butorides virescens	Green Heron	
Nycticorax nycticorax	Black-crowned Night-Heron	
Elanus leucurus	White-tailed Kite	CFP
Circus cyaneus	Northern Harrier	SSC
Buteo jamaicensis	Red-tailed Hawk	
Falco sparverius	American Kestrel	
Rallus longirostris levipes	Light-footed Clapper Rail	FE, SE, CFP
Gallinula chloropus	Common Moorhen	
Fulica americana	American Coot	
Charadrius vociferus	Killdeer	
Zenaida macroura	Mourning Dove	
Calypte anna	Anna's Hummingbird	
Selasphorus sp.	Rufous/Allen's Hummingbird	
Picoides nuttallii	Nuttall's Woodpecker	
Empidonax difficilis	Pacific-slope Flycatcher	
Sayornis nigricans	Black Phoebe	
Tyrannus vociferans	Cassin's Kingbird	
Vireo bellii pusillus	Least Bell's Vireo	FE, SE
Aphelocoma californica	Western Scrub-Jay	
Corvus brachyrhynchos	American Crow	
Corvus corax	Common Raven	

Scientific Name	Common Name	Special Status
Stelgidopteryx serripennis	Northern Rough-winged Swallow	
Petrochelidon pyrrhonota	Cliff Swallow	
Hirundo rustica	Barn Swallow	
Psaltriparus minimus	Bushtit	
Thryomanes bewickii	Bewick's Wren	
Cistothorus palustris clarkae	Clark’s Marsh Wren	SSC
**Sturnus vulgaris*	European Starling	
Dendroica petechia	Yellow Warbler	SSC
Geothlypis trichas	Common Yellowthroat	
Icteria virens	Yellow-breasted Chat	SSC
Pipilo maculatus	Spotted Towhee	
Melozone crissalis	California Towhee	
Melospiza melodia	Song Sparrow	
Zonotrichia leucophrys	White-crowned Sparrow	
Agelaius phoeniceus	Red-winged Blackbird	
Euphagus cyanocephalus	Brewer's Blackbird	
Quiscalus mexicanus	Great-tailed Grackle	
**Molothrus ater*	Brown-headed Cowbird	
Icterus cucullatus	Hooded Oriole	
Carpodacus mexicanus	House Finch	
Carduelis psaltria	Lesser Goldfinch	
Carduelis tristis	American Goldfinch	
Mammals		
Eptesicus fuscus	Big Brown Bat	
Sylvilagus audubonii	Desert Cottontail	
Spermophilus beecheyi	California Ground Squirrel	
Thomomys bottae	Botta's Pocket Gopher	
Canis latrans	Coyote	
Lynx rufus	Bobcat	

Scientific Name	Common Name	Special Status

Legend

*= Non-native or invasive species

Special Status:

Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened
SSC = California Species of Special Concern
CFP = California Fully Protected Species

Appendix C
Regional Species and Habitats of Concern

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Appendix C

Regional Species and Habitats of Concern

This appendix addresses all habitats of concern and species with applicable special regulatory or management status whose general range includes the study area or whose habitat occurs within or near the study area and/or vicinity. A number of sources have been referenced, including those species listed under the Federal Endangered Species Act, the California Endangered Species Act, Species of Special Concern in California, species included in the City of San Diego Multiple Species Conservation Program, species listed by the City of San Diego as narrow endemic species and species listed by the US Fish and Wildlife Service (USFWS) on its Trust Resources List (TRL). The USFWS Trust Resources List is attached at the end of this appendix.

Information provided includes: 1) definitions of terms to describe likelihood of occurrence, 2) a table of special-status codes and their meanings, and 3) a species information table listing the English and scientific names, current special-status, likelihood of occurrence within the survey area, and specific notes relevant to likelihood of occurrence.

Conclusions provided in this report are limited to biology, and do not address regulatory or management issues. For interpretation of this information under applicable laws, regulations, and court precedent, see the relevant portion(s) of the report. Judgments regarding likelihood of occurrence are based on evaluation of available biological information regarding regional and local conditions, species biology, available evaluations of the study area and vicinity, and professional experience conducting field investigations across California over many years. Though professional, such judgments are necessarily subjective at least in part.

Specific factors substantially affect likelihood of occurrence for individual species on any particular study area. These factors are relevant at multiple scales, including regionally, locally, and within the study area. These factors include the presence or absence of other particular species (e.g., predators, prey), climate, ongoing disturbances, historical land use, and other past disturbances such as fire history, surface and subsurface hydrology, soil texture and chemistry, study area and habitat size and topology (i.e., shape and fragmentation), past population fluctuations of the species in response to random and nonrandom events, and many other factors, including many not readily visible. Note that some species, including some amphibians and many birds and bats, can occur in multiple roles. Thus, likelihood of occurrence, habitat use, and abundance may vary accordingly.

Finally, note that likelihood of occurrence for a given species refers to a time scale of a few years up to perhaps 10 years under current or assumed resources and conditions.

Terms for Potential to Occur in the Study Area

Confirmed Absent

If the potential for occurrence is *confirmed absent*, the species is confirmed to be absent on the study area as a formal and/or practical matter. Most often, this is a determination based on negative results of a focused survey for the species conducted in appropriate habitat at appropriate time(s) of year, using biologically sound methods and qualified personnel. In the remaining cases, it may be based on a simple study area examination, where it is easily determined that the species is absent because of the study area context. For example, a tidal marsh insect would not occur in a dry mountainside study area, or a disturbance-intolerant chaparral shrub would not occur in a long-standing, degraded grassland study area located far from chaparral. When a species is confirmed absent, the relevant fieldwork in all cases was conducted within a time frame sufficiently recent to conclude that the species remains absent, based on study area conditions and the species' known ecology. In most cases a specific, established survey protocol and/or guidelines have been followed.

Less than Reasonable

If the potential to occur is *less than reasonable*, the likelihood of occurrence, although remotely possible, is less than that required for any potentially applicable regulatory threshold. Further, the likelihood that the survey area is meaningfully valuable to any population(s) of this taxon is less than reasonable. The species may or may not include the study area within its current, general range. However, no appropriate, or adequately extensive, or effectively connected habitat is present. Neither the species nor any indication of its presence was detected. In some cases, based on the best available information, this likelihood may indicate that, the study area has a very high probability of being outside of the species' current range. In all of the above cases, the species may not be definitively ruled out but is strongly believed to be absent based on professional evaluation of all available evidence. In some cases, the species may occur on rare occasions and in low numbers, but with no more than brief, incidental use of the study area; that is, the survey area is also judged to lack any important function for the species. Certainly, there are no substantial populations directly utilizing the study area at any time of year. Further evaluation should not normally be required.

Low

If the potential to occur is *low*, occurrence of the species is reasonable but unlikely because of some combination of facts. For example, 1) the study area was the subject of unsuccessful searches conducted under relevant and reasonable circumstances, 2) potential habitat present is marginal or minimal in extent, 3) the best available information suggests the species is absent from the study area, and/or 4) available information sheds no clear light on the species likelihood on the study area, but it is known to be rare at best in the vicinity. Neither the species nor any indication of its presence was detected. Although individuals may have been missed, it is unlikely that substantial populations are present. Further evaluation should usually not be required for individual species except, in most cases, for biologically threatened or endangered species. Note however, that where several non-listed species hold this status, a higher likelihood of occurrence for "one or more" will generally hold. This is due both to the increased number of species and the fact that an array of possibilities often correlates with greater site biodiversity and lower relevant (but not readily detected) disturbance levels.

Moderate

If the potential to occur is *moderate*, the study area is within the range of the species, and contains potentially appropriate habitat. Neither individuals nor diagnostic sign were detected. It is nevertheless reasonable that some individuals may have been overlooked. The best available information on the species with regard to the study area is either very uncertain, or may be equally weighted for and against occurrence. Depending upon local and special legal status, extent of habitat, and the nature and sensitivity of the project, focused surveys for the species may be warranted or presence may be assumed.

High

If the potential to occur is *high*, the study area is known to be within the range of the species, and contains potential habitat with a high likelihood of occupancy. Although no individuals or diagnostic sign were detected during current fieldwork by a qualified observer, the species is likely to be present to some degree given the best available information. Depending upon regulatory status, local rarity, public interest, extent of habitat on the study area, and the nature of potential project impacts, a substantial basis may exist for either conducting focused surveys for the species or for assuming presence.

Confirmed Present

If the likelihood of occurrence is *confirmed present*, a qualified biologist or other reliable source has confirmed the presence of the species and there is no specific evidence that the species has subsequently become absent. Depending on the species and other information available, it may or may not be possible to determine, without further studies, what portions of the study area are currently in use.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
Plants					
Red sand-verbena (*Abronia maritima*)	CRPR 4.2	Perennial herb Coastal dunes; 0-100 m (0-328 ft). Blooming period: February to November	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April, May, and August rare plant surveys yielded no individuals observed.
San Diego thorn-mint (*Acanthomintha ilicifolia*)	FT SE CRPR 1B MSCP City NE UFWS TRL	Annual herb Prefers friable or broken clay soils in grassy openings in chaparral and coastal sage scrub, valley and foothill grassland, vernal pools; 10-960 m (33-3150 ft). Blooming period: April to June	HP	Low	Marginal habitat occurs survey area; however, areas of friable or broken clay soils do not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
California adolphia (*Adolphia californica*)	CRPR 2	Deciduous shrub Chaparral, coastal scrub, valley and foothill grassland; 45-740 m (148-2427 ft). Blooming period: December to May	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed. Furthermore, this shrub would have been easily identifiable year-round.
Shaw's agave (*Agave shawii*)	CRPR 2 MSCP City NE	Leaf succulent Coastal bluff scrub, coastal scrub; 10-75 m (32-246 ft). Blooming Period: September to May	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed. Furthermore, this succulent would have been easily identifiable year-round.
Desert fragrance (*Ambrosia monogyra*)	CRPR 2	Shrub Chaparral, Sonoran desert scrub, and riparian scrub; 10-500 m (33-1,640 ft). Blooming period: August to November	HP	Low	Suitable habitat occurs in the survey area. The August rare plant survey yielded no individuals observed. Furthermore, this shrub would have been easily identifiable year-round.
San Diego ambrosia (*Ambrosia pumila*)	FE CRPR 1B City NE USFWS TRL	Rhizomatous herb Chaparral, coastal sage scrub, valley and foothill grassland, vernal pools, often in disturbed areas. Can occur in creek beds, seasonally dry drainages, and floodplains; 20-415 m (66-1362 ft). Blooming period: April to October	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Aphanisma (*Aphanisma blitoides*)	CRPR 1B City NE	Annual herb Coastal bluff scrub, coastal dunes, sandy coastal scrub; 1-305 m (3-1000 ft). Blooming period: March to June	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*)	FE CRPR 1B MSCP USFWS TRL	Evergreen shrub Low- growing chaparral with eroding sandstone as substrate; 0-365 m (0-1197 ft). Blooming period: December to June	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed. Furthermore, this shrub would have been easily identifiable year-round.
Palmer's sagewort (*Artemisia palmeri*)	CRPR 4	Deciduous shrub Creeks and drainages, riparian scrub/forest/woodland, chaparral, coastal scrub; 15-915 m (50-3000 ft). Blooming period: May to September	P	Confirmed Present	Four individuals were detected in disturbed habitat in the survey area, northwest of the existing bridge.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
Western spleenwort (*Asplenium vespertinum*)	CRPR 4.2	Perennial rhizomatous herb Rocky areas in chaparral, cismontane woodland, and coastal scrub; 180-1000 m (590-3280 ft). Blooming period: February to June	HP	Low	Marginal habitat occurs in the survey area. The April and June rare plant surveys of the survey area yielded no individuals observed.
Coastal dunes milk-vetch (*Astragalus tener* var. *titi*)	FE SE CRPR 1B	Annual herb Coastal bluff scrub, coastal dunes, and coastal prairie; 1-50 (3-164 ft). Blooming period: March to May	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
Coulter's saltbush (*Atriplex coulteri*)	CRPR 1B	Perennial herb In San Diego, sea-bluff habitat is preferred by this rare species. Alkaline or clay soils in open sites, coastal dunes, coastal scrub, and grassland; 3-460 m (10-1509 ft). Blooming period: March to October	HP	Low	Marginal habitat occurs in the survey area. The April, May, and August rare plant surveys yielded no individuals observed.
South coast saltbush (*Atriplex pacifica*)	CRPR 1B	Annual herb Coastal bluff scrub, coastal dunes, coastal scrub, playas; 0-140 m (0-360 ft). Blooming period: March to October	HP	Low	Marginal habitat occurs in the survey area. The April, May, and August rare plant surveys yielded no individuals observed.
Davidson's saltbush (*Atriplex serenana* var. *davidsonii*)	CRPR 1B	Annual herb Coastal bluff scrub, alkaline coastal scrub; 10-200 m (33-656 ft). Blooming period: April to October	HP	Low	Marginal habitat occurs in the survey area. The April, May, and August rare plant surveys yielded no individuals observed.
Encinitas baccharis (*Baccharis vanessae*)	FT SE CRPR 1B MSCP City NE USFWS TRL	Deciduous shrub Coastal chaparral, central coast, foothills, cismontane woodland; 60–720 m (197-2362 ft). Blooming period: August to November	A	Less than reasonable	Suitable habitat does not occur in the survey area. Rare plant surveys yielded no individuals observed. Furthermore, this shrub would have been easily identifiable year-round.
San Diego sunflower (*Bahiopsis laciniata*) (=*Viguiera laciniata*)	CRPR 4.2	Perennial shrub Chaparral and coastal scrub; 60-750 m (197-2460 ft). Blooming period: February to August	P	Presence confirmed	Sixteen individuals and a 0.028-acre polygon were detected in disturbed Diegan coastal sage scrub in the southern portion of the survey area.
Nevin's barberry (*Berberis nevinii*)	FE CE CRPR 1B USFWS TRL	Perennial evergreen shrub Sandy or gravelly soils in chaparral, cismontane woodland, coastal scrub, and riparian scrub; 274-825 m (899-2,706 ft). Blooming period: March to June	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant yielded no individuals observed.
Golden-club cactus (*Bergerocactus emoryi*)	CRPR 2	Stem succulent Maritime succulent scrub; 3-394 m (10-1,295 ft). Blooming period: May to June	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed. Furthermore, this succulent would have been easily identifiable year-round.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
San Diego goldenstar (*Bloomeria clevelandii*) (=*Muilla clevelandii)*	CRPR 1B MSCP	Bulbiferous herb Chaparral, coastal sage scrub, valley grasslands, particularly near mima mound topography or the vicinity of vernal pools; 50 - 465 m (164-1526 ft). Blooming period : April to May	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Thread-leaf brodiaea (*Brodiaea filifolia*)	FT SE CRPR 1B	Bulbiferous herb Chaparral, coastal scrub, cismontane woodland, grasslands, playas, and vernal pools; 25-1219 m (82-3998 ft). Blooming period: March to June	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Orcutt's brodiaea (*Brodiaea orcuttii*)	CRPR 1B MSCP	Bulbiferous herb Moist grasslands, near streams and the periphery of vernal pools; 0-1600 m (0-5249 ft). Blooming period: May to July	A	Less than reasonable	Suitable habitat does not occur in the survey area. The May rare plant survey yielded no individuals observed.
Brewer's calandrinia (*Calandrinia breweri*)	CRPR 4.2	Annual herb Sandy or loamy soils in disturbed sites and burns, chaparral, and coastal scrub; 10-1220 m (33-4002 ft). Blooming period: March-June	HP	Low	Potentially suitable habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Lewis's evening-primrose (*Camissonia lewisii*)	CRPR 3	Annual herb Sandy substrates in coastal bluff scrub, cismontane woodland, costal dunes, and coastal scrub, and grasslands; 0-300 m (0-984 ft). Blooming period: March to May	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Lakeside ceanothus (*Ceanothus cyaneus*)	CRPR 1B	Evergreen shrub Closed-cone coniferous forest, dense chaparral; 235-755 m (771-2543 ft). Blooming period: April to June	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed. Furthermore, this shrub would have been easily identifiable year-round.
Wart-stem-lilac (*Ceanothus verrucosus*)	CRPR 2 MSCP	Evergreen shrub Chaparral; 1-380 m (3-1247 ft). Blooming period: December to May	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed. Furthermore, this shrub would have been easily identifiable year-round.
Southern tarplant (*Centromadia parryi* ssp. *australis*)	CRPR 1B	Annual herb Marshes and swamps, valley and foothill grassland, vernal pools; 0-427 m (0-1400 ft). Blooming period: May to November	HP	Low	Suitable habitat occurs in the survey area. The May and August rare plant surveys yielded no individuals observed.
Smooth tarplant (*Centromadia pungens* ssp. *laevis*)	CRPR 1B	Annual herb Chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grassland. 0-640 m (0-2099 ft). Blooming period: April to September	HP	Low	Suitable habitat occurs in the survey area. The May and August rare plant surveys yielded no individuals observed.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*)	CRPR 1B	Annual herb Coastal bluff scrub and coastal dunes; 3-100 m (10-328 ft). Blooming period: January to August	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April, May, and August rare plant surveys yielded no individuals observed.
Orcutt's spineflower (*Chorizanthe orcuttiana*)	FE SE CRPR 1B USFWS TRL	Annual herb Coastal chaparral openings in chamise, with loose sandy substrate, coastal scrub, closed-cone coniferous forest; 3-125 m (10-410 ft). Blooming period: March to May	HP	Low	Suitable habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Knotweed spineflower (*Chorizanthe polygonoides* var. *longispina*)	CRPR 1B	Annual herb Clay lenses, largely devoid of shrubs. Occasionally seen on the periphery of vernal pool habitat and the periphery of montane meadows near vernal seeps. Coastal scrub, chaparral, grasslands; 30-1530 m (98-5018 ft). Blooming period: April to June	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
Seaside cistanthe (*Cistanthe maritima*)	CRPR 4.2	Annual herb Sandy soils in coastal bluff scrub, coastal scrub, and valley and foothill grassland; 5-300 m (16-984 ft). Blooming period: February to August	HP	Low	Marginal habitat occurs in the survey area. The April, May and August rare plant surveys yielded no individuals observed.
Delicate clarkia (*Clarkia delicata*)	CRPR 1B	Annual herb Oak woodlands and chaparral; 235-1000 m (770-3280 ft). Blooming period: April to June	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April, May and August rare plant surveys yielded no individuals observed.
Summer holly (*Comarostaphylis diversifolia* var. *diversifolia*)	CRPR 1B	Evergreen shrub Southern mixed chaparral and cismontane woodland, usually on mesic north-facing slopes. Almost the entire population occurs west of Interstate 15; 30-550 m (98-1804 ft). Blooming period: April to June	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
Small-flowered morning-glory (*Convolvulus simulans*)	CRPR 4.2	Annual herb Clay soils and serpentine seeps in chaparral (openings), coastal scrub, and valley and foothill grassland; 30-700 m (98-2296 ft). Blooming period: March-July	HP	Low	Marginal habitat occurs in the survey area; however, areas of clay soils or serpentine seeps do not occur in the survey area. The May rare plant survey yielded no individuals observed.
San Diego sand aster (*Corethrogyne filaginifolia* var. *incana*)	CRPR 1B.1	Perennial herb Coastal bluff scrub, chaparral, coastal scrub; 3-115 m (10-377 ft). Blooming period: June-September	HP	Low	Marginal habitat occurs in the survey area. The August rare plant survey yielded no individuals observed.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
Del Mar mesa sand aster (*Corethrogyne filaginifolia* var. *linifolia*)	CRPR 1B.1	Perennial herb Sandy soils in coastal bluff scrub, openings in maritime chaparral, and coastal scrub; 15-150 m (49-492 ft). Blooming period: May to September	HP	Low	Marginal habitat occurs in the survey area. The May and August rare plant surveys yielded no individuals observed.
Snake cholla (*Cylindropuntia californica* var. *californica*)	CRPR 1B	Stem succulent Chaparral and coastal scrub; 30-150 m (98-492 ft). Blooming period: April to May	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed. Furthermore, this succulent would have been easily identifiable year-round.
Western dichondra (*Dichondra occidentalis*)	CRPR 4.2	Perennial rhizomatous herb Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland; 50-500 m (164-1640 ft). Blooming period: January to July	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Short-leaf dudleya (*Dudleya brevifolia*)	SE CRPR 1B MSCP	Perennial herb Openings in maritime chaparral and sandstone in coastal scrub; 30-250 m (98-820 ft). Blooming period: April	HP	Low	Marginal habitat occurs in the survey area; however, sandstone is not present. The April rare plant survey yielded no individuals observed.
Santa Rosa Island dudleya (*Dudleya blochmaniae* ssp. *insularis*)	CRPR 1B	Perennial herb Coastal bluff scrub; 3 m (10 ft). Blooming Period: March to April	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April rare plant survey yielded no individuals observed.
Variegated dudleya (*Dudleya variegata*)	CRPR 1B MSCP	Perennial herb Openings in chaparral, cismontane woodland, and coastal sage scrub, isolated rocky substrates in open grasslands, and vernal pools and mima mounds; 3-580 m (10-1902 ft). Blooming period: April to June	HP	Low	Marginal habitat occurs in the survey area. The April rare plant survey yielded no individuals observed.
Sticky dudleya (*Dudleya viscida*)	CRPR 1B	Perennial herb Coastal bluff scrub, chaparral, cismontane woodland and rocky coastal scrub; 10-550 m (32-1804 ft). May to June	HP	Low	Marginal habitat occurs in the survey area. The May rare plant survey yielded no individuals observed.
Palmer's goldenbush (*Ericameria palmeri ssp. palmeri*)	CRPR 2	Evergreen shrub Coastal drainages, in mesic chaparral sites, or rarely in coastal sage scrub; below 600 m (1969 ft). Blooming period: August to October (uncommon in July)	HP	Low	Marginal habitat occurs in the survey area. The August rare plant survey yielded no individuals observed. Furthermore, this shrub would have been easily identifiable year-round.
Hoover's button-celery (*Eryngium aristulatum* var. *hooveri*)	CRPR 1B MSCP	Annual/Perennial herb Vernal pools; 3-45 m (10-148 ft). Blooming Period: July	A	Less than reasonable	Suitable habitat does not occur in the survey area.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
San Diego button-celery (*Eryngium aristulatum* var. *parishii*)	FE SE CRPR 1B City NE USFWS TRL	Annual/Perennial herb Vernal pools or mima mound areas with vernally moist conditions, coastal sage scrub, valley and foothill grassland; 20-620 m (66-2033 ft). Blooming period: April to June	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Coast wallflower (*Erysimum ammophilum*)	CRPR 1B	Perennial herb Maritime chaparral, coastal dunes, sandy openings in coastal scrub; 0-60 (0-197 ft). Blooming period: February to June	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
CliffsSpurge (*Euphorbia misera*)	CRPR 2	Shrub Coastal bluff scrub, coastal scrub, rocky Mojave desert scrub; 10-500 m (32-1640 ft). Blooming period: December August	HP	Low	Marginal habitat occurs in the survey area. The April, May, and August rare plant surveys yielded no individuals observed. Furthermore, this shrub would have been easily identifiable year-round.
San Diego barrel cactus (*Ferocactus viridescens*)	CRPR 2 MSCP	Stem succulent Sandy to rocky areas; 10-150 m (33-492 ft). Blooming period: May to June	HP	Low	Marginal habitat occurs in the survey area. The May rare plant survey yielded no individuals observed. Furthermore, this succulent would have been easily identifiable year-round.
Palmer's frankenia (*Frankenia palmeri*)	CRPR 2	Perennial herb Coastal dunes, coastal salt marsh and swamps, playas; 0-10 m (0-32 ft). Blooming period: May to July	HP	Low	Marginal habitat occurs in the survey area. The May rare plant survey yielded no individuals observed.
Campbell's liverwort (*Geothallus tuberosus*)	CRPR 1B	Ephemeral liverwort Mesic coastal scrub, and vernal pools; 10-600 m (32-1968 ft). Blooming Period: Not applicable	HP	Low	Marginal habitat occurs in the survey area. Rare plant surveys of the survey area yielded no individuals observed.
Mission Canyon bluecup (*Githopsis diffusa* ssp. *filicaulis*)	CRPR 3	Annual herb Mesic or disturbed areas in chaparral; 450-700 m (1476-2296 ft). Blooming Period: April to June	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
San Diego gumplant (*Grindelia hallii*)	CRPR 1B	Perennial herb Chaparral, lower montane coniferous forest, meadows and seeps, grassland; 185-1745 m (606-5724 ft). Blooming Period: July to October	A	Less than reasonable	Suitable habitat does not occur in the survey area. The August rare plant survey yielded no individuals observed.
Palmer's grappling-hook (*Harpagonella palmeri*)	CRPR 4	Annual herb Clay vertisols with open grassy slopes or Diegan coastal sage scrub between 20-955 m (66 to 3132 ft). Blooming period: March to May	HP	Low	Marginal habitat occurs in the survey area; however, suitable clay vertisols are not present. The April and May rare plant surveys yielded no individuals observed.
Orcutt's goldenbush (*Hazardia orcuttii*)	FC ST CRPR 1B	Evergreen shrub Maritime chaparral, coastal scrub, often in clay; 80-85 m (262-279 ft). Blooming period: August to October	HP	Low	Marginal habitat occurs in the survey area. The August rare plant survey yielded no individuals observed. Furthermore, this shrub would have been easily identifiable year-round.

Common Name (*Scientific Name*)	**Sensitivity Code & Status**	**Habitat Preference/ Requirements**	**Habitat Present/ Absent**	**Potential to Occur**	**Rationale**
False goldenaster (*Heterotheca sessiliflora* ssp. *sessiliflora*)	CRPR 1B	Perennial herb Coastal chaparral, coastal dunes, coastal scrub; 0-1225 m (0-4018 ft). Blooming period: March to December	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Graceful tarplant (*Holocarpha virgata* ssp. *elongata*)	CRPR 4.2	Annual herb Chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland; 60-1100 m (197-3608 ft). Blooming period: May to November	HP	Low	Marginal habitat occurs in the survey area. The May and August rare plant surveys yielded no individuals observed.
Decumbent goldenbush *(Isocoma menziesii var. decumbens*)	CRPR 1B	Shrub Sandy areas in coastal sage scrub habitat intermixed with grassland, and chaparral; 10-135 m (33-443 ft) Blooming period: April to November	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed. Furthermore, this shrub would have been easily identifiable year-round.
San Diego marsh-elder (*Iva hayesiana*)	CRPR 2	Perennial herb Marshes and swamps, playas, creeks or intermittent streambeds; below 500 m (1640 ft). Blooming period: April to October	P	Presence confirmed	Six individuals were detected in disturbed southern willow scrub and tamarisk scrub in the survey area.
Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*)	CRPR 4	Rhizomatous herb Coastal dunes, meadows and seeps, coastal marshes and swamps; 3-900 m (10-2952 ft). Blooming period: May to June	P	Presence confirmed	Forty-two individuals were detected in coastal freshwater marsh, mule-fat scrub, and tamarisk scrub in the survey area.
Coulter's salt-marsh daisy (*Lasthenia glabrata* ssp. *coulteri*)	CRPR 1B	Annual herb Tidal marsh, swamps, playas, or the periphery of vernal pools; 1-1220 m (3-4,000 ft. Blooming period: February to June	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)	CRPR 1B	Annual herb Openings in chaparral and sage scrub, generally well away from the coast in Southern California in the foothill elevations; below 500 m (1640 ft). Blooming Period: January to July	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Sea dahlia (*Leptosyne maritima*)	CRPR 2.2	Perennial herb Coastal bluff scrub and coastal scrub; 5-150 m (16-492 ft). Blooming Period: March to May	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Nuttall's lotus (*Lotus nuttallianus*)	CRPR 1B	Annual herb Coastal dunes and sandy coastal scrub; 0-10 m (0-32 ft). Blooming Period: March to June	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
Small-flowered microseris (*Microseris douglasii* ssp. *platycarpha*)	CRPR 4.2	Annual herb Clay soils in cismontane woodland, coastal scrub, valley and foothill grassland, and vernal pools; 15-1070 m (49-3509 ft). Blooming Period: March to May	HP	Low	Marginal habitat occurs in the survey area; however, clay soils are not present. The April and May rare plant surveys yielded no individuals observed.
Low bush monkeyflower (*Mimulus aurantiacus* var. *aridus*)	CRPR 4.3	Perennial evergreen shrub Chaparral (rocky) and Sonoran desert scrub; 750-1200 m (2460-3936 ft). Blooming Period: April to July	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
Palomar monkeyflower (*Mimulus diffusus*)	CRPR 4.3	Annual herb Sandy or gravelly soils in chaparral and lower montane coniferous forest; 1220-1830 m (4000-6000 ft). Blooming Period: April to June	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
Felt-leaved monardella (*Monardella hypoleuca* var*. lanata*)	CRPR 1B	Rhizomatous herb Chaparral understory; 300-1000 m (984-3280 ft). Blooming Period: June to August	A	Less than reasonable	Suitable habitat does not occur in the survey area. The August rare plant survey yielded no individuals observed.
Willowy monardella (*Monardella viminea*)	FE SE CRPR 1B MSCP USFWS TRL	Perennial herb Riparian scrub/forest, usually at sandy locales in seasonally dry washes. Below 400 m (1312 ft). Blooming Period: June to August	HP	Low	Marginal habitat occurs in the survey area. The August rare plant survey yielded no individuals observed.
Little mousetail (*Myosurus minimus ssp. apus*)	CRPR 3	Annual herb Vernal pools; below 640 m (2100 ft). Blooming Period: March to June	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
Spreading navarretia (*Navarretia fossalis*)	CRPR 1B City NE USFWS TRL	Annual herb Vernal pools and vernal swales; 30-1300 m (98-4265 ft). Blooming Period: April to June	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
Flat navarretia (*Navarretia prostrata*)	CRPR 1B	Annual herb Coastal scrub, meadows and seeps, alkaline grassland, vernal pools; 15-700. m (49-2296 ft) Blooming Period: April to July	HP	Low	Marginal habitat occurs in the survey area. The April and May rare plant surveys yielded no individuals observed.
Coast woolly-heads (*Nemacaulis denudata* var. *denudata*)	CRPR 1B	Annual herb Coastal dunes; 0-100 m (0-328 ft). Blooming Period: April to September	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April, May, and August rare plant surveys yielded no individuals observed.
California Orcutt grass (*Orcuttia californica*)	FE SE CRPR 1B City NE USFWS TRL	Annual herb Vernal pools; 15-660 m (49-2165 ft). Blooming period: April to August	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April, May, and August rare plant surveys yielded no individuals observed.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
Short-lobe broom-rape (*Orobanche parishii* ssp. *brachyloba*)	CRPR 4	Parasitic perennial herb Costal bluff scrub, coastal dunes, sandy coastal scrub; 3-305 m (10-1000 ft). Blooming period: April to October	HP	Low	Marginal habitat occurs in the survey area. The April, May, and August rare plant surveys yielded no individuals observed.
South coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis*)	CRPR 4.2	Perennial herb Sandy, sometimes rocky soils in chaparral, coastal dunes, coastal scrub, and coastal salt marshes and swamps; 6-300 m (20-984 ft). Blooming period: March to August	HP	Low	Marginal habitat occurs in the survey area. April, May and August rare plant surveys yielded no individuals observed.
Brand's phacelia (*Phacelia stellaris*)	FC CRPR 1B	Annual herb Coastal dunes and coastal scrub; 1-400 m (3-1312 ft). Blooming period: March to June	HP	Low	Marginal habitat occurs in the survey area. April and May rare plant surveys yielded no individuals observed.
Torrey pine (*Pinus torreyana* ssp. *torreyana*)	CRPR 1B MSCP	Evergreen tree Closed-cone coniferous forest and sandstone chaparral; 75-160 m (246-525 ft). Blooming period: Not applicable	A	Less than reasonable	Suitable habitat does not occur in the survey area. The rare plant surveys yielded no individuals observed. Furthermore, this tree species would have been easily identifiable year-round.
Cooper's rein orchind (*Piperia cooperi*)	CRPR 4.2	Perennial herb Chaparral, cismontane woodland, and valley and foothill grassland; 15-1585 m (ft). Blooming period: March to June	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
San Diego mesa mint (*Pogogyne abramsii*)	FE SE CRPR 1B MSCP City NE USFWS TRL	Annual herb Vernal pools; 90-200 m (295-656 ft). Blooming period: March to July	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
Otay mesa mint (*Pogogyne nudiuscula*)	FE SE CRPR 1B City NE	Annual herb Vernal pools; 90-250 m (295-820 ft). Blooming period: May to July	A	Less than reasonable	Suitable habitat does not occur in the survey area. The April and May rare plant surveys yielded no individuals observed.
Nuttall's scrub oak (*Quercus dumosa*)	CRPR 1B	Evergreen shrub Coastal chaparral, sandy or clayey coastal scrub, closed-cone coniferous forest; 15-400 m (49-1312 ft). Blooming period: February to April	HP	Low	Marginal habitat occurs in the survey area. The April rare plant survey yielded no individuals observed. Furthermore, this shrub species would have been easily identifiable year-round.
Engelmann's oak (*Quercus engelmannii*)	CRPR 4.2	Perennial deciduous tree Chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland; 50-1300 m (164-4264 ft). Blooming period: March to June	HP	Low	Marginal habitat occurs in the survey area. The rare plant surveys yielded no individuals observed. Furthermore, this tree species would have been easily identifiable year-round.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
California groundsel (*Senecio aphanactis*)	CRPR 2	Annual herb Dry alkaline flats, chaparral, cismontane woodlands and coastal sage scrub; 15-800 m (49-2,624 ft). Blooming period: January to April	HP	Low	Marginal habitat occurs in the survey area. The April rare plant survey yielded no individuals observed.
Purple stemodia (*Stemodia durantifolia*)	CRPR 2	Perennial herb Sandy dry canyon bottoms or drainage and mesic Sonoran desert scrub; 180-300 m (590-984 ft). Blooming period: January to December	A	Less than reasonable	Suitable habitat does not occur in the survey area. The rare plant surveys yielded no individuals observed.
Oil neststraw (*Stylocline citroleum*)	CRPR 1B	Annual herb In the vicinity of oil fields, chenopod scrub, coastal scrub, grasslands; 50-400 m (164-1312 ft). Blooming period: March to April	HP	Low	Marginal habitat occurs in the survey area. The April rare plant survey yielded no individuals observed.
Estuary sea-blite (*Suaeda esteroa*)	CRPR 1B	Perennial herb Coastal salt marsh and swamps; 0-5 m (0-16 ft). Blooming period: May to October	HP	Low	Marginal habitat occurs in the survey area. The May and August rare plant surveys yielded no individuals observed.
Rush-like bristleweed (*Xanthisma junceum*)	CRPR 4.3	Perennial herb Chaparral and coastal scrub; 240-1000 m (787-3280 ft). Blooming period: June to January	HP	Low	Marginal habitat occurs in the survey area. The August rare plant survey yielded no individuals observed.
Wildlife					
Bell's sparrow (*Amphispiza belli*)	USFWS TRL	Coastal sage scrub and mixed chaparral	HP	Low	Marginal habitat occurs in the project area. Coastal sage scrub occurs as narrow, isolated strips or as disturbed *Baccharis*-dominated patches.
Burrowing owl (*Athene cunicularia*)	USFWS TRL	Grasslands, rangelands, agricultural areas, deserts, or any other open dry area with low vegetation	HP	Low	Marginal habitat occurs in the roject area. Non-native grassland occurs as a small patch approximately 500 ft west of the project. Exisitng vegetation is dense and of a disturbed nature.
San Diego fairy shrimp (*Branchinecta sandiegoensis*)	FE MSCP USFWS TRL	Vernal pools. All known localities are below 701m (2,300 ft) and are within 64km (40 miles) of the Pacific Ocean.	A	Less than reasonable	Vernal pools do not occur in the survey area.
Mountain plover (*Charadrius montanus*)	USFWS TRL	Shortgarss prairies, high table lands.	A	Less than reasonable	Shortgrass prarie and high tableslands do not occur in the survey area.
Costa's hummingbird (*Calypte costae*)	USFWS TRL	Arid, brushy deserts of the southwestern U.S.	A	Less than reasonable	Brushy desert habitat does not occur in the survey area.
Cactus wren (*Campylorhynchus brunneicapillus*)	USFWS TRL	Various cactus species in southwestern U.S. deserts. Can occur in urban settings.	A	Low	Cactus species lacking from the project area. Can occur in urban settings.

Common Name (*Scientific Name*)	**Sensitivity Code & Status**	**Habitat Preference/ Requirements**	**Habitat Present/ Absent**	**Potential to Occur**	**Rationale**
Lawrence's goldfinch (*Carduelis lawrencei*)	USFWS TRL	Woodlands of southern california and Baja.	HP	Low	Although woodland habitat occurs in the project area, this species is known to breed in only a few areas within its range.
Quino Checkerspot Butterfly (*Euphydryas editha quino*)	FE	Typically found in vegetated hilltops, ridgelines, and occasionally rocky outcrops surrounded by open-canopied habitats, including openings on clay soils in or near shrublands, grasslands, meadows, vernal pools, and lake margins. Habitats must have open areas with low growing and sparse vegetation. Closely tied to its larval host plants, including dot-seed plantain (*Plantago erecta*) or owl's clover (*Castilleja exserta*).	A	Less than reasonable	Suitable habitat does not occur in the survey area. Coastal sage scrub occurs as isolated, narrow strips of vegetation adjacent to high-traffic roads.
Riverside Fairy Shrimp (*Streptocephalus woottoni*)	FE MSCP USFWS TRL	Vernal pools.	A	Less than reasonable	Vernal pools do not occur in the survey area.
Western snowy plover (*Charadrius alexandrines nivosus*)	FT (Nesting) SSC MSCP USFWS TRL	Nests on beaches dunes and salt flats. Forages on sandy beaches with kelp washed ashore and in areas with little or no human activity and avoid areas of high human use.	A	Breeding – Less than reasonable Migration/Wintering - Low	The survey area does not support suitable breeding conditions for this species whose nesting distribution has been studied in depth (Unitt 2004); however, this species is more widespread during winter.
Northern harrier (*Circus cyaneus*)	SSC (nesting) MSCP	Grasslands and marshes. Nests are on the ground and typically concealed within a marsh or other dense vegetation.	P	Confirmed present	This species was detected in disturbed habitat outside of the survey area.
Clark's marsh wren (*Cistothorus palustris clarkae*)	SSC	Freshwater and brackish marshes.	P	Confirmed present	This species was detected in coastal freshwater marsh in the survey area.
Yellow warbler (*Dendroica petechia*)	SSC USFWS TRL	Riparian woodlands.	P	Confirmed present	This species was detected in disturbed southern willow scrub in the survey area.
White-tailed kite (*Elanus leucurus*)	CFP (nesting)	Open grasslands, agricultural areas, wetlands, and oak woodlands. Their primary source of food is the California vole. It typically forages in open undisturbed habitats and nests in the top of a dense oak, willow or other large tree.	P	Confirmed present	This species was detected in disturbed habitat outside of the survey area.
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	FE SE	Willow thickets and riparian woodlands	A	Less than reasonable	Suitable habitat does not occur in the survey area. Riparian scrub is degraded, lacks suitable structure, and does not support mature trees.
Black oystercatcher (*Haematopus bachmani*)	USFWS TRL	Rocky shores of the Pacific coast from baja to Alaska.	A	Less than reasonable	Appropriate habita does not occur in the project area.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
Bald eagle (*Haliaeetus leucocephalus)*	USFWS TRL	Near large bodies of open water with an abundant food supply and old-growth trees for nesting.	A	low	Apropriate habitat occurs at the pacific Ocean approximately 5 miles to the west of the project. May occur as a transient.
Yellow-breasted chat (*Icteria virens*)	SSC	Dense stands of riparian woodland.	P	Confirmed present	This species was detected in disturbed southern willow scrub in the survey area.
Least bittern (*Ixobrychus exilis*)	USFWS TRL	Freshwater marshes.	P	moderate	Secretive species that may have been overlooked during field surveys.
Black rail (*Laterallus jamaicensis*)	ST	Coastal wetlands.	A	Less than reasonable	Suitable habitat does not occur in the survey area. Furthermore, The species has been extirpated from San Diego County since 1983 (Unitt 2004).
Short-billed dowitcher (*Limnodromus griseus*)	USFWS TRL	Breeds in northern bogs; frequents marshy ponds, lake and river shores, and mudflats during migration.	P	low	Little appropriate habiat occursin the project area; however, some marshy ponds do exist.
Marbled godwit (*Limosa fedoa)*	USFWS TRL	Mudflats, salt marshes and beaches.	A	Less than reasonable	Appropritae habitat lacking in the project area.
Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*)	SE MSCP	Coastal marshes dominated by pickleweed (*Arthrocnemum subterminale*, *Sarcocornia*, and *Salicornia*).	HP	Low	Marginal habitat d occurs in the survey area. Coastal salt marsh is disturbed and does not support appropriate vegetative structure.
Green-tailed towhee (*Pipilo chlorurus*)	USFWS TRL	Mountainous shrublands and sagebrush expanses.	A	Less than reasonable	Appropritae habitat lacking in the project area.
Coastal California gnatcatcher (*Polioptila californica californica*)	FT SSC MSCP USFWS TRL	Prefer open scrubby habitats such as coastal sage scrub and some forms of chaparral.	HP	Low	Marginal habitat occurs in the survey area. Coastal sage scrub occurs as isolated, narrow strips of vegetation adjacent to high-traffic roads.
Light-footed clapper rail (*Rallus longirostris levipes*)	FE SE SFP MSCP USFWS TRL	Coastal salt marshes.	P	Confirmed present	This species was detected in the survey area during focused surveys in 2001, 2004, and 2006, and incidentally during a reconnaissance survey in 2009.
Black skimmer (*Rynchops niger*)	USFWS TRL	River mouths, lagoons and estuaries	A	low	Occurs in south San Diego Bay but rarely furhter north than the sweetwater River (Unitt 1983)
Black-chinned sparrow (*Spizella atrogularis)*	USFWS TRL	Chaparral in the foothills and mounatins	A	Less than reasonable	Appropritae habitat lacking in the project area.
Brewer's sparrow (*Spizella breweri*)	USFWS TRL	Common in desert chaparral in winter, uncommon in coastal lowlands (Unitt 1983)	HP	low	Uncommon in coastal lowlands (Unitt 1983)

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
California least tern (*Sternula antillarum browni)*	FE (nesting colony) SE (nesting colony) MSCP USFWS TRL	Nests in colonies on sandy beaches with sparse vegetation. Forages in shallow ocean water, generally less than 60 feet deep and within one mile of shore, and in wetlands near nesting locales.	A	Breeding and migration – Less than reasonable	The survey area does not support suitable breeding habitat for this species whose nesting distribution has been studied in depth (Unitt 2004). This species winters in South America.
Lesser yellowlegs (*Tringa flavipes*)	USFWS TRL	Brackish lagoon, freshwater marshes, coastal salt marshes, mudflats.	P	Reasonable	Appropriate habitat occurs in the project vicinity.
Least Bell's vireo (*Vireo bellii pusillus*)	FE SE MSCP USFWS TRL	Riparian thickets either near water or in dry portions of river bottoms; nests along margins of bushes and forages low to the ground; may also be found using mesquite and arrow weed in desert canyons.	P	Confirmed present	This species was detected adjacent to the survey area during a habitat assessment in 2011 and in 2004. This species was not detected during focused surveys conducted in 2002 and 2009.
Pacific pocket mouse *(Perognathus longimembris pacificus*)	FE SSC USFWS TRL	Obligate resident of river and marine alluvium and coastal sage scrub plant communities in the immediate vicinity of the coast.	HP	Less than reasonable	Suitable habitat does not occur in the survey area. Coastal sage scrub occurs as isolated, narrow strips of vegetation adjacent to high-traffic roads. A habitat assessment conducted by USFWS in 1999 determined that the site does not support suitable habitat.
Vegetation Communities					
Maritime succulent scrub	CNDDB	NA	A		This vegetation community is not present in the survey area.
San Diego mesa hardpan vernal pool	CNDDB	NA	A		This vegetation community is not present in the survey area.
Southern coast live oak riparian forest	CNDDB	NA	A		This vegetation community is not present in the survey area.
Southern coastal salt marsh	CNDDB	NA	P		Disturbed southern coastal salt marsh is present in the survey area.
Southern cottonwood willow riparian forest	CNDDB	NA	A		This vegetation community is not present in the survey area.
Southern maritime chaparral	CNDDB	NA	A		This vegetation community is not present in the survey area.
Southern riparian forest	CNDDB	NA	A		This vegetation community is not present in the survey area.
Southern riparian scrub	CNDDB	NA	A		This vegetation community is not present in the survey area.
Southern sycamore alder riparian woodland	CNDDB	NA	A		This vegetation community is not present in the survey area.
Southern willow scrub	CNDDB	NA	P		Disturbed southern willow scrub is present in the survey area.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
Torrey pine forest	CNDDB	NA	A		This vegetation community is not present in the survey area.
Valley needlegrass grassland	CNDDB	NA	A		This vegetation community is not present in the survey area.

Legend:

Status:
Federal
FE – listed as endangered under the federal Endangered Species Act.
FT – listed as threatened under the federal Endangered Species Act.
FC – a candidate for state or federal listing as Endangered, Threatened, or Rare
State
SE – listed as endangered under the California Endangered Species Act.
ST – listed as threatened under California Endangered Species Act.
SR – listed as rare under California Endangered Species Act.
SFP – California Department of Fish & Game - Fully Protected
SSC - species of special concern in California.

CRPR – California Rare Plant Rank
1B – Rare, threatened or endangered in California and elsewhere
2 – Rare, threatened or endangered in California but more common elsewhere
3 – May be rare but more research needed to determine true status
4 – Limited distribution and are uncommon but not presently rare or endangered

MSCP – Species covered in the Northern Area of the MSCP

City NE – City of San Diego Narrow Endemic Species

USFWS TRL – U.S. Fish and Wildlife Service Trust Resources List. Unofficial listing of species of concern that may occur in the project area.

Habitat Present/Absent:
Absent [A] - no habitat present and no further work needed.
Habitat Present [HP] -habitat is, or may be present. The species may be present.
Present [P] - the species is present.
Critical Habitat [CH] - project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is present.

Special Note
It is important to note the CDFG revised their list of bird species of special concern in 2008 (CDFG 2008, Schuford and Gardali 2008). Several species of birds that would previously have been addressed in this table no longer have special-status. If the species is a MSCP covered species, its occurrence on site is still addressed in the table.

References for plants and vegetation communities:
Special Status information from CDFG 2011. Nomenclature and plant descriptions from Abrams 1923 and 1944, Abrams and Ferris 1960, Beauchamp 1986, CNPS Online Inventory, Hickman 1993, McAuley 1996, Munz 1974, Reiser 1994, Roberts 1989, Skinner and Pavlik 1994.
References for wildlife:
Special Status information from CDFG 2008. Nomenclature and invertebrate descriptions from Hogan 2005, and USFWS 1997. Nomenclature and vertebrate descriptions from AOU

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/ Requirements	Habitat Present/ Absent	Potential to Occur	Rationale
1998 and supplements (AOU 2000, 2002, 2003, 2004, 2005, 2006), CDFG 2005, Collins and Taggart 2002, Schuford and Gardali 2008, Stephenson and Calcarone 1999, Baker *et al.* 2003, and Unitt 2004.					

U.S. Fish and Wildlife Service

Trust Resources List

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

Carlsbad Fish and Wildlife Office
2177 SALK AVENUE - SUITE 250
CARLSBAD, CA 92008
(760) 431-9440
http://www.fws.gov/carlsbad/

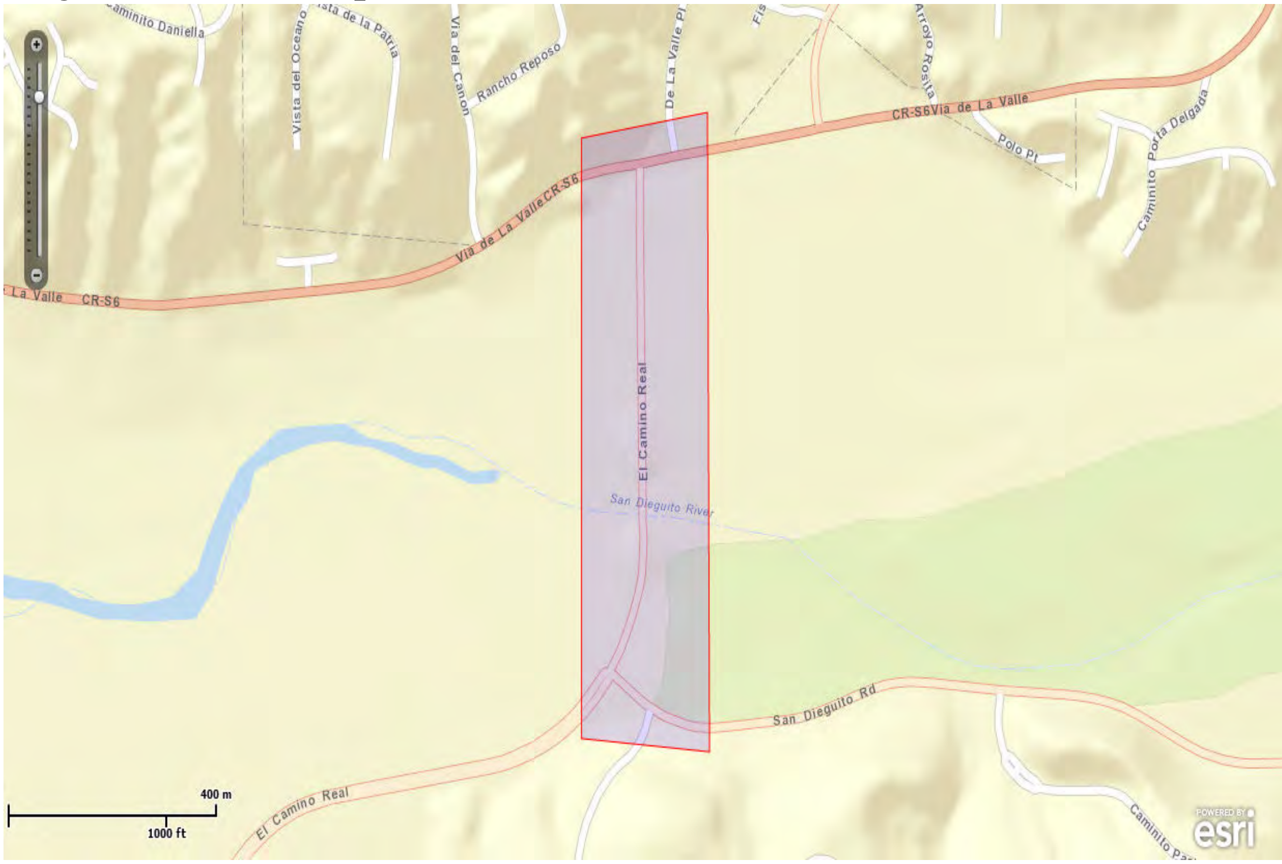
Project Name:

El Camino Real Bridge Replacement

U.S. Fish and Wildlife Service

Trust Resources List

Project Location Map:



Project Location Measurements:

Area : 58.0 ac.

Length : 1.5 mi.

Project Counties:

San Diego, CA

Geographic coordinates (Open Geospatial Consortium Well-Known Text, NAD83):

MULTIPOLYGON (((-117.2316878 32.9830618, -117.22907 32.9834199, -117.229027 32.9745998, -117.2316878 32.9747817, -117.2316878 32.9830618)))

U.S. Fish and Wildlife Service

Trust Resources List

Project Type:

Transportation

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of **19** threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

Species that should be considered in an effects analysis for your project:

Birds	Status		Has Critical Habitat	Contact
California Least tern (*Sterna antillarum browni*)	Endangered	species info		Carlsbad Fish And Wildlife Office
Coastal California gnatcatcher (*Polioptila californica californica*) Population: Entire	Threatened	species info	Final designated critical habitat	Carlsbad Fish And Wildlife Office
Least Bell's vireo (*Vireo bellii pusillus*) Population: Entire	Endangered	species info	Final designated critical habitat	Carlsbad Fish And Wildlife Office
Light-Footed Clapper rail (*Rallus longirostris levipes*) Population: U.S.A. only	Endangered	species info		Carlsbad Fish And Wildlife Office
western snowy plover (*Charadrius nivosus ssp. nivosus*) Population: Pacific coastal pop.	Threatened	species info	Final designated critical habitat	Carlsbad Fish And Wildlife Office
Crustaceans				
Riverside fairy shrimp (*Streptocephalus woottoni*) Population: Entire	Endangered	species info	Final designated critical habitat	Carlsbad Fish And Wildlife Office
San Diego fairy shrimp (*Branchinecta sandiegonensis*)	Endangered	species info	Final designated critical habitat	Carlsbad Fish And Wildlife Office
Flowering Plants				

California Orcutt grass (*Orcuttia californica*)	Endangered	species info		Carlsbad Fish And Wildlife Office
Del Mar manzanita (*Arctostaphylos glandulosa ssp. crassifolia*)	Endangered	species info		Carlsbad Fish And Wildlife Office
Encinitas baccharis (*Baccharis vanessae*)	Threatened	species info		Carlsbad Fish And Wildlife Office
Nevin's barberry (*Berberis nevinii*)	Endangered	species info	Final designated critical habitat	Carlsbad Fish And Wildlife Office
Orcutt's spineflower (*Chorizanthe orcuttiana*)	Endangered	species info		Carlsbad Fish And Wildlife Office
San Diego ambrosia (*Ambrosia pumila*)	Endangered	species info	Final designated critical habitat	Carlsbad Fish And Wildlife Office
San Diego button-celery (*Eryngium aristulatum var. parishii*)	Endangered	species info		Carlsbad Fish And Wildlife Office
San Diego mesa-mint (*Pogogyne abramsii*)	Endangered	species info		Carlsbad Fish And Wildlife Office
San Diego thornmint (*Acanthomintha ilicifolia*)	Threatened	species info	Final designated critical habitat	Carlsbad Fish And Wildlife Office
Spreading navarretia (*Navarretia fossalis*)	Threatened	species info	Final designated critical habitat	Carlsbad Fish And Wildlife Office
Willowy monardella (*Monardella viminea*)	Endangered	species info	Final designated critical habitat	Carlsbad Fish And Wildlife Office
Mammals				
Pacific Pocket mouse (*Perognathus longimembris pacificus*) Population: Entire	Endangered	species info		Carlsbad Fish And Wildlife Office

Critical habitats within your project area:

There are no critical habitats within your project area.

Trust Resources List

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program).

There are no refuges found within the vicinity of your project.

FWS Migratory Birds (USFWS Migratory Bird Program).

The protection of birds is regulated by the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. For more information regarding these Acts see http://www.fws.gov/migratorybirds/RegulationsandPolicies.html.

All project proponents are responsible for complying with the appropriate regulations protecting birds when planning and developing a project. To meet these conservation obligations, proponents should identify potential or existing project-related impacts to migratory birds and their habitat and develop and implement conservation measures that avoid, minimize, or compensate for these impacts. The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

For information about Birds of Conservation Concern, go to
http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BCC.html.

Migratory birds of concern that may be affected by your project:

There are **17** birds on your Migratory birds of concern list. The Division of Migratory Bird Management is in the process of populating migratory bird data with an estimated completion time of Fall 2014; therefore, the list below may not include all the migratory birds of concern in your project area at this time. While this information is being populated, please contact the Field Office for information about migratory birds in your project area.

Species Name	Bird of Conservation Concern (BCC)	Species Profile	Seasonal Occurrence in Project Area
Bald eagle (*Haliaeetus leucocephalus*)	Yes	species info	Wintering
Bell's Sparrow (*Amphispiza belli*)	Yes	species info	Year-round
Black Oystercatcher (*Haematopus bachmani*)	Yes	species info	Year-round

Black Skimmer (*Rynchops niger*)	Yes	species info	Year-round
Black-chinned Sparrow (*Spizella atrogularis*)	Yes	species info	Breeding
Brewer's Sparrow (*Spizella breweri*)	Yes	species info	Year-round
Burrowing Owl (*Athene cunicularia*)	Yes	species info	Year-round
Cactus Wren (*Campylorhynchus brunneicapillus*)	Yes	species info	Year-round
Costa's Hummingbird (*Calypte costae*)	Yes	species info	Breeding
Green-tailed Towhee (*Pipilo chlorurus*)	Yes	species info	Breeding
Lawrence's Goldfinch (*Carduelis lawrencei*)	Yes	species info	Year-round
Least Bittern (*Ixobrychus exilis*)	Yes	species info	Year-round
Lesser Yellowlegs (*Tringa flavipes*)	Yes	species info	Wintering
Marbled Godwit (*Limosa fedoa*)	Yes	species info	Wintering
Mountain plover (*Charadrius montanus*)	Yes	species info	Wintering
Short-billed Dowitcher (*Limnodromus griseus*)	Yes	species info	Wintering
Yellow warbler (*dendroica petechia ssp. brewsteri*)	Yes	species info	Breeding

NWI Wetlands (USFWS National Wetlands Inventory).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

Data Limitations, Exclusions and Precautions

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery and/or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Exclusions - Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Precautions - Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

The following wetland types intersect your project area in one or more locations:

Wetland Types	NWI Classification Code	Total Acres
Freshwater Emergent Wetland	PEM/SSC	35.579

Trust Resources List

Freshwater Emergent Wetland	PEMCx	0.9414

Appendix D
Preliminary Jurisdictional Delineation for the El Camino Real Bridge Replacement Project

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PRELIMINARY JURISDICTIONAL DELINEATION FOR THE EL CAMINO REAL BRIDGE REPLACEMENT PROJECT

PREPARED FOR:

City of San Diego
Engineering and Capital Projects Department
600 B Street, Suite 800, MS 908A
San Diego, CA 92101

PREPARED BY:

ICF International
9775 Businesspark Avenue, Suite 200
San Diego, CA 92131
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September 2012

ICF International. 2012. Preliminary Jurisdictional Delineation Report for the El Camino Real Bridge Replacement Project. September. (ICF 00333.09.) Prepared for City of San Diego, San Diego, CA.

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Acronyms and Abbreviations

BSA	biological study area
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
City	City of San Diego
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
FAC	facultative
FACW	facultative wetland
ICF	ICF International
JDs	jurisdictional delineations
JPA	Joint Powers Authority
km	kilometers
MSL	mean sea level
NRCS	Natural Resources Conservation Service
OBL	obligate
OHWM	ordinary high-water mark
PJD	Preliminary Jurisdictional Determination
Porter-Cologne	Porter-Cologne Water Quality Control Act
Project	El Camino Real Bridge Replacement Project
RGL	Regulatory Guidance Letter
RPWs	Relatively permanent waters
RWQCB	Regional Water Quality Control Board
SWANCC	Solid Waste Agency of North Cook County
SWRCB	State Water Resources Control Board
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WS	Waters of the State
WUS	Waters of the U.S.

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Chapter 1
Introduction

This report provides regulatory information, methods, and results for a routine-level jurisdictional delineation of jurisdictional waters and wetlands present within the El Camino Real Bridge Replacement biological study area (BSA), for a Preliminary Jurisdictional Determination (PJD).

The purpose of the delineation is to assess the limits of federal and state jurisdiction, within and adjacent to the proposed Project site, to support the resource-agency permitting process. This jurisdictional delineation report describes the resources subject to regulation by the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Game (CDFG).

Project Location

The El Camino Real Bridge Replacement Project (Project) is located in the City of San Diego, San Diego County, California (Figures 1 and 2 [Figures are included in Appendix A]). The site is located approximately 2 kilometers (km) (1.25 miles) east of Interstate 5. It is accessible from the east and west from Via de la Valle and from the south from Del Mar Heights Road. The portion of the road being modified is the segment of El Camino Real that extends from Via de la Valle to San Dieguito Road. The City of San Diego (City) proposes to modify this segment of El Camino Real and replace the bridge in order to improve the structural integrity of the bridge over the San Dieguito River, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, relieve traffic congestion, and improve consistency with the adopted land use plan in the Project area. Four different alternatives have been analyzed: the central alignment alternative, the western alignment alternative, the eastern alignment alternative, and the roundabout alternative. The Project site is located on the U.S. Geological Survey (USGS) Del Mar Quadrangle, Sections 6 & 7, Township 14 South, and Range 3 West.

Project History

The portion of the road being modified is the segment of El Camino Real that extends from Via de la Valle to San Dieguito Road. This portion of El Camino Real, classified as a 2-lane collector, is approximately 2,400 feet long, 23 feet wide, has one travel lane in each direction, and has no shoulders, bike lanes, or pedestrian walkways. The road segment includes a bridge over the San Dieguito River that is 340 feet long and 27 feet wide (24 feet wide curb to curb on the concrete travel surface, with 1.5-foot-wide raised concrete curbs on each side). The elevation of the bridge is not high enough to completely pass the 100-year flood. The City proposes to modify this segment of El Camino Real and replace the bridge in order to improve the structural integrity of the bridge over the San Dieguito River, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, relieve traffic congestion, and improve consistency with the adopted land use plan in the Project area.

Project Description

Four different alternatives have been analyzed (Figures 4 to 7):

- Central alignment alternative
- Western alignment alternative
- Eastern alignment alternative
- Roundabout alternative

The Project would be constructed in stages, where the existing road and bridge would remain open during construction until one new side is constructed, and then traffic would be diverted to the new side while the other side of the road and bridge are constructed. For the eastern alignment and roundabout alternatives, the bridge and road north of the bridge would be constructed in one stage, independently of the existing bridge and road. Construction would last approximately 2.5 to 3.5 years, depending on the alternative.

Impacts on jurisdictional wetlands, as well as upland areas, will result from all four alternatives. Mitigation for impacts on wetlands resulting from the Project will be accomplished on a parcel owned by the San Dieguito River Park Joint Powers Authority (JPA mitigation area). This parcel is located west of El Camino Real and south of the San Dieguito River (Figures 3 and 8). Historically, this area has supported agricultural practices but has remained fallow for several years. Currently, this area has revegetated naturally and supports native and non-native vegetation. Thus, implementation of a mitigation project in this area will result in impacts on vegetated areas. Mitigation for impacts on uplands will be accomplished through a contribution to the City's Habitat Acquisition Fund.

The delineated impact area includes areas permanently impacted by the installation of Project features (e.g., the bridge, manufactured slopes, sidewalks, etc.), referred to as the permanent footprint, as well as construction corridors and staging areas that will be disturbed only during Project construction, referred to as construction corridors. The construction corridors will result in temporary impacts and will be restored to their original condition and/or revegetated following Project completion. Construction access will be obtained through areas already considered impacted by the proposed Project (i.e., the permanent footprint or construction corridor). Thus, access roads are not considered separately in this report. A staging area has been proposed at the southern end of the Project area, just northeast of the junction of El Camino Real Road and San Dieguito Road. Use of this area will not result in additional impacts.

The existing bridge has not been incorporated into the design for the eastern and roundabout alternatives. Thus, under these alternatives, the existing bridge will be demolished, resulting in additional impacts. These impacts have been incorporated into the footprints for the eastern and roundabout alternatives.

The mitigation area proposed for this Project currently supports vegetated areas. Impacts occurring in this area in association with the mitigation plan are also addressed in this delineation.

Chapter 2
Regulatory Background

The following sections summarize the regulations imposed on each type of jurisdictional feature potentially present within the proposed Project area.

U.S. Army Corps of Engineers Regulated Activities

USACE-regulated activities under Section 404 of the Clean Water Act (CWA) involve a discharge of dredged or fill material into Waters of the U.S. (WUS). A discharge of fill material includes, but is not limited to, grading, placing rip-rap for erosion control, pouring concrete, laying sod, and stockpiling excavated material into WUS. Activities that generally do not involve a regulated discharge (if performed specifically in a manner to avoid discharges) include driving pilings, performing some drainage channel maintenance activities, constructing temporary mining and farm/forest roads, and excavating without stockpiling.

Waters of the U.S.

WUS, as defined in the Code of Federal Regulations (CFR) Title 33, Section 328.3, include all waters or tributaries to waters, such as lakes, rivers, intermittent and perennial streams, mudflats, sand flats, natural ponds, wetlands, wet meadows, and other aquatic habitats.

Frequently, a WUS (with at least intermittently flowing water or tidal influences) is demarcated by the ordinary high-water mark (OHWM), defined in CFR 328.3(e) as:

> that line on the shore established by the fluctuations of water and indicated by physical characteristics such as [a] clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Where an OHWM is present, waters may be defined as WUS when connectivity is determined to be present.

Wetlands

According to the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), three criteria must be satisfied to classify an area as a jurisdictional wetland: (1) a predominance of plant life that is adapted to life in wet conditions (hydrophytic vegetation); (2) soils that saturate, flood, or pond long enough during the growing season to develop anaerobic conditions in the upper part (hydric soils); and (3) permanent or periodic inundation or soils saturation, at least seasonally (wetland hydrology).

Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers

In 1986, in an attempt to clarify the reach of its jurisdiction, USACE stated that Section 404(a) extends to intrastate waters that:

> (a) are or would be used as habitat by birds protected by migratory bird treaties, or (b) are or would be used as habitat by other migratory birds which cross state lines, or (c) are or would be used as habitat for endangered species, or (d) used to irrigate crops sold in interstate commerce (51 *Federal Register* 41217).

As a result of the 2001 *Solid Waste Agency of North Cook County (SWANCC*) case, the U.S. Supreme Court held that USACE may not rely on the Migratory Bird Rule to establish a significant nexus to interstate or foreign commerce. Although no formal guidance was issued by USACE interpreting the extent to which the *SWANCC* decision would limit jurisdictional determinations, in practice USACE considers intrastate waters as WUS where there is an appropriate connection to a navigable water or other clear interstate commerce connection. Therefore, WUS, including jurisdictional wetlands, must show connectivity with (be tributary to) traditionally navigable waters (TNW) for such a feature to be considered jurisdictional.

Rapanos v. United States and *Carabell v. U.S. Army Corps of Engineers*

In 2006, the U.S. Supreme Court again issued an opinion regarding the extent of USACE jurisdiction over certain waters under Section 404 of the CWA. The *Rapanos-Carabell* consolidated decisions addressed the question of jurisdiction over attenuated tributaries to WUS as well as wetlands adjacent to those tributaries. In a plurality decision, five of the nine justices remanded both cases to the lower courts for re-evaluation. However, those five justices disagreed as to what the test for determining jurisdiction should be.

The first approach (Justices Scalia, Roberts, Thomas, and Alito) held that "waters of the Unites States" include only those relatively permanent, standing, or continuously flowing bodies of water "forming geographic features" that are described in ordinary phrasing as "streams, oceans, river and lakes" (i.e., with surface water connection to navigable waters). This would not exclude streams, rivers, or lakes that might dry up in extraordinary circumstances, such as drought, or seasonal rivers that contain continuous flow during some months of the year but no flow during dry months (*Rapanos et ux. et al. v. United States*, 547 U.S. 04-1034 [2006]).

The second approach (Justice Kennedy) concluded that Congress enacted the CWA to "restore and maintain the chemical, physical, and biological integrity of the nation's waters" (33 United States Code [USC] Section 1250(a)). Therefore, if the tributaries and adjacent wetlands, alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters understood as navigable in the traditional sense, these waters come within the statutory phrase "navigable waters." USACE's jurisdiction under the CWA reaches tributaries and other waters and wetlands with a significant nexus to waters that are in fact navigable or could reasonably be made so. However, USACE must establish a significant nexus on a case-by-case basis when seeking to regulate wetlands based on adjacency to nonnavigable tributaries to avoid unreasonable applications of the CWA.

USACE and the U.S. Environmental Protection Agency (EPA) issued guidance related to the *Rapanos* decision on June 5, 2007. The guidance identifies those waters over which the agencies (USACE and EPA) will assert jurisdiction categorically and on a case-by-case basis, based on the reasoning of the *Rapanos* opinions. To summarize, USACE will continue to assert jurisdiction over:

1. TNWs and their adjacent wetlands;
2. nonnavigable tributaries of TNWs that are relatively permanent (e.g., tributaries that typically flow year-round or have a continuous flow at least seasonally) and wetlands that directly abut such tributaries (e.g., not separated by uplands, berm, dike, or similar feature) (note: relatively permanent waters [RPWs] do not include ephemeral tributaries, which flow only in response to precipitation, and intermittent streams, which do not typically flow year-round or have continuous flow at least seasonally [e.g., typically three months]); and
3. non-RPWs if determined (in a fact-specific analysis) to have a significant nexus with a TNW, including nonnavigable tributaries that do not typically flow year-round or have continuous flow at least seasonally, wetlands adjacent to such tributaries, and wetlands adjacent to but not directly abutting a relatively permanent nonnavigable tributary. Absent a significant nexus, jurisdiction is lacking.

A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical, and/or biological integrity of a TNW. Principal considerations when evaluating significant nexus include volume, duration, and frequency of the flow of water in the tributary and the proximity of the tributary to a TNW, plus hydrologic, ecologic, and other functions performed by the tributary and all of its adjacent wetlands. Certain ephemeral waters in the arid west are distinguishable from the geographic features described above where such ephemeral waters are tributaries and have a significant nexus to downstream TNWs. For example, these ephemeral tributaries may serve as a transitional area between the upland environment and the TNW. Such ephemeral tributaries may provide habitat for wildlife and aquatic organisms in downstream TNWs and support nutrient cycling, sediment retention and transport, pollutant trapping and filtration, and improvement of water quality.

Swales or erosional features (e.g., gullies and small washes characterized by low volume and infrequent or short-duration flow) are generally not WUS because they are not tributaries or they do not have a significant nexus to downstream TNWs. In addition, ditches (including roadside ditches) excavated wholly in uplands and draining only uplands that do not carry a relatively permanent flow of water are generally not WUS because they are not tributaries or they do not have a significant nexus to downstream TNWs. Even when not jurisdictional under Section 404 of the CWA, these features may still be jurisdictional at State or local levels, such as under Section 401 of the CWA, the Porter-Cologne Water Quality Control Act (Porter-Cologne), and/or Section 1602 of the California Fish and Game Code.

Approved Jurisdictional Determinations

Prior to the *Rapanos* guidance, USACE required districts to request concurrence for only those jurisdictional delineations (JDs) where the district was planning to assert jurisdiction over a nonnavigable, intrastate, isolated water, and/or wetland. Under *Rapanos*, the agencies require that all determinations for nonnavigable, isolated waters be evaluated by USACE and EPA headquarters prior to USACE making a final decision on the JD (an "approved JD").

An approved JD is an official USACE determination that jurisdictional or navigable WUS are either present or absent on a particular site. The approved JD precisely identifies the limits of those waters on the Project site. Approved JDs are documented in accordance with Regulatory Guidance Letter (RGL) 07-01 and require the use of the approved JD form (*Rapanos* form). An approved JD form is completed for each reach of each tributary on the Project site and is reviewed by USACE and EPA. Legally, an approved JD represents USACE official determination that the JD's findings are correct, is valid for 5 years, can be used and relied upon in a CWA citizen's lawsuit if its legitimacy is challenged (except under extraordinary circumstances), and can be immediately appealed (33 CFR Part 331).

Preliminary Jurisdictional Determinations

Under RGL 08-02, dated June 26, 2008, USACE established an alternative to the approved JD process: the "preliminary JD." A preliminary JD is a non-binding written indication that there may be WUS, including wetlands, on a project site and identifies the approximate location of these features. Preliminary JDs are used when a landowner, permit applicant, or other affected party elects to voluntarily waive or set aside questions regarding CWA jurisdiction over a particular site, usually in the interest of allowing the landowner to move ahead expeditiously to obtain 404 authorization where the party determines that it is in his or her best interest to do so. A preliminary JD is not an official determination regarding the jurisdictional status of potentially jurisdictional features and has no bearing on approved JDs. A preliminary JD cannot be used to confirm the absence of jurisdictional waters or wetlands, is advisory in nature, and cannot be appealed. It is considered "preliminary" because a recipient can later request an approved JD if one is necessary or appropriate.

Finally, although a preliminary JD may be chosen by the applicant, the district engineer reserves the right to use an approved JD where warranted. A preliminary JD is documented using the preliminary JD form, provided as Attachment 1 to RGP 08-02. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD treats all waters and wetlands that would be affected in any way except by the permitted activity as if they are jurisdictional.

State Water Resources Control Board Regulated Activities/Regional Water Quality Control Board

In California, the State Water Resources Control Board (SWRCB) and nine RWQCBs regulate activities within State and federal waters under Section 401 of the CWA and the State Porter-Cologne Act. The SWRCB is responsible for setting statewide policy, coordinating and supporting the RWQCB efforts, and reviewing petitions that contest RWQCB actions. Each semi-autonomous RWQCB sets water quality standards, issues 401 certifications and waste discharge requirements, and take enforcement action for projects occurring within their boundary. However, when a project crosses multiple RWQCB jurisdictional boundaries, the SWRCB becomes the regulating agency for both of these acts and issues project permits.

Section 401 of the Clean Water Act

Section 401 of the CWA requires that

> any applicant for a federal permit for activities that involve a discharge to waters of the United States shall provide the federal permitting agency a certification from the state in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the federal Clean Water Act.

Therefore, in California, before USACE will issue a Section 404 permit, applicants must apply for and receive Section 401 water quality certification or waiver from the RWQCB or SWRCB, as applicable. Under Section 401 of the CWA, the SWRCB/RWQCB regulates at the State level all activities that are regulated at the federal level by USACE. Therefore, SWRCB/RWQCB jurisdiction usually matches the jurisdictional boundaries for WUS (mapped at the OHWM). However, if waters are determined not to be WUS, they may still be subject to SWRCB/RWQCB jurisdiction based on the Porter-Cologne Act.

Porter-Cologne Act

Under the Porter-Cologne Act, the SWRCB/RWQCB regulates all such activities—as well as dredging, filling, or discharging materials into Waters of the State (WS)—that are not regulated by USACE because of a lack of connectivity with a navigable water body or lack of an OHWM. The SWRCB/RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, within any region that could affect waters of the state" (California Water Code 13260[a]), pursuant to provisions of the State Porter-Cologne Act. WS are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code 13050 [e]). Such waters may include waters not subject to regulation under Section 404, such as swales or isolated vernal pools.

California Department of Fish and Game Regulated Activities

Under California Fish and Game Code, Sections 1600–1616, CDFG has the authority to regulate work that will substantially divert or obstruct the natural flow—or substantially change or use any material from the bed, channel, or bank—of any river, stream, or lake. CDFG also has the authority to regulate work that will deposit or dispose of debris, wastewater, or other material containing crumbled, flaked, or ground pavement that may pass into any river, stream, or lake. This regulation takes the form of a requirement for a Lake or Streambed Alteration Agreement and is applicable to all work involving State or local government discretionary approvals.

Section 1602 of the California Fish and Game Code

The California Fish and Game Code mandates that

> it is unlawful for any entity to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds, without first notifying the department of such activity.

CDFG jurisdiction includes ephemeral, intermittent, and perennial watercourses (including dry washes) and lakes characterized by the presence of (1) definable bed and banks and (2) existing fish or wildlife resources. Furthermore, CDFG jurisdiction is often extended to habitats adjacent to watercourses, such as oak woodlands in canyon bottoms or willow woodlands that function hydrologically as part of the riparian system. Historical court cases have further extended CDFG jurisdiction to include watercourses that seemingly disappear but re-emerge elsewhere. Under the CDFG definition, a watercourse need not exhibit evidence of an OHWM to be claimed as jurisdictional.

Water features such as vernal pools and other seasonal swales where the defined bed and bank are absent and the feature is not contiguous or closely adjacent to other jurisdictional features are generally not asserted to fall within State jurisdiction under Section 1602. CDFG generally does not assert jurisdiction over human-made water bodies unless they are located where such natural features were previously located or (importantly) where they are contiguous with existing or prior natural jurisdictional areas.

Chapter 3
Methodology

Project Research

To prepare for a field visit, surveyors obtained an aerial photograph (1 inch = 2100 feet) of the site and used it to identify potential site features such as vegetation types, topographic changes, or visible drainage patterns.

Additionally, the relevant U.S. Department of Agriculture (USDA) soil survey map was reviewed to identify the soil series that occur on the Project site. These mapped soil series were compared with the Field Office Official List of Hydric Soil Map Units (U.S. Department of Agriculture 2011) and the pertinent USDA Natural Resources Conservation Service (NRCS) Soil Survey online map to determine the presence or absence, and location, of hydric soils within the Project site (USDA 2011).

Field Investigation

ICF International (ICF) biologist Andrew Borcher conducted the initial wetland delineation on August 25, 2009. Due to a two-year time lapse, surveys were updated in 2011. ICF biologist Dale Ritenour carried out an update to the delineation on August 16, 2011, and a delineation of additional areas on January 26, 2012. The Project boundary was surveyed to determine the presence/absence of any potential jurisdictional features, though the Rancho del Mar property was not accessed for this delineation; any potential features identified were then investigated further to determine whether they met the criteria for federal, state, or local jurisdiction. All features were delineated following USACE, RWQCB, and CDFG guidance.

Delineated boundaries of all features identified within the Project site were mapped on an aerial photograph. A Wetland Determination data form was completed for each sample point (Appendix B).

Delineation Methods

USACE, CDFG, and RWQCB have differing criteria for delineation of jurisdictional water features. The following sections describe the methods for delineation of jurisdictional limits for each agency.

Delineation of U.S. Army Corps of Engineers Jurisdictional Limits

ICF International methods for delineating USACE jurisdictional features follow the guidelines set forth in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Regional Supplement, USACE 2008a). USACE takes jurisdiction over wetlands with connectivity to relatively permanent and traditionally navigable waterways, and over non-wetland waters including streambeds, rivers, and open water.

Three criteria normally must be fulfilled in order to classify an area as a jurisdictional USACE wetland: (1) a predominance of hydrophytic vegetation, (2) the presence of hydric soils, and (3) the presence of wetland hydrology. Details of the application of these techniques are described below.

- **Hydrophytic Vegetation.** The hydrophytic vegetation criterion is satisfied at a location if greater than 50% of all the dominant species present within the vegetation unit have a wetland indicator status of obligate (OBL), facultative wetland (FACW), or facultative (FAC) (Environmental Laboratory 1987). An *OBL indicator status* refers to plants that have a 99% probability of occurring in wetlands under natural conditions. A *FACW indicator status* refers to plants that usually occur in wetlands (67 to 99% probability) but are occasionally found elsewhere. A *FAC indicator status* refers to plants that are equally likely to occur in wetlands or elsewhere (estimated probability 34 to 66% for each). The wetland indicator status used for this report follows the *National List of Plant Species that Occur in Wetlands: California (Region 0)* (U.S. Fish and Wildlife Service 1988).
- **Hydric Soils.** The hydric soil criterion is satisfied at a location if soils in the area can be inferred or observed to have a high groundwater table, if there is evidence of prolonged soil saturation, or if there are any indicators suggesting a long-term reducing environment in the upper 18 inches of the soil profile. Reducing conditions are most easily assessed using soil color. Soil colors were evaluated using the *Munsell Soil Color Charts* (Kollmorgen Corporation 1975).
- **Wetland Hydrology.** The wetland hydrology criterion is satisfied at a location based upon conclusions inferred from field observations that indicate an area has a high probability of being inundated or saturated (flooded, ponded, or tidally influenced) long enough during the growing season to develop anaerobic conditions in the surface soil environment, especially the root zone (Environmental Laboratory 1987; USACE 2008a).

Areas meeting all three of these parameters are generally designated as USACE wetlands.

A Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States: A Delineation Manual (USACE 2008b; OHWM field guide) describes physical evidence that should be used to ascertain the lateral limits of jurisdiction; generally more than one physical indicator or other means for determining the OHWM is used. The following physical indicators of OHWM were used in the field:

- Presence of litter and debris
- Wracking
- Bed and banks

When documenting the OHWM width within the stream, surveyors took measurements of stream width at various locations using a survey measuring tape. Distinct changes in channel width or riparian vegetation width were recorded.

Delineation of Regional Water Quality Control Board Jurisdictional Limits

The RWQCB jurisdiction generally follows the delineation of USACE jurisdictional wetland or nonwetland waters of the U.S. Since this site has bed-and-bank OHWM and connectivity to RPW and TNW, the boundaries of the RWQCB jurisdiction will match that of USACE.

Delineation of California Department of Fish and Game Jurisdictional Limits

Evaluation of California Fish and Game Code jurisdiction followed the guidance of related CDFG materials and standard practices by CDFG personnel. CDFG generally exerts jurisdiction over streambeds and to habitats adjacent to watercourses, such as willow woodlands that function hydrologically as part of the riparian system. CDFG jurisdiction was delineated by measuring outer boundaries of the greater of either the top of bank measurement (bank full width) or the extent of associated riparian or wetland vegetation.

Delineation of City of San Diego Jurisdictional Limits

The City of San Diego Municipal Code section 113.0103 defines wetlands as areas characterized by any of the following conditions:

1. All areas persistently or periodically containing naturally occurring wetland vegetation communities characteristically dominated by hydrophytic vegetation, including but not limited to salt marsh, brackish marsh, freshwater marsh, riparian forest, oak riparian forest, riparian woodlands, riparian scrub, and vernal pools;
2. Areas that have hydric soils or wetland hydrology and lack naturally occurring wetland vegetation communities because human activities have removed the historic wetland vegetation or catastrophic or recurring natural events or processes have acted to preclude the establishment of wetland vegetation as in the case of salt pannes and mudflats;
3. Areas lacking wetland vegetation communities, hydric soils and wetland hydrology due to non-permitted filling of previously existing wetlands

Jurisdictional delineations for the City of San Diego follow the same extents as CDFG jurisdictional habitat.

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Chapter 4
Results and Jurisdictional Impacts

Physical Description

El Camino Real is located approximately 1.25 miles east of Interstate 5. It is accessible from the east and west from Via de la Valle and from the south from Del Mar Heights Road (Figure 2). The BSA extends across the floodplain of the San Dieguito River and is generally flat with the exception of the river bed. The San Dieguito River channel east of the bridge is fortified with quarter ton rip rap while the channel west of the bridge consists of a sandy substrate.

Two constructed drainage channels parallel the Project area. Both support disturbed and wetland vegetation. One drainage is located just south of Via de la Valle; another parallels the east side of El Camino Real. Another drainage parallels the north side of Via de la Valle and is generally outside of the Project area.

Surrounding land uses north of the existing bridge include an equestrian center, commercial area, and recreational fields. South of the bridge, a golf course was recently constructed (in 2004) on the eastern side of the road and fallow agricultural fields exist to the west.

Elevation along the alignment is approximately 20 feet above mean sea level (MSL) but drops between 5 to 10 feet from the existing roadbed to the adjacent habitat. Elevation at the San Dieguito River bottom is approximately 5 feet above MSL

Soils

The following four soil series occur within the BSA: Tujunga series, the Grangeville series, the Corralitos series, and Huerohuero series (USDA 1973), and are displayed on Figure 3.

The Tujunga series (TuB) consists of very deep, excessively drained sands found on flood plains and alluvial fans, having 0 to 5 percent slopes. Tujunga sand occurs in the San Dieguito River floodplain, including the bridge area, the JPA mitigation area, and much of the polo field, and is a hydric soil type.

The Grangeville series (GoA) consists of somewhat poorly drained, very deep sandy loams found on alluvial plains and fans, having 0 to 2 percent slopes. Grangeville fine sandy loam occurs north and south of the San Dieguito floodplain, and is a hydric soil within alluvial fans.

The Corralitos series (CsC, CsB) consists of somewhat excessively drained, very deep loamy sands that are typically found in alluvial fans and narrow valleys on 0 to 15 percent slopes. Corralitos loamy sand (5 to 9 percent slopes; CsC) occurs southeast of the study area and in the northwestern portion of the survey area near the intersection of El Camino Real and Via de la Valle. Corralitos loamy sand, 5 to 9 percent slope, is not a hydric soil. Corralitos loamy sand (0 to 2 percent slopes; CsB) occurs in the northeast corner of the BSA and is a hydric soil associated with alluvial fans.

The Huerohuero (HrE2) series consists of moderately well-drained loams with a clay subsoil found on 2 to 30 percent slopes. Huerohuero loam (15 to 30 percent slopes), eroded, occurs along San Dieguito Road. Huerohuero loam (15 to 30 percent slopes) is not a hydric soil.

Sample Points

Fifteen sample points were taken within the Project area to inspect for the potential extents of wetlands and document site conditions (Figure 3). Data sheets for each sample point are included in Appendix B. Representative sample points and site photos are included in Appendix C. Results of each sampling point are discussed below.

Sample Point 1

Sample point 1 is on the south side of San Dieguito River adjacent at the bottom of the bank. Habitat consists of freshwater marsh dominated by pickleweed (*Salicornia virginca*; OBL), alkali heath (*Frankenia grandiflora*; FACW), and broad-leaved cattails (*Typha latifolia*; OBL). These three plants are OBL or FACW thus meeting the hydrophytic vegetation criteria. Redox features were found throughout the top twelve inches, meeting the sandy redox indicator for hydric soils. Saturation was present at 3 inches and sediment deposits were observed, meeting the hydrology indicator. This area meets all three criteria and is a USACE wetland.

Sample Point 2

Sample Point 2 is located at the top of the slope above the San Dieguito River channel. The vegetation community is dominated by tamarisk (*Tamarix ramosissima*; FAC), western ragweed (*Ambrosia psilostachya*; FACW), salt heliotrope (*Heliotropium curassavicum*; OBL), and field mustard (*Hirschfeldia incana*; NI). Three of these four species are FAC, FACW, or OBL, meeting the hydrophytic vegetation criterion. A soil pit dug to the restrictive rip-rap layer at 10 inches did not uncover any hydric indicators. No indicators of wetland hydrology were observed at this location. While the vegetation community at this point is dominated by facultative plants, no hydric soils or hydrology are present, and this area is not a USACE jurisdictional wetland. The area is a CDFG riparian habitat.

Sample Point 3

Sample point 3 is on the north side of San Dieguito River adjacent at the bottom of the bank. Habitat consists of freshwater marsh dominated by salt grass (*Distichlis spicata*; FACW), pickleweed (OBL), tamarisk (FAC), and mule fat (*Baccharis salicifolia*; FACW). These four plants are OBL, FACW, or FAC thus meeting the hydrophytic vegetation criteria. A layer of gleyed soils at 6 to 14 inches meets the depleted below dark surface indicator. Water stained leaves and sediment deposits show wetland hydrology. This area meets all three criteria and is a USACE wetland.

Sample Point 4

Sample point 4 is located above sample Point 3, outside of the river channel. The vegetation here is dominated by mule fat (FACW), western ragweed (FACW), and field mustard (NI). Two of the three of these dominates are FACW, which meets the hydrophytic vegetation criterion. A soil pit dug to the restrictive rip-rap layer at 10 inches did not uncover any hydric indicators. No indicators of wetland hydrology were observed at this location. While the vegetation community at this point is dominated by hydrophytic plants, no hydric soils or hydrology are present, and this area is not a USACE wetland. This area is CDFG jurisdictional riparian habitat.

Sample Point 5

Sample point 5 is located in the freshwater marsh immediately southeast of the intersection of Via de la Valle and El Camino Real. The vegetation is dominated by goldenbush (*Isocoma menziesii*; FAC), yellow nutsedge (*Cyperus esculentus*; FACW), lambsquarters (*Chenopodium album*; FAC), and wild celery (*Apium graveolens*; FACW). A soil pit discovered a gleyed matrix below a dark surface material, which meets the "thick below dark surface" criterion. Wetland hydrology is indicated by surface water next to a water table at 1 inch, and sediment deposits. This area meets all three criteria and is a USACE wetland.

Sample Point 6

Sample point 6 is located next to Sample Point 5 at the toe of the slope. The vegetation here is dominated by salt heliotrope (OBL), lambsquarters, goldenbush (FAC), and tree tobacco (*Nicotiana glauca*; FAC). All of these are OBL, FACW, or FAC, which meets the hydrophytic vegetation criterion. A soil pit dug to 12 inches did not uncover any hydric indicators. No indicators of wetland hydrology were observed at this location. While the vegetation community at this point is dominated by hydrophytic plants, no hydric soils or hydrology are present, and this area is not a USACE jurisdictional wetland.

Sample Point 7

Sample point 7 is located immediately north of the driveway into the polo fields. The vegetation here is dominated by knotgrass (*Paspalum distichum*; OBL), and appears to be maintained in a disturbed state by mowing. A soil pit dug to 10 inches showed 10 percent redox features, meeting the sandy redox indicator. Evidence of wetland hydrology was shown by landform position, immediately adjacent to surface water in the dry season (August) and oxidized rhizospheres along living roots. While this area is disturbed by mowing, it exhibits all three criteria and is a USACE wetland.

Sample Point 8

Sample point 8 is on the north side of San Dieguito River, and is west of the bridge. Habitat is dominated by tamarisk (FAC), pickleweed (OBL), and yellow nutsedge (FACW), meeting the criterion for wetland vegetation. Redox features were observed in a layer from 3 to 12 inches deep, meeting the sandy redox criterion. Saturation present at the surface shows wetland hydrology. This area meets all three criteria and is a USACE wetland.

Sample Point 9

Sample point 9 is located just south of Sample Point 8. The tamarisk scrub is dominated by tamarisk (FAC), goldenbush (FAC), and field mustard (NI). Two of the three of species are FAC, which meets the hydrophytic vegetation criterion. A soil pit dug to 12 inches did not uncover any hydric indicators, but this point is in a mapped hydric soil type (Tujunga sands). No indicators of wetland hydrology were observed at this location. While the vegetation community at this point is dominated by hydrophytic plants and the area is a mapped hydric soil, no hydrology is present, and this area is not a USACE wetland.

Sample Point 10

Sample point 10 is in the drainage near the intersection of Via de la Valle and El Camino Real. Vegetation is dominated by lambsquarters (FAC) which meets the criterion for wetland vegetation. Redox features were observed throughout a pit dug to 12 inches, meeting the sandy redox criterion. Water stained leaves and sediment deposits show wetland hydrology. This area meets all three criteria and is a USACE wetland and CDFG state streambed.

Sample Point 11

Sample point 11 is located near Sample Point 7, on the road embankment for El Camino Real. The vegetation is dominated by salt heliotrope (OBL) and crabgrass (*Cynodon dactylon;* NI), which does not meet the hydrophytic vegetation criterion. A soil pit dug to 12 inches did not uncover any hydric indicators. No indicators of wetland hydrology were observed at this location. This area is not a USACE wetland or CDFG riparian habitat.

Sample Point 12

Sample point 12 is in the prominent depression in the JPA mitigation area to the west of El Camino Real. The vegetation is dominated by curly dock (*Rumex crispus*; FACW) and salt grass (FACW) which meets the hydrophytic vegetation criterion. A soil pit dug to 16 inches did not uncover any hydric indicators. No indicators of wetland hydrology were observed at this location. This area is not a USACE wetland but is a CDFG riparian habitat.

Sample Point 13

Sample point 13 is located in mule fat scrub within the JPA mitigation area. The vegetation is dominated by mule fat, tree tobacco (FAC), dwarf nettle (*Uritca uriens*; NI), and wild barley (*Hordeum murinum*; NI) which does not meet the hydrophytic vegetation criterion. A soil pit dug to 15 inches did not uncover any hydric indicators. No indicators of wetland hydrology were observed at this location. This area is not a USACE wetland but is a CDFG riparian habitat.

Sample Point 14

Sample point 14 is in the prominent depression in the JPA mitigation area to the west of El Camino Real. The vegetation is dominated by curly dock (FACW), rabbitsfoot grass (*Polypogon* *monspeliensis*; FACW), and horseweed (*Erigeron (Conyza) canadensis;* UPL), which meets the hydrophytic vegetation criterion. A soil pit dug to 14 inches did not uncover any hydric indicators. No indicators of wetland hydrology were observed at this location. This area is not a USACE wetland but is a CDFG riparian habitat.

Sample Point 15

Sample point 15 is located in the southeast corner of the JPA mitigation area. This is an isolated area of disturbed salt-marsh. The vegetation is dominated by alkali heath (FACW), which meets the hydrophytic vegetation criterion. A soil pit dug to 14 inches did not uncover any hydric indicators. No indicators of wetland hydrology were observed at this location. This area is not a USACE wetland but is a CDFG riparian habitat.

Connection to Navigable Water

The San Dieguito River is an RPW which is tributary to the Pacific Ocean (TNW). This connectivity provides a nexus for regulation of the waters of the U.S. by the USACE.

Jurisdictional Limits

Descriptions of jurisdictional areas within the BSA are provided below and are mapped on Figure 3 (Appendix A). Descriptions of the jurisdictional features within the JPA mitigation area are discussed below and presented in Figure 8.

U.S. Army Corps of Engineers Jurisdictional Limits

A majority of the San Dieguito River channel contains wetland vegetation, hydrology, and soils, and is connected to a TNW, and would be regulated as USACE wetland waters of the U.S. (Table 1; Figure 3). There are 7.95 acres of USACE jurisdictional habitat within the BSA.

The channel that skirts the western edge of polo field and the east side of El Camino Real is maintained in a disturbed condition (mowing), but is dominated by wetland vegetation, hydrology, and soils, and is therefore a USACE wetland WUS. The section of this channel within the eucalyptus woodland lacks hydrophytic vegetation and is non-wetland WUS (Table 1; Figure 3). A total of 3.82 acres of USACE wetland WUS and 0.02 acre of non-wetland WUS is present within the BSA.

The field to the north of the polo fields is referred to as the Rancho del Mar property. This area was not accessible to ICF. The delineation of this area follows the jurisdictional delineation presented in the Natural Environment Study Report for the El Camino Real Road/Bridge Widening Project (Tierra 2006), as supported by aerial imagery and observation of the property from the right-of-way. This field was mapped as disturbed salt marsh based upon the prevalence of saltgrass. It appears to lack direct connectivity to the adjacent waters of the US and is therefore a USACE adjacent wetland (Table 1; Figure 3). A total of 4.11 acres of adjacent wetland is present within the BSA.

Table 1. Jurisdictional Waters and Wetlands Present within the BSA

Jurisdictional Habitat	Area (acres)
USACE/RWQCB	
Wetland waters of the U.S.	3.82
Non-wetland waters of the U.S.	0.02
Adjacent wetland	4.11
TOTAL USACE/RWQCB Jurisdictional Area	**7.95**
CDFG/City of San Diego	
CDFG state streambed	3.84
CDFG riparian habitat	6.33
TOTAL CDFG Jurisdictional Area	**10.17**

Regional Water Quality Control Board Jurisdictional Limits

The RWQCB jurisdictional features are the same extents as the USACE jurisdictional limits. There are 7.95 acres of USACE jurisdictional habitat within the BSA, including 3.82 acres of USACE wetland WUS, 0.02 acre of non-wetland WUS, and 4.11 acres of adjacent wetlands (Table 1).

California Department of Fish and Game Jurisdictional Limits

A total of 3.84 acres of CDFG state streambeds are present within the BSA (Table 1; Figure 3).

CDFG jurisdictional limits extend beyond the OHWM and top of bank of the state streambed to the limits of associated riparian habitat. CDFG riparian habitat within the BSA includes riparian associated southern willow scrub, mule fat scrub, and freshwater marsh. A total of 6.33 acres of associated riparian habitat occurs within the BSA (Table 1; Figure 3).

City of San Diego Jurisdictional Limits

City of San Diego jurisdictional limits follow the 1-parameter approach, which only requires the presence of wetland vegetation, and has the same extents as CDFG jurisdictional habitat.

Impacts

Permanent and temporary impacts associated with the four alignments and the JPA creation area are presented in Table 2 and discussed below.

Table 2. Permanent/Temporary Jurisdictional Impacts by Alignment (Acres)

Jurisdictional Area	Western	Central	Eastern	Roundabout	JPA Creation Area
USACE/RWQCB					
Wetland waters of the U.S.	0.82/0.55	1.49/0.37	1.07/1.11	1.11/1.14	0
Adjacent Wetland	1.93/0.50	2.19/0.56	1.61/0.55	3.11/0.68	0
Non-wetland waters of the U.S.	0/0	0/0	0.01/0.01	0.01/0.01	0
TOTAL USACE/RWQCB Jurisdictional Impacts	**2.75/1.05**	**3.68/0.93**	**2.69/1.67**	**4.23/1.83**	**0**
CDFG/City of San Diego					
CDFG state streambed	0.82/0.55	1.49/0.37	1.07/1.11	1.11/1.14	0
CDFG riparian habitat	2.15*/0.65*	2.26/0.62	1.88/0.59	3.44/0.73	0.72/0
TOTAL CDFG/City of San Diego Jurisdictional Impacts	**2.97/1.20**	**3.75/0.99**	**2.95/1.7**	**4.55/1.87**	**0.72/0**

* Includes 0.01/0.05 acre of impacts on CDFG habitat along edge of JPA creation area

Western Alternative

The western alternative will result in permanent impacts on 2.75 acres and temporary impacts on 1.05 acres of USACE and RWQCB jurisdictional areas. This includes permanent impacts on 0.82 acre and temporary impacts on 0.55 acre of wetland waters of the U.S. and permanent impacts on 1.93 acres and temporary impacts on 0.5 acre of adjacent wetlands.

The western alternative will also result in permanent impacts on 2.97 acres and temporary impacts on 1.2 acres of CDFG jurisdictional areas. This includes 0.82 acre of permanent impacts and 0.55 acre of temporary impacts on CDFG state streambed and 2.15 acre of permanent impacts and 0.65 acre of temporary impacts on CDFG riparian habitat.

Central Alternative

The central alternative will result in permanent impacts on 3.68 acre and temporary impacts on 0.93 acre of USACE and RWQCB jurisdictional areas. This includes permanent impacts on 1.49 acres and temporary impacts on 0.37 acre of wetland waters of the U.S. and permanent impacts on 2.19 acres and temporary impacts on 0.56 acre of adjacent wetlands.

The central alternative will also result in permanent impacts on 3.75 acres and temporary impacts on 0.99 acre of CDFG jurisdictional areas. This includes 1.49 acres of permanent impacts and 0.37 acre of temporary impacts on CDFG state streambed and 2.26 acres of permanent impacts and 0.62 acre of temporary impacts on CDFG riparian habitat.

Eastern Alternative

The eastern alternative will result in permanent impacts on 2.69 acres and temporary impacts on 1.67 acres of USACE jurisdictional areas. This includes permanent impacts on 1.07 acres and temporary impacts on 1.11 acres of wetland waters of the U.S., permanent impacts on 1.61 acres and temporary impacts on 0.55 acre of adjacent wetlands, and permanent impacts on 0.01 acre and temporary impacts on 0.01 acre of non-wetland waters of the U.S.

The eastern alternative will also result in permanent impacts on 2.95 acre and temporary impacts on 1.7 acres of CDFG jurisdictional areas. This includes 1.07 acres of permanent impacts and 1.11 acres of temporary impacts on CDFG state streambed and 1.88 acres of permanent impacts and 0.59 acre of temporary impacts on CDFG riparian habitat.

Roundabout Alternative

The roundabout alternative will result in permanent impacts on 4.23 acres and temporary impacts on 1.83 acres of USACE and RWQCB jurisdictional areas. This includes permanent impacts on 1.11 acres and temporary impacts on 1.14 acres of wetland waters of the U.S., permanent impacts on 3.11 acres and temporary impacts on 0.68 acre of adjacent wetlands, and permanent impacts on 0.01 acre and temporary impacts on 0.01 acre of non-wetland waters of the U.S.

The roundabout alternative will also result in permanent impacts on 4.55 acres and temporary impacts on1.87 acres of CDFG jurisdictional areas. This includes 1.11 acres of permanent impacts and 1.14 acres of temporary impacts on CDFG state streambed and 3.44 acres of permanent impacts and 0.73 acre of temporary impacts on CDFG riparian habitat.

Joint Powers Authority Mitigation Area

The JPA mitigation area creation will result in permanent impacts on 0.72 acre of CDFG jurisdictional riparian habitat. The JPA mitigation area will not impact USACE/RWQCB jurisdictional areas.

Chapter 5
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Appendix A
Figures

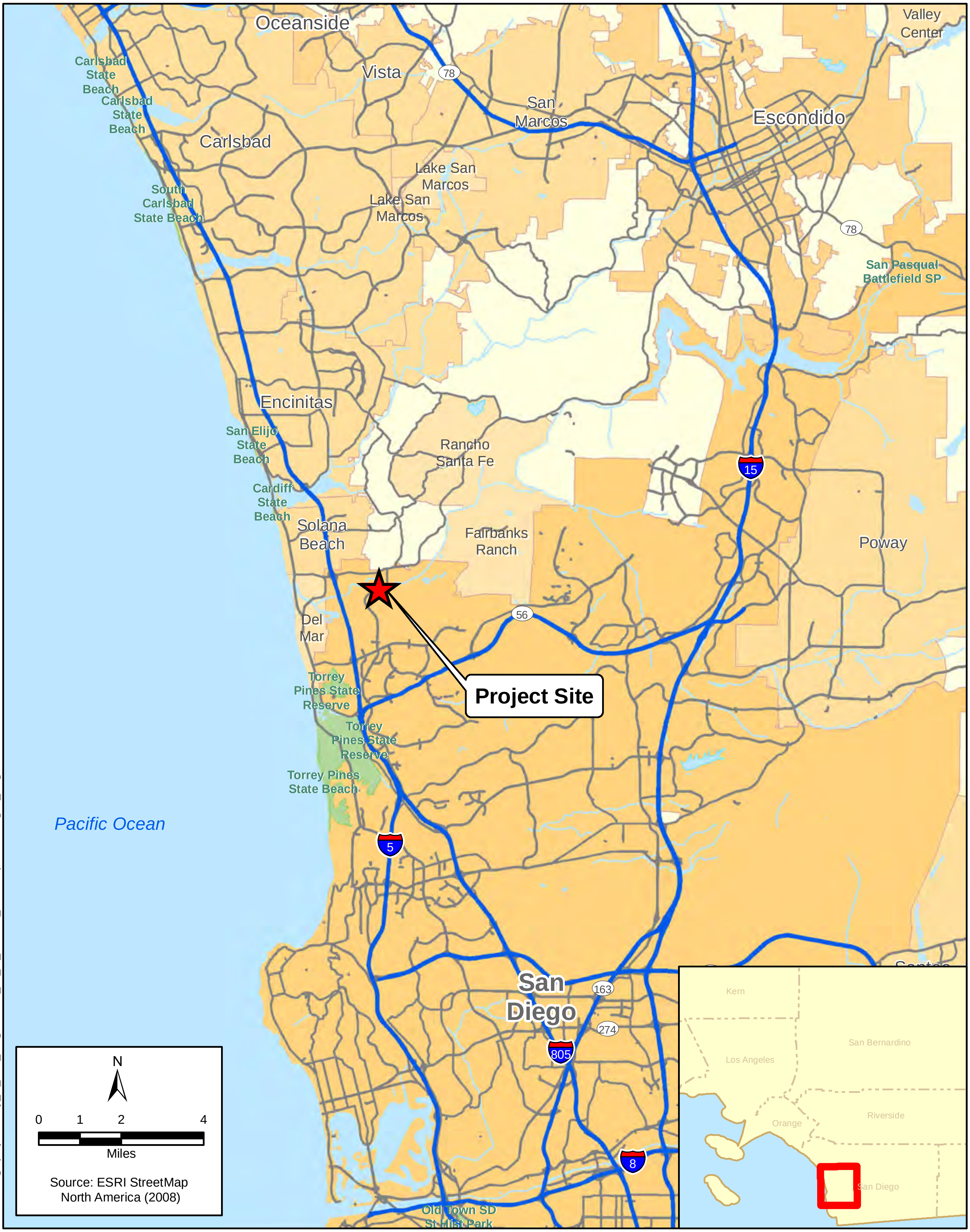

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Figure 1
Regional Vicinity
Preliminary Jurisdictional Delineation for the El Camino Real Bridge Replacement Project

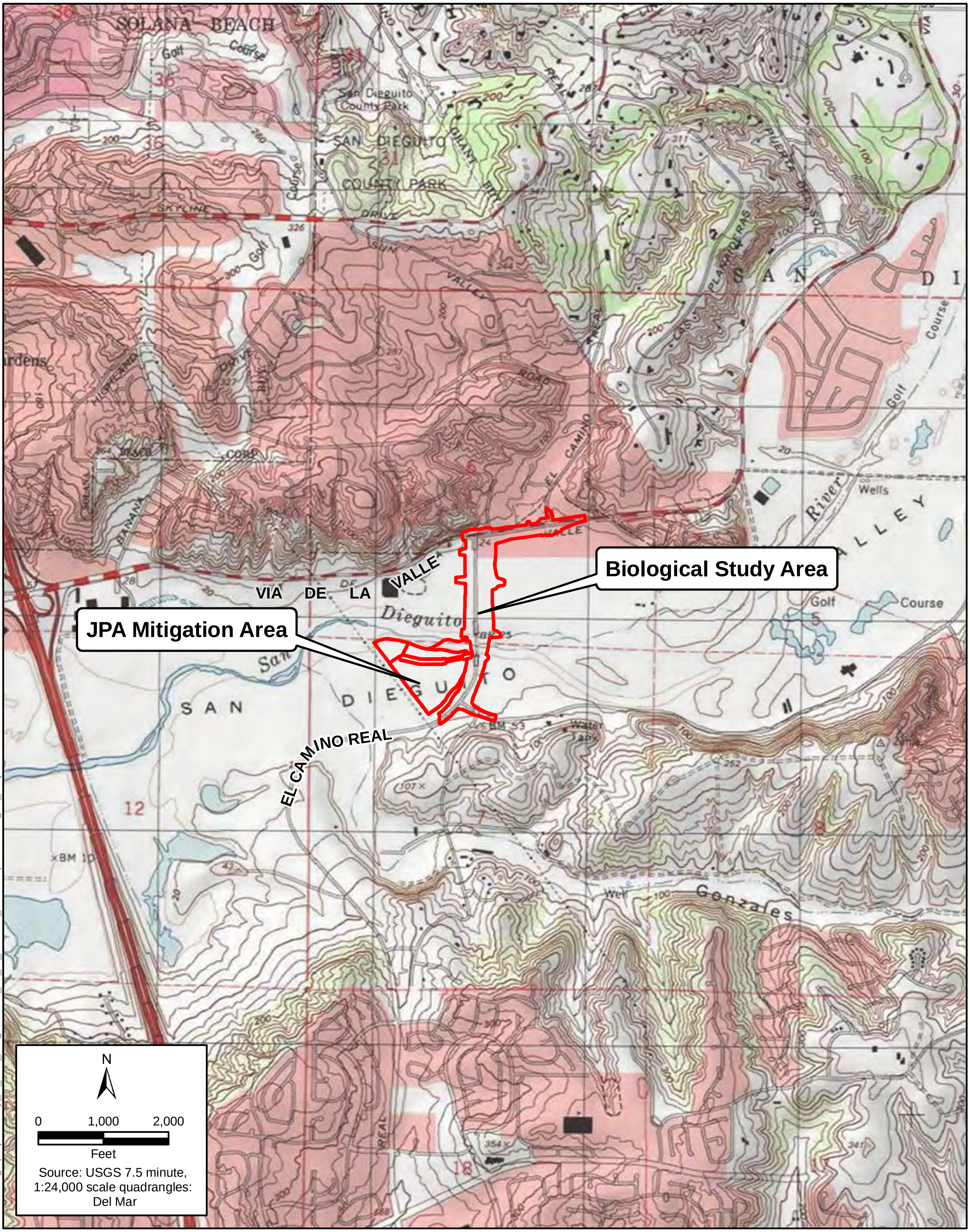

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Figure 2
Project Location
Preliminary Jurisdictional Delineation
for the El Camino Real Bridge Replacement Project

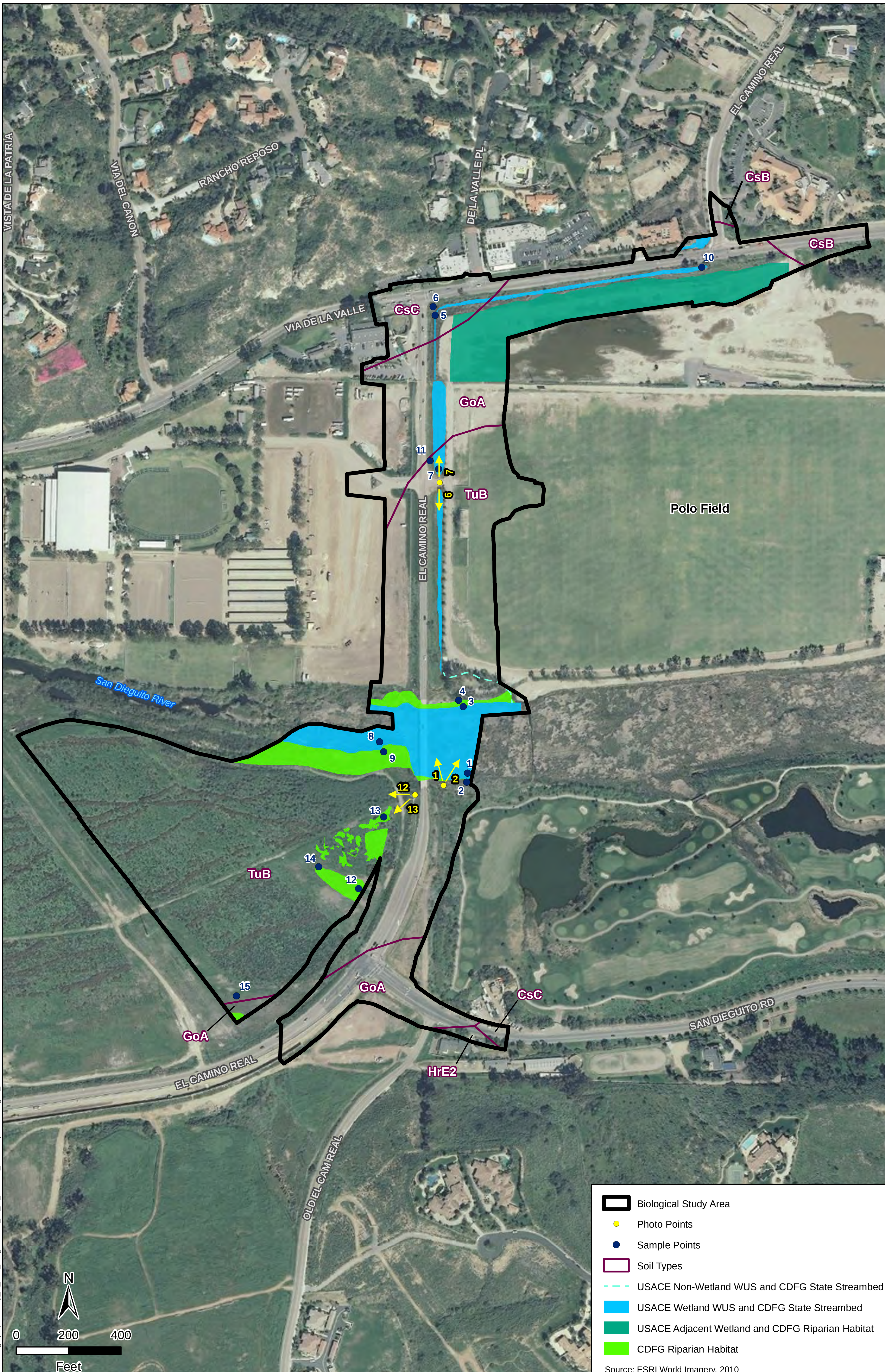

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Figure 3
Jurisdictional Areas Biological Study Area
Preliminary Jurisdictional Delineation for the El Camino Real Bridge Replacement Project

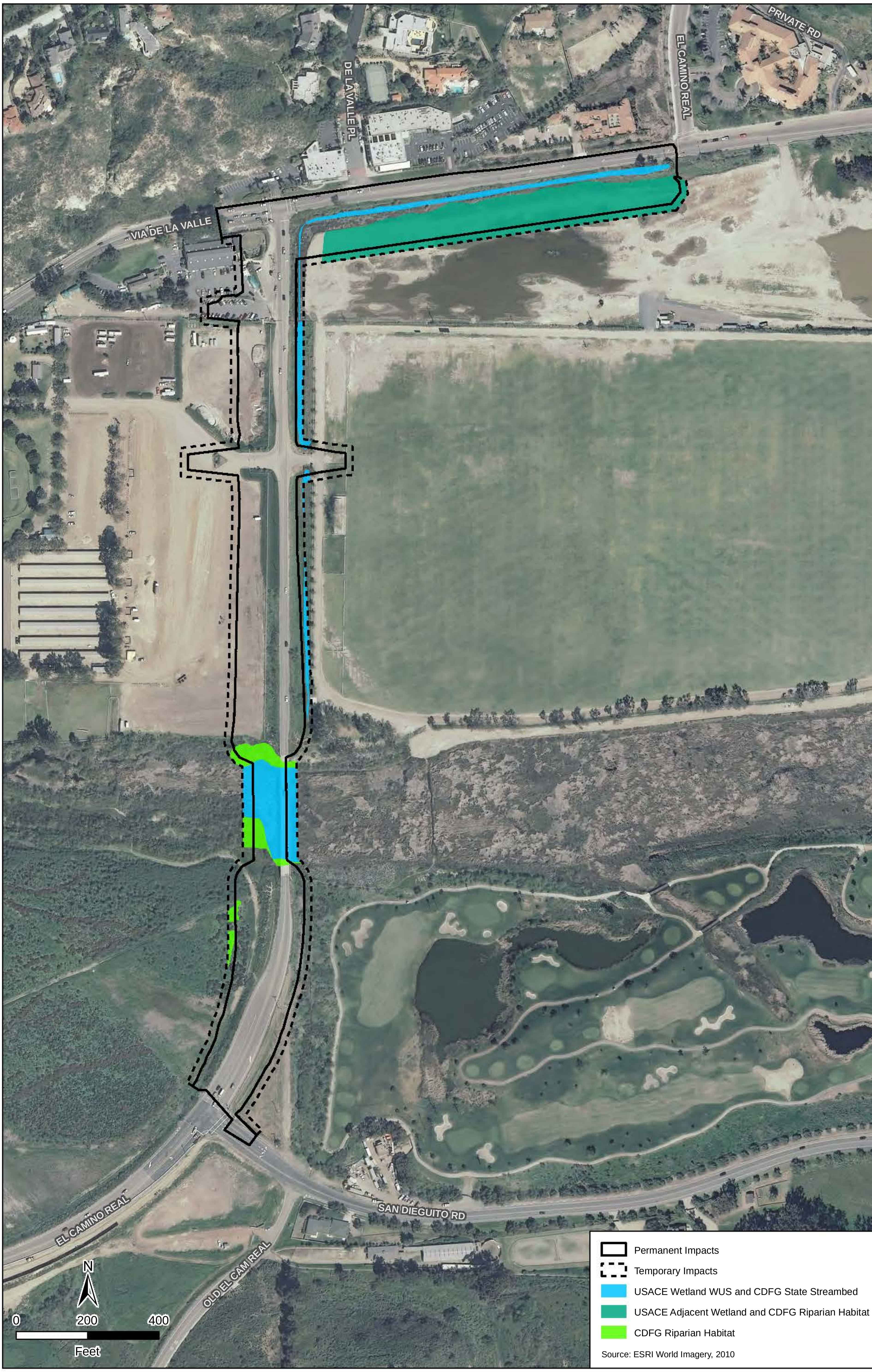

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Figure 4
Jurisdictional Areas Western Alternative
Preliminary Jurisdictional Delineation for the El Camino Real Bridge Replacement Project

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Figure 5
Jurisdictional Areas Central Alternative
Preliminary Jurisdictional Delineation for the El Camino Real Bridge Replacement Project

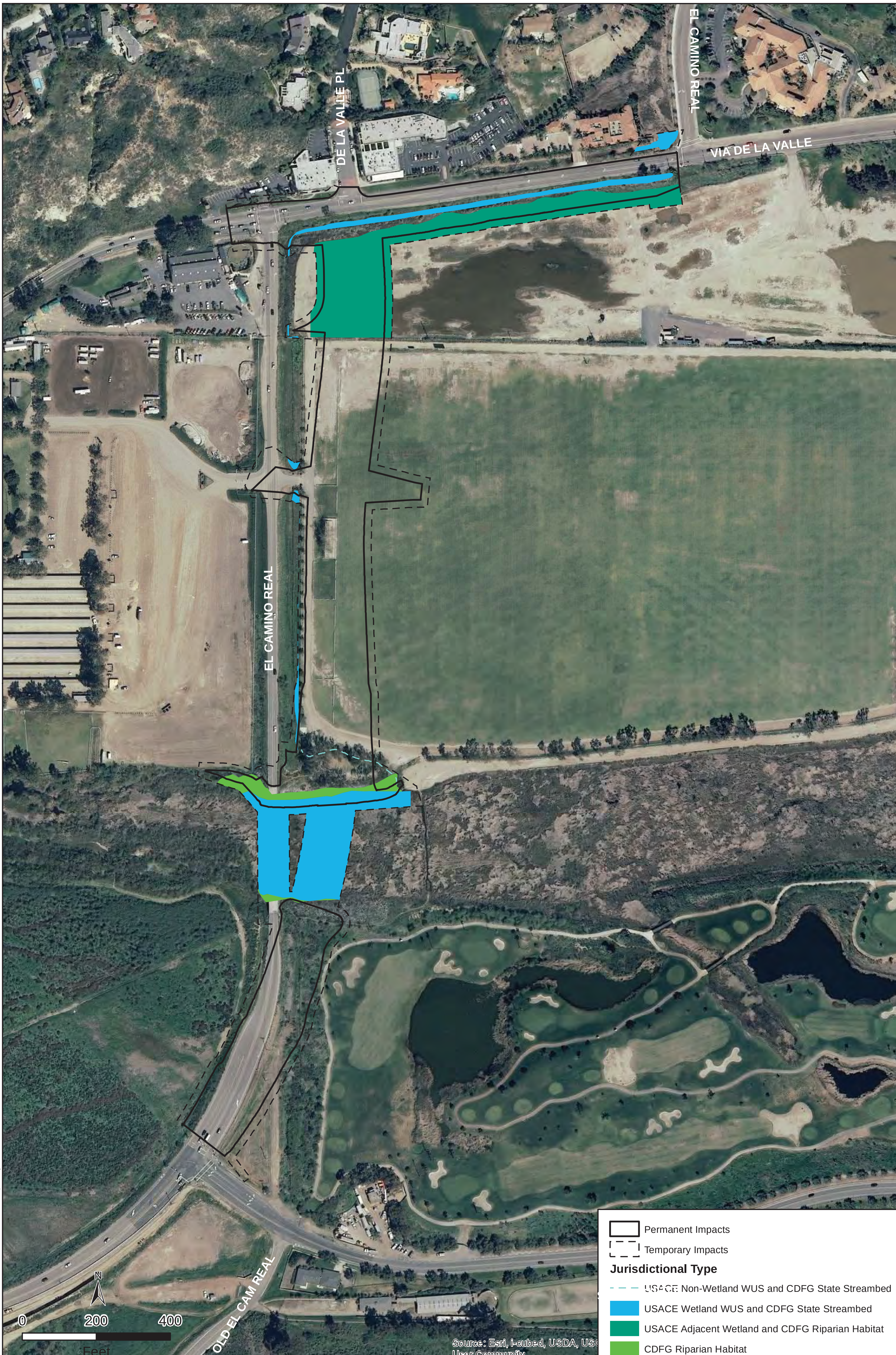

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Figure 6

Jurisdictional Areas Eastern Alternative

Preliminary Jurisdictional Delineation for the El Camino Real Bridge Replacement Project

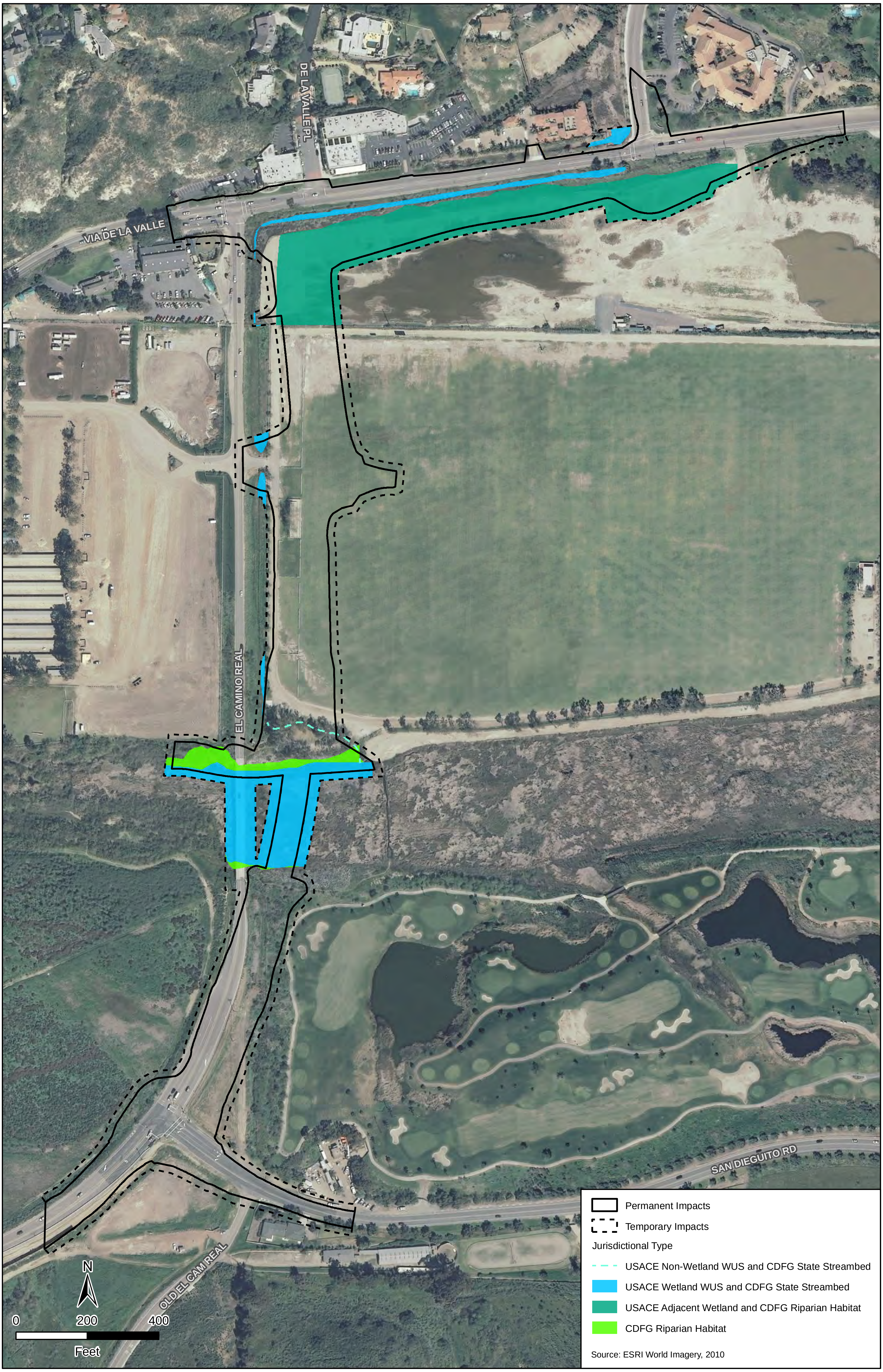

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Figure 7
Jurisdictional Areas Roundabout Alternative
Preliminary Jurisdictional Delineation for the El Camino Real Bridge Replacement Project

ICF INTERNATIONAL

Figure 8
Jurisdictional Areas JPA Mitigation Area
Preliminary Jurisdictional Delineation for the El Camino Real Bridge Replacement Project

Appendix B
Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: EL CAMINO REAL City/County: SAN DIEGO Sampling Date: 8-25-09

Applicant/Owner: CITY OF SD State: CA Sampling Point: SP-1

Investigator(s): ANDREW BORCHER Section, Township, Range: 7, 14S, 3W

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): CONCAVE Slope (%): 0-1

Subregion (LRR): —— Lat: 32.177685 Long: 117.229989 Datum: NAD83

Soil Map Unit Name: —— NWI classification: ——

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No —— (If no, explain in Remarks.)

Are Vegetation ——, Soil ——, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes X No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ______	Is the Sampled Area within a Wetland? Yes X No ______
Hydric Soil Present?	Yes X No ______	
Wetland Hydrology Present?	Yes X No ______	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Tamarisk ramosissima	10	N	FAC
2. Salicornia virginica	60	Y	OBL
3. Frankenia grandiflora	30	Y	FACW+
4. Typha latifolia	20	Y	OBL
5.			
Total Cover:	120		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum —— % Cover of Biotic Crust ——

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: ______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ______

Remarks:

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/2	80	10YR 5/6	5	C	M	CL	clay
3-12	10YR 2/1	60					SL	Sandy loam
	10YR 4/1	30	10YR 5/4	5	C	M	SCL	Silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

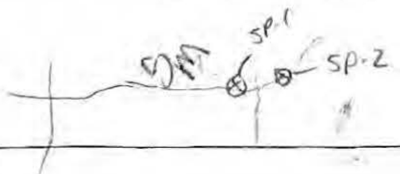
Field Observations:

Surface Water Present?	Yes ___	No ___	Depth (inches): ___
Water Table Present?	Yes ___	No ___	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 3

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: EL CAMINO REAL City/County: SAN DIEGO Sampling Date: 8-25-09

Applicant/Owner: CITY OF SD State: CA Sampling Point: SP-2

Investigator(s): ANDREW BORCHER Section, Township, Range: 7, 14S, 3W

Landform (hillslope, terrace, etc.): SLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 2-4

Subregion (LRR): —— Lat: 32.977643 Long: 117.229994 Datum: NAD 83

Soil Map Unit Name: —— NWI classification: ——

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum			
1. Tamarisk ramosissima	15	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:	15		
Herb Stratum			
1. Ambrosia psilostachys	30	Y	FACW
2. Heliotropium curassavicum	30	Y	OBL
3. Hirschfeldia incana	10	Y	NI
4.			
5.			
6.			
7.			
8.			
Total Cover:	70		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

Y Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2		NONE				SCL	
10→below restrictive layer (rip rap)								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ____________

Water Table Present? Yes ____ No ____ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____________

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: EL CAMINO REAL City/County: SAN DIEGO Sampling Date: 8-25-09

Applicant/Owner: CITY OF SD State: CA Sampling Point: SP-3

Investigator(s): ANDREW BORCHER Section, Township, Range: 6, 14S, 3W

Landform (hillslope, terrace, etc.): bench Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): — Lat: 32.178408 Long: 117.224959 Datum: NAD83

Soil Map Unit Name: — NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum			
1. Baccharis salicifolia	30	Y	FACU
2. Tamarisk ramosissima	15	Y	FAC
3. Salicornia virginica	20	Y	OBL
4.			
5.			
Total Cover:	65		
Herb Stratum			
1. Distichlis spicata	75	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	75		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum / % Cover of Biotic Crust /

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

Y Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	90	2.5YR 5/6	4	C	M	CL	
6-14	GLEY 1 3/10Y	60%					SCL	gritty clay loam
	10YR 5/2	40%	10YR 5/6	2	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SP-3

riprap

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: EL CAMINO REAL City/County: SAN DIEGO Sampling Date: 8-25-09

Applicant/Owner: CITY OF SD State: CA Sampling Point: SP-4

Investigator(s): ANDREW BORCHER Section, Township, Range: 6, 14S, 3W

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 2-4

Subregion (LRR): ——— Lat: 32.97847 Long: 117.230066 Datum: NAD83

Soil Map Unit Name: ——— NWI classification: ———

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum			
1. Baccharis salicifolia	30	Y	FACW
2.			
3.			
4.			
5.			
Total Cover:	30		
Herb Stratum			
1. Ambrosia psilostachys	40	Y	FACW
2. Hirschfeldia incana	10	Y	NI
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	50		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- Y Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 5/2		NONE				Sand	Sand piled on riprap
10 → below riprap								* May have been placed for erosion

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ______

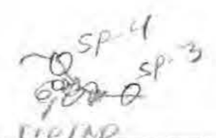
Water Table Present? Yes ___ No ___ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ______

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: EL CAMINO REAL City/County: SAN DIEGO Sampling Date: 8-25-09

Applicant/Owner: CITY OF SD State: CA Sampling Point: SP-5

Investigator(s): ANDREW BORCHER Section, Township, Range: 6, 14S, 3W

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): CONCAVE Slope (%): 0

Subregion (LRR): ______ Lat: 32.182578 Long: 117.230292 Datum: NAD83

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Isocoma menziesii	20	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:	20		
Herb Stratum			
1. Cyperus esculentus	30	Y	FACW
2. Chenopodium album	15	Y	FAC
3. Apium graveolens	20	Y	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	65		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ______ % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

Y Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: SP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 1 inch

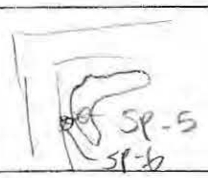
Water Table Present? Yes X No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: EL CAMINO REAL City/County: SAN DIEGO Sampling Date: 8-25-09

Applicant/Owner: CITY OF SD State: CA Sampling Point: SP-6

Investigator(s): ANDREW BORCHER Section, Township, Range: 6, 14S, 3W

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): concave Slope (%): 2-6

Subregion (LRR): — Lat: 32.982586 Long: 117.230306 Datum: NAD83

Soil Map Unit Name: NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland?	Yes ____ No X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Nicotiana glauca	5	Y	FAC
2. Kochia californica	20	Y	FAC
3.			
4.			
5.			
Total Cover:	25		
Herb Stratum			
1. Potentilla anserina	10	N	FACW
2. Heliotropium curassavicum	30	Y	OBL
3. Chenopodium album	20	Y	FAC
4.			
5.			
6.			
7.			
8.			
Total Cover:	60		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum — % Cover of Biotic Crust —

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: SP-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2		NONE				CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ______

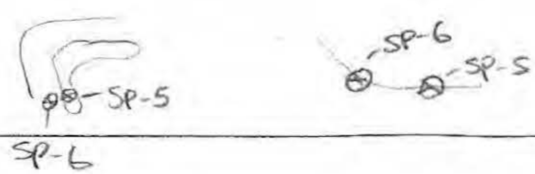
Water Table Present? Yes ______ No ______ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ______ Depth (inches): ______

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: EL CAMINO REAL City/County: SAN DIEGO Sampling Date: 8-25-09

Applicant/Owner: CITY OF SD State: CA Sampling Point: SP-7

Investigator(s): ______ Section, Township, Range: 6, 14S, 3W

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): ______ Lat: 32.980842 Long: 117.230248 Datum: NAD83

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum			
1. Distichlis spicata	100%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum ______ % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: SP-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100	NONE				SCL	
6-12	10YR 3/2	95	10YR 5/6	1%	C	RC	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ________

Water Table Present? Yes ____ No ____ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ________

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: El Camino Real Bridge City/County: San Diego Sampling Date: 8/16/2011

Applicant/Owner: City of San Diego State: CA Sampling Point: 7

Investigator(s): Dale Ritenour Section, Township, Range: S T14S R3W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: TuB Tujunga sand 0-5% NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Y No ___ (If no, explain in Remarks.)

Are Vegetation Y, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes Y No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes Y No ___	Is the Sampled Area within a Wetland? Yes Y No ___
Hydric Soil Present?	Yes Y No ___	
Wetland Hydrology Present?	Yes Y No ___	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Paspalum distichum	90	Y	OBL
2. Chenopodium album	5	N	FAC
3. Plantago major	2	N	FACW
4. Ambrosia psilostachya	<1	N	FAC
5. Cotula coronipifolia	<1	N	FACW
6.			
7.			
8.			
Total Cover:	95		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes Y No ___

Remarks:
Area appears to have been maintained by mowing

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5yr 3/1	90	7.5yr 4/6	10	C	PL/RC	loam Scl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes Y No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ____

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Wetland Hydrology Present? Yes Y No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
nearby surface water (12' horizontally + 6" vertically) in August

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: EL CAMINO REAL City/County: SAN DIEGO Sampling Date: 8-25-09

Applicant/Owner: CITY OF SAN DIEGO State: CA Sampling Point: SP-8

Investigator(s): ANDREW BORCHER Section, Township, Range: 7, 14S, 3W

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): Concave Slope (%): 0 - 1

Subregion (LRR): — Lat: 32.97803 Long: 117.230926 Datum: NAD83

Soil Map Unit Name: — NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___	
Hydric Soil Present? Yes X No ___		
Wetland Hydrology Present? Yes X No ___		

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Salicornia virginica	70%	Y	OBL
2. Tamarisk ramosissima	50%	Y	FAC
3.			
4.			
5.			
Total Cover:	120		
Herb Stratum			
1. Cyperus esculentus	20%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	20		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum — % Cover of Biotic Crust —

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SALT MARSH

SOIL

Sampling Point: SP-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5YR 3/1	100	NONE				SAND	
3-12	10YR 2/1	80	10YS 5/6	2	C	M	SL	
	2.5YR 3/1	20					SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ______

Water Table Present? Yes ___ No ___ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: EL CAMINO REAL City/County: SAN DIEGO Sampling Date: 8-25-09

Applicant/Owner: CITY OF SD State: CA Sampling Point: SP-9

Investigator(s): ANDREW BORCHER Section, Township, Range: 7, 14S, 3W

Landform (hillslope, terrace, etc.): — Local relief (concave, convex, none): Flat Slope (%): 0-1

Subregion (LRR): — Lat: 32.977188 Long: 117.230906 Datum: NAD83

Soil Map Unit Name: — NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum			
1. Isocoma menziesii	35	Y	FAC
2. Tamarisk ramosissima	30	Y	FAC
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Hirschfeldia incana	30	Y	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	30		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: SP-9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2		NONE				SCL	—

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ________

Water Table Present? Yes ____ No ____ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ________

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: EL CAMINO REAL City/County: SAN DIEGO Sampling Date: 8-25-09

Applicant/Owner: CITY OF SAN DIEGO State: CA Sampling Point: SP-10

Investigator(s): ANDREW BORCHER Section, Township, Range: 6, 14S, 3W

Landform (hillslope, terrace, etc.): DEPRESSION Local relief (concave, convex, none): CONCAVE Slope (%): 0

Subregion (LRR): ______ Lat: 32.983086 Long: 117.226893 Datum: NAD83

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum			
1. Chenopodium album	60	Y	fac
2. Ambrosia psilostachys	10	N	FACW
3. Ricinus communis	25	Y	FACU
4.			
5.			
6.			
7.			
8.			
Total Cover:	95		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ______ % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

Y Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL Sampling Point: SP-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	80	10YR 5/6	5	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR C**)
- __ 1 cm Muck (A9) (**LRR D**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR C**)
- __ 2 cm Muck (A10) (**LRR B**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- __ Drift Deposits (B3) (**Nonriverine**)
- __ Surface Soil Cracks (B6)
- __ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Biotic Crust (B12)
- __ Aquatic Invertebrates (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Oxidized Rhizospheres along Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Plowed Soils (C6)
- __ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- __ Water Marks (B1) (**Riverine**)
- __ Sediment Deposits (B2) (**Riverine**)
- __ Drift Deposits (B3) (**Riverine**)
- __ Drainage Patterns (B10)
- __ Dry-Season Water Table (C2)
- __ Thin Muck Surface (C7)
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Shallow Aquitard (D3)
- __ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ____

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SP-10

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: El Camino Real Bridge City/County: San Diego Sampling Date: 8/16/2011
Applicant/Owner: City of San Diego State: CA Sampling Point: 11
Investigator(s): Dale Ritenour Section, Township, Range: 5 T14S R3W
Landform (hillslope, terrace, etc.): road-shoulder Local relief (concave, convex, none): concave Slope (%): 15
Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______
Soil Map Unit Name: TvB - Tujunga sand 0-5% - Floodplain NWI classification: ______
Are climatic / hydrologic conditions on the site typical for this time of year? Yes Y No ____ (If no, explain in Remarks.)
Are Vegetation Y, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes Y No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No No	Is the Sampled Area within a Wetland? Yes ____ No No
Hydric Soil Present?	Yes ____ No NO	
Wetland Hydrology Present?	Yes ____ No No	

Remarks:
up slope from point 7

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Cynodon dactylon	50	Y	UPL(?)
2. Heliotropium carrasavicum	30	Y	FACW
3. Ambrosia psilostachya	10	N	FAC
4. Lactuca serriola	2	N	FAC
5. Polygonum aviculare	10	N	FAC
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No ____

Remarks:
Area may be maintained by mowing

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5yr 3/1	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ___________

Depth (inches): ___________

Hydric Soil Present? Yes ______ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ___________

Water Table Present? Yes ______ No ______ Depth (inches): ___________

Saturation Present? (includes capillary fringe) Yes ______ No ______ Depth (inches): ___________

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
above OHWM

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: El Camino Real Bridge City/County: San Diego Sampling Date: 1/26/2010

Applicant/Owner: City of San Diego State: CA Sampling Point: SP12

Investigator(s): Dale Ritenour Section, Township, Range: 7 14S 3W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): convex Slope (%): 0

Subregion (LRR): ____ Lat: 32.976124 Long: -117.231146 Datum: NAD83

Soil Map Unit Name: TuB - Tujunga sand NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Y No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? N Are "Normal Circumstances" present? Yes Y No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes Y No ____	Is the Sampled Area within a Wetland? Yes ____ No NO
Hydric Soil Present?	Yes ____ No N	
Wetland Hydrology Present?	Yes ____ No N	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover	0		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		
Herb Stratum (Plot size: 5')			
1. Rumex crispus	75	Y	FACW
2. Epil. cili	5	N	FACW
3. Dist spic	25	Y	FACW
4. Polyp. monsp.	5	N	FACW
5.			
6.			
7.			
8.			
= Total Cover	90		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes Y No ____

Remarks:

SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10 yr 3/2	100	—				loam	
12-16	10 yr 3/2	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5) 2:0

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ______

Water Table Present? Yes ___ No ___ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ______

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: El Camino Real Road Bridge City/County: San Diego Sampling Date: 1/26/2012

Applicant/Owner: City of San Diego State: CA Sampling Point: 13

Investigator(s): Dale Ritenour Section, Township, Range: 7 14S 3W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): flat Slope (%): 0

Subregion (LRR): ______ Lat: 32.977250 N Long: -117.230809 Datum: ______

Soil Map Unit Name: TuB- Tujunga Sands NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? N Are "Normal Circumstances" present? Yes Y No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______ No No	Is the Sampled Area within a Wetland? Yes ______ No No
Hydric Soil Present?	Yes ______ No No	
Wetland Hydrology Present?	Yes ______ No No	

Remarks: Area is within mule fat scrub but is not a wetland

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. —			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Bac sal	50	Y	FACW
2. Nicotiana glauca	25	Y	UPL
3. Isocoma menziesii	5	N	FAC
4.			
5.			
	75 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Urti urens	25	Y	UPL
2. Hord. muri.	30	Y	UPL
3. Sals. tragus	10	N	UPL
4. Hirsh incana	15	N	UPL
5.			
6.			
7.			
8.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1. —			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum ______ % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

N Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No X

Remarks:

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-15	10yr 3/2	100	—				loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR C**)
- __ 1 cm Muck (A9) (**LRR D**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR C**)
- __ 2 cm Muck (A10) (**LRR B**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes ____ No N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1) (**Nonriverine**)
- __ Sediment Deposits (B2) (**Nonriverine**)
- __ Drift Deposits (B3) (**Nonriverine**)
- __ Surface Soil Cracks (B6)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Biotic Crust (B12)
- __ Aquatic Invertebrates (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Oxidized Rhizospheres along Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Tilled Soils (C6)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- __ Water Marks (B1) (**Riverine**)
- __ Sediment Deposits (B2) (**Riverine**)
- __ Drift Deposits (B3) (**Riverine**)
- __ Drainage Patterns (B10)
- __ Dry-Season Water Table (C2)
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Shallow Aquitard (D3)
- __ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ____

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No N

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: El Camino Real Rd Bridge City/County: San Diego Sampling Date: 1/26/2012

Applicant/Owner: City of San Diego State: ______ Sampling Point: 14

Investigator(s): Dale Ritenour Section, Township, Range: 7 14S 3W

Landform (hillslope, terrace, etc.): flat - floodplain Local relief (concave, convex, none): Convex Slope (%): 0

Subregion (LRR): ______ Lat: 32.976676 Long: -117.231692 Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	Is the Sampled Area within a Wetland? Yes ____ No No
Hydric Soil Present?	Yes ____ No No	
Wetland Hydrology Present?	Yes ____ No No	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
= Total Cover	0		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		
Herb Stratum (Plot size: 5')			
1. Rum cri	5	Y	FACW
2. Con can	5	Y	UPL
3.			
4. Pol mon	20	Y	FACW
5. Car pyc	2	N	UPL
6. Ero cic	1	N	UPL
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover	0		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

Y Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes Y No ____

Remarks:

SOIL

Sampling Point: 1U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	10 yr 3/2	100	—				loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No N

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: El Camino Real Bridge City/County: San Diego Sampling Date: 1/26/2012

Applicant/Owner: City of San Diego State: CA Sampling Point: 15

Investigator(s): Dale Ritenour Section, Township, Range: 7 14 S 3 W

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: 32.975117 Long: -117.232698 Datum: ______

Soil Map Unit Name: TuB Tujunga sand NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Y No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Y Are "Normal Circumstances" present? Yes Y No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? Y (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes Y	No ______	Is the Sampled Area within a Wetland? Yes ______ No No
Hydric Soil Present?	Yes ______	No N	
Wetland Hydrology Present?	Yes ______	No N	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1. —			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1. —			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1. Frank. salina	90	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	______ = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust —

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

Y Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes Y No ______

Remarks:

SOIL

Sampling Point: 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	10 yr 3/2	100	—				loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ______

Water Table Present? Yes ___ No ___ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ______

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix C
Feature Photographs

	Photograph 1	El Camino Real Road Bridge over San Dieguito River. Facing north. August 2011.
	Photograph 2	Overview of San Dieguito River from south side of El Camino Real Road Bridge. Sample Points 1 and 2 were conducted in the foreground. August 2011. Facing east.
	Photograph 3	Sample Point 1. Edge of freshwater marsh along San Dieguito River. USACE jurisdictional wetland WUS and CDFG State Streambed. August 2009.

Photograph 4 Sample Point 2 outside of OHWM of San Dieguito River. August 2009.

Photograph 5 Sample Point 3 on edge of mule fat scrub and freshwater marsh on north side of the San Dieguito River. August 2009. Facing South.

Photograph 6 Looking south along El Camino Real from driveway to polo fields. Overview of the mowed USACE wetland WUS.

	Photograph 7	Looking north along El Camino Real from driveway to Polo fields, of the mowed USACE wetland WUS. Location of Sample Points 7 and 11 in the foreground.
	Photograph 8	Sample Point 7 in USACE wetland WUS and CDFG State Streambed. Wetland vegetation, soils, and hydrology present. Facing south.
	Photograph 9	Sample Point 11. Adjacent to Sample Point 7 and above the level of hydric soils. Facing south. August 2011.

Photograph 9 Sample Point 6 in narrow strip of wetland vegetation surrounded by upland vegetation. August 2009.

Photograph 10 Sample Point 10. August 2009.

Photograph 11 Overview of JPA mitigation area. Enhancement Area in background to right. Creation area in background to left. Sample Point 13 in center. Taken from just south of El Camino Real Bridge. Facing east. August 2011.

Photograph 12 Overview of JPA mitigation area. Taken from just south of El Camino Real Bridge. Facing southeast. August 2011

Appendix E
San Dieguito W19 Restoration Site Wetland Delineation Report

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SAN DIEGUITO W19 RESTORATION SITE
Wetland Delineation Report

Sue Scatolini, District 11 Biologist
4050 Taylor Street
San Diego, CA 92110

December 2013

Table of Contents

INTRODUCTION

The San Diego Association of Governments (SANDAG) and the California Department of Transportation (Caltrans) in conjunction with the San Dieguito River Park Joint Powers Authority (JPA) and the City of San Diego proposes a restoration plan to mitigate for impacts associated with highway and transit improvements in the Interstate 5 North Coast and Los Angeles-San Diego (LOSSAN) Rail corridors, the El Camino Real Bridge Widening, as well as provide reserve wetlands for Southern California Edison. The study area consists of approximately 127 acres in the City of San Diego, east of I-5, south of County Highway S6, and west of El Camino Real (Figure 1). This project studies the feasibility of creating a 50-acre tidal wetland area defined as: salt marsh habitat, mudflat habitat, and open water (tidal) as well as creating a 15-acre fresh water wetland area defined as: freshwater marsh habitat and open water (fresh). This report details the delineation of Federal waters of the U.S. and wetlands and State of California waters and wetlands under the jurisdiction of the California Coastal Commission and/or the California Department of Fish and Wildlife.

Project Description

The proposed project is to re-establish approximately 50 acres of coastal salt marsh and 15 acres of freshwater marsh to mitigate for impacts associated with I-5 freeway and LOSSAN rail impacts within the North Coast Corridor and the El Camino Real Bridge Replacement Project. Restoration activities will take place within an area referred to as the "W19 restoration site" (Figure 2). Potential disposal sites (i.e., disposal sites A and B) have also been identified as part of the Project for materials (e.g., soil) disposal during restoration efforts within the W19 restoration site (Figure 2).

The Project site evaluated during the wetland delineation included the W19 restoration site and a 100-foot survey buffer around the site. The Project site is located within a shallow valley at the eastern end of San Dieguito Lagoon on the east side of I-5 and the west side of El Camino Real. Topography is generally flat, with an elevation ranging from approximately 14 to 22 feet above mean sea level (AMSL) at the W19 restoration site. According to the feasibility study, almost the entire W19 restoration site has been previously disturbed by agricultural activities (Dokken 2011). A notable exception is an approximately 100-foot wide SDG&E transmission corridor that traverses the W-19 site near its eastern boundary.

Purpose of Assessment

This assessment was completed to facilitate the wetland determination and permitting of Federal waters of the U.S. and State of California jurisdictional wetland impacts for San Dieguito W19 Restoration Site.

METHODOLOGY

Potential areas of jurisdiction were identified by reviewing site topography and by observation of vegetation types in the field. Each area of potential jurisdiction was first evaluated using the methodology in the Corps of Engineers Wetland Delineation Manual (US Army Corps of Engineers (ACOE) 1987) with the Arid West Guidelines (ACOE 2006). The routine determination for areas equal to or less than 5 acres was used. If no wetland vegetation was present, the site was evaluated for the extent of non-wetland waters of the US as defined by ACOE regulations. Field work was performed by Sue Scatolini and Chris Nordby on April 7, 2011 and July 10, 2013. Soils information is from the U.S. Department of Agriculture (USDA) Soil Survey, San Diego Area, California (Bowman 1973). The recently updated National Wetland Plant List for California (Lichvar 2012) was used to determine hydrophytic vegetation. Upon completion of the ACOE jurisdictional determination, the extent of State jurisdictional wetlands was based on the extent of the vegetation communities and high water levels or banks of drainages in non-vegetated areas that extended beyond the waters of the U.S. CDFW and CCC jurisdiction includes all ACOE jurisdictional wetlands and extends to the outer limits of the canopy of hydrophytic vegetation within or adjacent to a stream; or to the top of a stream bank for those instances where either vegetation was absent or the stream bank or hydrology extended beyond the limits of the wetland vegetation. Hydric soils are extremely rare in areas that do not exhibit hydrology or hydrophytic vegetation; therefore, soils outside of those areas were not examined.

Hydrophytic vegetation, hydrology, and hydric soils are all required to be present for an area to be considered a wetland by the ACOE. Only one of these three criteria is necessary for an area to be considered a wetland by the State of California. Hydrophytic vegetation is determined by the percentage of dominant plant species that are considered Facultative (FAC), Facultative Wetland (FACW), and Obligate (OBL) in an area (Cowardin et al. 1979). If more than 50 percent of the dominant species in an area are listed as FAC, FACW, and/or OBL, then the area has hydrophytic vegetation.

Hydrology is defined as all of the hydrological characteristics of an area that is periodically inundated or has saturated soils during the growing season (ACOE 1987). Some hydrologic characteristics are drainage patterns, saturated soils, inundation, sediment deposits, drift lines, and water marks. These characteristics indicate that an area has wetland hydrology.

Hydric soils are those that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor growth of hydrophytic vegetation (ACOE 1987). Hydric soils are determined by digging a soil pit and examining the soil for color, chroma, hue, reducing characteristics, and anaerobic characteristics that would indicate that the soils are hydric.

The ACOE methodology was used to determine when all three characteristics were present and therefore, a wetland was present. The topography and vegetation were examined at each site and obvious areas of wetland were identified. Wetland delineation samples were then taken near the interface of wetland vegetation and upland vegetation and/or where there was an obvious change in the slope (Figures 3a and 3b). Upon identification of the wetland boundary, the characteristics noted were used to extrapolate the remainder of the wetland with occasional samples taken to confirm the determination. ACOE and State of California delineation was completed within W19 and a 100-foot buffer area.

When one or more of the wetland characteristics were not present, the area was examined for presence of non-wetland waters of the U.S. If hydrophytic vegetation or hydric soils were not observed onsite, then evidence of an ordinary high water mark (OHWM) was examined. In addition, the source of water and where water flowed to was examined to determine if the drainage was carrying storm runoff to a storm drain or was carrying flow of a stream or creek to another jurisdictional area. If an area had hydrophytic vegetation, but no hydrology indicators this area was identified as a State wetland. Vegetation mapping was used to delineate these areas with hydrophytic vegetation or streambanks outside of the ACOE jurisdictional areas that were identified as State wetlands.

ENVIRONMENTAL SETTING

This project encompasses approximately 127 acres of land located between I-5, El Camino Real, and south of the San Dieguito River. The area was formerly used for agriculture and a portion of the site was also used in 2012 as a settling basin during dredging activities for the mouth of San Dieguito Lagoon. There are two existing transmission line corridors that currently cross through the 127-acre area.

Vegetation Communities

Twelve wetland communities were identified within the W19 project area and buffer (Figure 4). The vegetation communities generally follow the descriptions in Holland (1986); however, some of the communities either do not fit the Holland descriptions or there is little or no vegetation in the habitat.

<u>Southern Willow Scrub-Disturbed.</u> This community consists of dense, broadleaf, winter-deciduous riparian thickets dominated by willows (*Salix* spp.) and mulefat (*Baccharis salicifolia*) with scattered emergent cottonwood (*Populus fremontii*) and western sycamore (*Platanus racemosa*). Formerly extensive in coastal southern California, southern willow scrub is now estimated as reduced by 95 to 97 percent (Faber *et al.* 1989). This community is disturbed onsite due to the presence of invasive species such as tamarisk (*Tamarix ramosissima*), pampas grass (*Cortaderia jubata*) and ice plant (*Carpobrotus edulis*). The dominant native species within the habitat are arroyo willow (*Salix lasiolepis*) and mulefat with black willow (*Salix gooddingii*).

Mulefat Scrub. This vegetation type is completely dominated by mulefat, a tall (6.5 to 13.1 feet), perennial shrub. Very few other species are associated with this vegetation community. Mulefat scrub is an early successional community following periodic disturbance (Holland 1986). Repeated flooding of water channels allows the survival of this habitat type. Mulefat scrub is found in small patches near the San Dieguito River,

Freshwater Marsh. Freshwater marsh is dominated by perennial, emergent monocots 4.26 to 6.56 feet tall. Uniform stands of bulrushes (*Scirpus* spp.) or cattails (*Typha* spp.) often characterize this habitat. The soil in freshwater marshes is permanently saturated year-round with water and can support a high diversity of native and nonnative plant species. This community is found within the San Dieguito River channel immediately west, east, and under the El Camino Real Bridge.

Alkali Marsh. Alkali marsh habitat is dominated by alkali weed (*Cressa truxillensis*), wooly sea-blite (*Suaeda taxifolia*), and crystalline ice plant (*Mesembryanthemum crystallinum*). This habitat occurs in low salty areas primarily just north of El Camino Real Road that were not previously disturbed by agriculture..

Coastal Brackish Marsh. Coastal brackish marsh is characterized by halophytic species such as pickleweed (*Sarcocornia pacifica*), saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), and freshwater species such as cattails and bulrushes. Many wildlife species depend on this community for nesting and foraging habitat. This community is dominated by alkali heath, bulrush, tamarisk, and pickleweed. It is found in the narrow channel that carries water from the San Dieguito River south along the western transmission line.

Southern Coastal Salt Marsh. These areas are typically flooded during high tides or strong winter storms. Most plants in this community are low-growing, salt-tolerant succulents called halophytes. Among the common species are pickleweed, alkali heath, and saltgrass. Coastal salt marsh vegetation is very important for wildlife. Several rare and endangered species of birds (e.g., light-footed clapper rail [*Rallus longirostris levipes*], Belding's savannah sparrow [*Passerculus sandwichensis beldingi*]) and plants are dependent upon it for survival. Southern coastal salt marsh is found along the edges of the San Dieguito River and in the low areas surrounding the least tern nesting site.

Disturbed salt marsh is present in the remnant salt marsh west of the western transmission lines in a low area that ponds water. Disturbed salt marsh onsite is dominated by alkali heath, pickleweed, rabbitfoot grass (*Polypogon monspeliensis*), marsh mallow (*Malvella leprosa*), and five-hook (*Bassia hyssopifolia*).

Saltmarsh/Mulefat Scrub- Disturbed. This community is a mixture of two other communities. It has primarily salt marsh species in the understory with mulefat scattered throughout. Mulefat and a few arroyo willow and tamarisk were identified in the overstory and the understory is dominated by pickleweed, alkali heath, rabbitfoot grass, and yellow sweet clover (*Melilotus indica*).

Arrowweed Scrub. Arrowweed scrub forms in dense thickets along streams and rivers and is dominated by arrowweed (*Pluchea sericea*). This habitat is found at the northern end of the western transmission line corridor near the edge of the San Dieguito River.

Tamarisk Scrub. Tamarisk scrub is a weedy monoculture of any of several tamarisk species (*Tamarix* spp.). Tamarisk scrub onsite occurs along the edge of the disturbed southern willow scrub that grows on the edge of the San Dieguito River. Tamarisk scrub is bounded by tobacco tree scrub and disturbed coyote brush scrub where the habitat is drier.

Disturbed Wetland. Disturbed wetlands are communities that exhibit hydrology, hydric soils, and vegetation; however, the species found onsite are a combination of weedy, nonnative and native species that do not resemble the other wetland habitats. Species commonly found in disturbed wetlands onsite include willow herb (*Epilobium* spp.), curly dock (*Rumex crispus*), Bermuda grass (*Cynodon dactylon*) and five-hook. Disturbed wetland is found in a low area just west of El Camino Real and at the outlet of the culvert/wildlife crossing under El Camino Real.

Salt Marsh Transition. Salt marsh transition habitat is not a recognized vegetation community by Holland (1986). However, there is a distinct vegetation community found in areas between the southern coastal salt marsh community and upland vegetation where there is no tidal influence. Plants in this transition zone are salt tolerant and a combination of the two communities. Salt marsh transition onsite is dominated by a combination of species including wooly sea-blite, goldenbush, big saltbush (*Atriplex lentiformis*), crystalline ice plant, and rabbitfoot grass. Vegetation in this community is often sparsely distributed with salt flat areas in between plants. Salt marsh transition is found primarily where the settling basin was in 2012 onsite and south of the disturbed southern willow scrub at the southern end of the site.

Non-Vegetated Habitats

Open Water. Open water habitat is deeper water that is unvegetated or may have subtidal vegetation such as eelgrass. Open water habitat is considered jurisdictional waters of the U.S., but is not considered a wetland because it does not support a plant community. Open water is considered a State wetland. Open water habitat is important foraging and resting areas for many bird species and also provides important fish and invertebrate habitat. Open water is found in the San Dieguito River channel and in the small drainage channel that drains from the river to the south west of the western transmission line corridor.

Hydrology

Hydrology conditions within the project vicinity are dominated by the San Dieguito River, which flows along the northern edge of the project area. There are two small channels that carry tidal flow portions of the interior of the site. One is at the northwestern edge by the nesting island and the second is a linear channel that runs immediately west of the western transmission lines. A culvert that has also been converted into a wildlife crossing carries flow from south of El Camino Real into the site; however, flow disperses quickly onsite.

Soils

Soil information for the project vicinity was obtained from the USDA Soil Survey, San Diego Area, California (Bowman 1973). The majority of the site is mapped as following Tujunga sand; however this soil type was only observed in one of the test pits. The other soil mapped onsite is Grangeville sandy loam, which more closely resembles some of the soils onsite. The site has been used for agriculture in the past and the soil has been extensively amended. The majority of the soils in the project area are sandy clay loams. Most are a grayish brown color with a color of 10YR with a hue of 3 or 4 and a chroma of 1 to 3.

RESULTS

Jurisdictional Areas

The plant communities described above for the Study Area are based on those in Holland (1986) and are based on plant species composition. There are a few communities that are either unvegetated or do not match descriptions in Holland (1986) and the communities are based on descriptive characteristics. Within those plant communities may also be areas that meet the three criteria to be considered as jurisdictional wetlands by the ACOE. The ACOE regulates wetlands as defined in the ACOE Wetlands Delineation Manual (ACOE 1987) and Arid West Region Supplement (ACOE 2006), and waters of the US as defined in the Regulatory Programs of the ACOE; Final Rule (Fed Reg 1986). By ACOE definition wetlands are

> "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in the saturated soil conditions."

Waters of the US include natural drainages up to the limit of the ordinary high water mark, which is defined as the:

"line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas."

The CDFW only requires one of the three criteria that the ACOE requires in the definition of a wetland. Pursuant to CDFW Code 1602 a streambed alteration agreement is needed for projects which will:

divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit, use material from the streambeds designated by the department, or result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake designated by the department."

This generally includes all natural drainages, including any adjacent riparian habitat, but usually does not cover isolated wetlands.

The CCC defines wetlands similar to the CDFW. CCC Administrative Regulations (Section 13577(b)) further define a wetland as:

Wetlands are lands where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent or drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salt or other substance in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deepwater habitats.

There are CDFW, CCC, and ACOE jurisdictional wetlands within and around the site. CDFW and CCC jurisdiction is combined in the discussion of State wetlands. The wetland areas are discussed below.

ACOE Jurisdictional Wetlands and Waters of the U.S.

The site was surveyed and vegetation mapping was examined as well as site topography. Wetland delineation sample plots were collected in areas that appeared most likely to be wetlands and then additional plots were examined until the boundary of the wetland and adjacent upland were determined. The majority of the site did not exhibit hydrology and/or soils. ACOE jurisdictional areas were found along the San Dieguito River, the two drainage channels that connect to the river, at the culvert/undercrossing under El Camino Real, and in the remnant salt marsh.

Sample point 6 was located in a low area with consistent hydrophyic vegetation, hydric soils and hydrology and was identified as ACOE jurisdictional wetland (Figure 3b). This sample point was located at approximately the +6-foot (NGVD 29) elevation contour. The remainder of the wetland edge associated with the river was extrapolated to that contour which also corresponded with the appropriate habitat determined during vegetation mapping (Figure 5). The elevation increases rather abruptly from the +6-foot contour to form a berm along much of the site just south of the river.

ACOE jurisdictional wetlands were also identified in the two small drainage channels that flow from the river into the site by the western transmission lines and the nesting island (Figure 5). The only other area that was identified as ACOE jurisdictional wetland habitat was at the outfall of the culvert/wildlife crossing that flows under El Camino Real. Although this area did not exhibit soils, the area was recently excavated for placement of the larger box culvert/crossing and, thus, the soil had been recently disturbed (Figure 5). It is anticipated that soils will develop as water continues to flow to the area. Water flow is quickly dispersed and there is no connected drainage habitat.

The area that was the lowest point of the settling basin constructed by the SONGS Restoration Project to use during dredging of the mouth of the lagoon was determined not to be an ACOE jurisdictional wetland. Although the lowest point of the settling basin did exhibit all three criteria, hydrology indicators were identified as soil cracks. These cracks are due to long term ponding in the basin at this end and are not anticipated to persist without pumping more water onsite.

Table 2 summarizes the results of the delineation by sampling point. The locations of the sampling points are presented in Figures 3a and 3b.

Table 2. Summary of Wetland Delineation Sample Results

Sample #	Location	Vegetation	Soils	Hydrology	ACOE Wetland	State Wetland	Comment
1	Outside remnant salt marsh	Yes	Yes	No	No	Yes	The area is a mixture of mulefat and salt marsh species, it does have hydric soils, but no hydrologic indicators.
2	Edge remnant salt marsh	Yes	Yes	Yes	Yes	Yes	Area at edge of salt marsh with all three criteria
3	Middle remnant salt marsh	Yes	Yes	Yes	Yes	Yes	Area in the middle of salt marsh with all three criteria
4	Middle alkali marsh	Yes	Yes	No	No	Yes	Area is lower than surrounding habitat, but had no hydrology indicators.
5	Middle disturbed wetland	No	No	No	No	No	Although there were some FAC and FACW species, no vegetation, soil or hydrology indicators were identified.
6	Below berm at the edge of the river	Yes	Yes	Yes	Yes	Yes	Site down below berm in area with apparent wetland characteristics
7	On berm at the edge of the river	No	No	No	No	No	Site had some wetland species, but not dominant. No criteria observed.
8	In a low area inland of berm at the edge of the river	Yes	No	No	No	Yes	Low area on the upland side of berm along river. Had hydrophytic vegetation, but not soils or hydrology.
9	In flow area of culvert under El Camino Real	Yes	No	Yes	Yes	Yes	Point collected in middle of flow area of culvert. No soils observed; however recent construction likely disturbed soils. Site is an atypical situation and was determined to be a wetland.
10	Outside of flow area from Culvert	Yes	Yes	No	No	Yes	There is a ring of wetland around the flow area of the culvert. This point was taken where hydrologic indicators no longer occur.
11	Upstream end of drainage channel by western transmission line	Yes	Yes	No	No	Yes	This site was at the end of the drainage channel in the middle of the site. This point was where hydrology indicators no longer occur, identifying the edge of the wetland area.

12	In lowest portion of former settling basin	Yes	Yes	Yes*	No	Yes	The area does exhibit all three criteria, but is an atypical situation due to use of the area as a settling basin. Hydrology indicators are not anticipated to persist now that no more water is pumped onsite.
13	In patch of southern willow scrub	Yes	No	No	No	Yes	There is a depression with willows; however, no hydric soil or hydrology indicators.

State Wetlands

All the areas that were identified as ACOE jurisdictional habitat are also considered State wetlands. In addition, the areas where at least one of the wetland criteria were identified onsite are also considered State Wetlands. The amount of State wetland outside of these sampling locations was then extrapolated based on vegetation to identify the extent of state wetlands based on the dominance of hydrophytic vegetation (Figure 4). The State wetlands occur primarily along the San Dieguito River, in the remnant salt marsh, and in small patches of alkali marsh that occur in lower areas that have salty soils and are dominated by salt tolerant wetland species (Figure 6). The remainder of the site is primarily disturbance related vegetation with many exotic species. The wetlands onsite are primarily disturbed, with the exception of those along the edge of the river (Figure 6).

DISCUSSION

The San Dieguito W19 Restoration Project is still in the planning stages. The project proposes to re-establish approximately 50 acres of salt marsh and 15 acres of fresh water marsh as well as create and enhance southern willow scrub and mulefat scrub habitats as mitigation for impacts associated with the El Camino Real Bridge Replacement Project. The majority of the wetlands identified along the San Dieguito River and existing channels will either be left as is, or may have some restoration work esuch as weeding or minimal grading associated with it. The waters of the U.S. and state wetlands in the interior of the site will be graded down and replanted with native salt marsh and brackish marsh species. There will be a large net increase in both wetland area and functions and services. The alternatives have not been fully identified at this point. Impacts will be determined by the Project environmental document based on the information in this report.

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Legend

San Dieguito W19 Restoration Site

N

Figure 1. Project Location

Figure 2. San Dieguito W19 Restoration Site

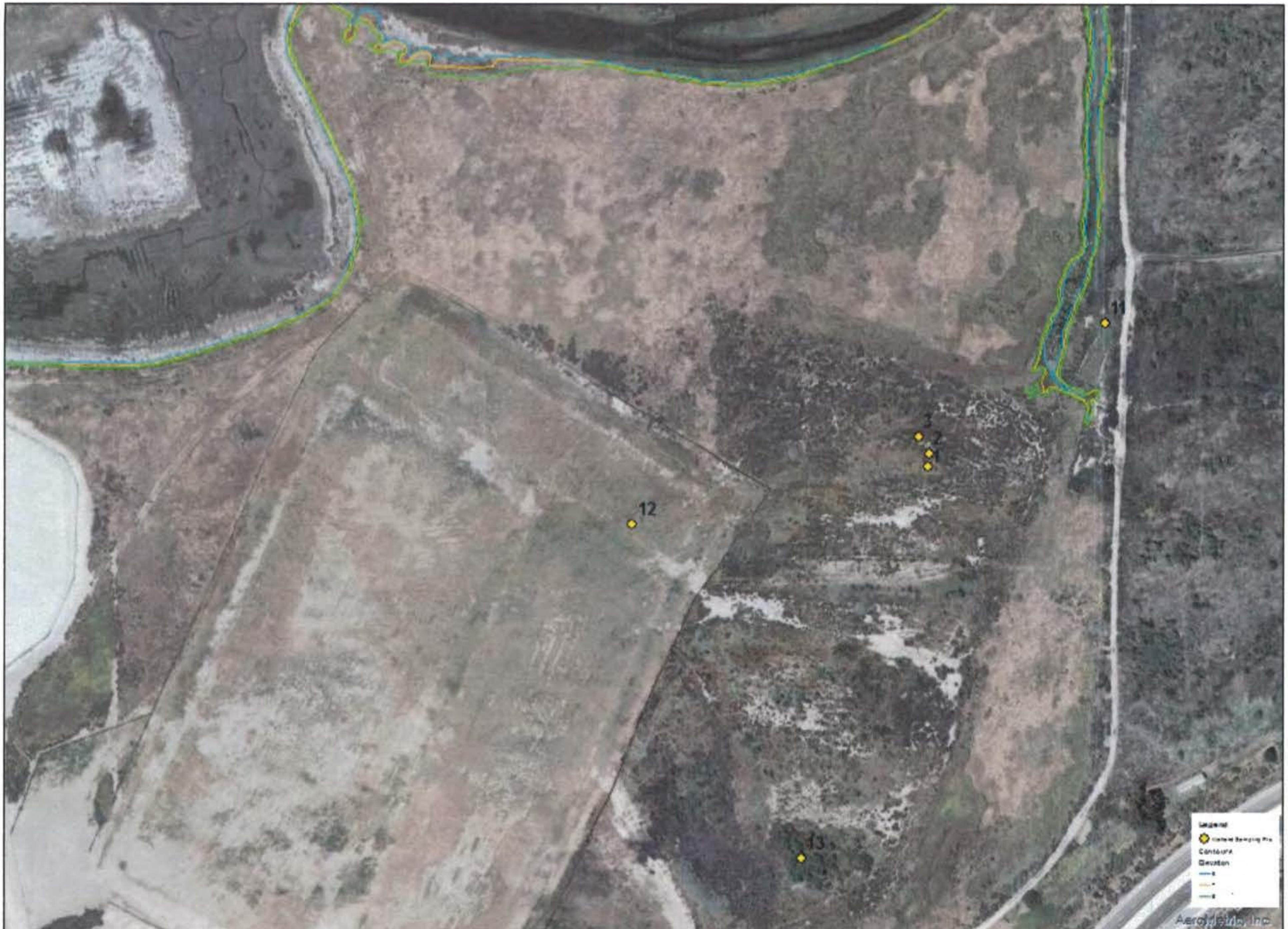

Figure 3a. Wetland Sample Points at the San Dieguito W19 Restoration Site

Figure 3b. Wetland Sample Points at the San Dieguito W19 Restoration Site

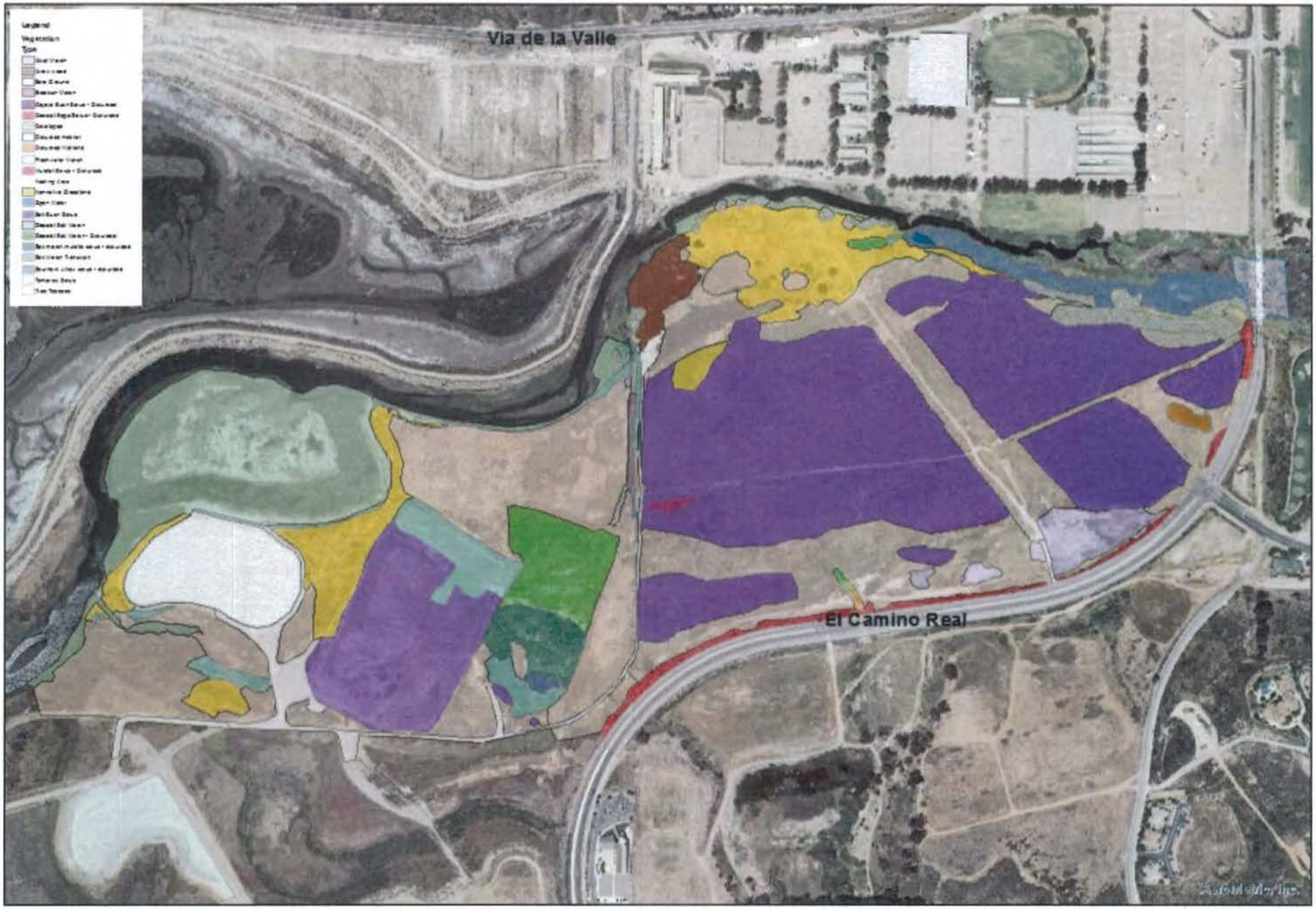

Figure 4. Vegetation Communities at San Dieguito W19 Restoration Site

Figure 5. ACOE Jurisdictional Waters of the U.S. at the San Dieguito W19 Restoration Site

Figure 6. State Wetlands at the San Dieguito W19 Restoration Site

Appendix A

Wetland Delineation Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site City/County: San Diego/San Diego Sampling Date: 4/7/11

Applicant/Owner: SANDAG State: CA Sampling Point: 1

Investigator(s): Sue Scatolini, Chris Nordby Section, Township, Range: 14S 12R Sect 7, 12

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C Lat: 32.9749 Long: -117.2396 Datum: ____

Soil Map Unit Name: Tujunga sand NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. ____	____	____	____
2. ____	____	____	____
3. ____	____	____	____
4. ____	____	____	____
50% = ____, 20% = ____	____	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. *Tamarix ram*	1	no	FAC
2. *Baccharis salicifolia*	5	yes	FAC
3. *Salix lasiolepis*	2	yes	FACW
4. ____	____	____	____
5. ____	____	____	____
50% = ____, 20% = ____	8	= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Sarcocoma pacifica*	40	yes	OBL
2. *Arthrocnemum subterminale*	8	no	FACW
3. *Melilotus indica*	15	no	FAC
4. *Frankenia salina*	5	no	FACW
5. *Polypogon monspeliensis*	20	yes	FACW
6. ____	____	____	____
7. ____	____	____	____
8. ____	____	____	____
50% = 44, 20% = 17.6	88	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. ____	____	____	____
2. ____	____	____	____
50% = ____, 20% = ____	____	= Total Cover	
% Bare Ground in Herb Stratum 4	% Cover of Biotic Crust ____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Project Site: San Dieguito W19

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (Moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100					sndy cly lm	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): ____

Hydric Soils Present? Yes ☒ No ☐

Remarks: Soil is not the mapped soil, but after years of agriculture onsite it is a sandy clay loam

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ____

Water Table Present? Yes ☐ No ☒ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): ____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Salt on surface is from capillary action and not evaporation of surface water, no hydrology indicators

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site City/County: San Diego/San Diego Sampling Date: 4/7/11

Applicant/Owner: SANDAG State: CA Sampling Point: 2

Investigator(s): Sue Scatolini, Chris Nordby Section, Township, Range: 14S 12R Sect 7, 12

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): C Lat: 32.9749 Long: -117.2396 Datum: ____

Soil Map Unit Name: Tujunga sand NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	
Hydric Soil Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50% = ____, 20% = ____		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
50% = ____, 20% = ____		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Sarcocornia pacifica*	5	yes	OBL
2. *Cyperus sp.*	1	no	FACW
3. *Malvella leprosa*	1	no	FACU
4.			
5.			
6.			
7.			
8.			
50% = ____, 20% = ____	7	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
50% = ____, 20% = ____		= Total Cover	
% Bare Ground in Herb Stratum 93	% Cover of Biotic Crust ____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Project Site: ____

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100					sndy clay lm	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): ____

Hydric Soils Present? Yes ☒ No ☐

Remarks: Soil is not the mapped soil, but after years of agriculture onsite it is a sandy clay loam

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 2

Water Table Present? Yes ☒ No ☐ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): ____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Small furrow that holds water from rainfall.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site　City/County: San Diego/San Diego　Sampling Date: 4/7/11

Applicant/Owner: SANDAG　State: CA　Sampling Point: 3

Investigator(s): Sue Scatolini, Chris Nordby　Section, Township, Range: 14S 12R Sect 7, 12

Landform (hillslope, terrace, etc.): terrace　Local relief (concave, convex, none): concave　Slope (%): 0

Subregion (LRR): C　Lat: 32.975　Long: -117.2396　Datum: ____

Soil Map Unit Name: Tujunga sand　NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?　Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic?　(If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:____)	Absolute % Cover	Dominant Species?	Indicator Status
1. ____	____	____	____
2. ____	____	____	____
3. ____	____	____	____
4. ____	____	____	____
50% = ____, 20% = ____	____	= Total Cover	
Sapling/Shrub Stratum (Plot size:____)			
1. ____	____	____	____
2. ____	____	____	____
3. ____	____	____	____
4. ____	____	____	____
5. ____	____	____	____
50% = ____, 20% = ____	____	= Total Cover	
Herb Stratum (Plot size:____)			
1. *Sarcoconia pacifica*	80	yes	OBL
2. ____	____	____	____
3. ____	____	____	____
4. ____	____	____	____
5. ____	____	____	____
6. ____	____	____	____
7. ____	____	____	____
8. ____	____	____	____
50% = ____, 20% = ____	80	= Total Cover	
Woody Vine Stratum (Plot size:____)			
1. ____	____	____	____
2. ____	____	____	____
50% = ____, 20% = ____	____	= Total Cover	
% Bare Ground in Herb Stratum 20	% Cover of Biotic Crust ____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Project Site: San Dieguito W19

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (Moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10 YR 3/1	100					sndy cly lm	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soils Present? Yes ☒ No ☐

Remarks: Soil is not the mapped soil, but after years of agriculture onsite it is a sandy clay loam, depleted matrix

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☒	No ☐	Depth (inches): 2-4		
Water Table Present?	Yes ☒	No ☐	Depth (inches): ____		
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches): ____	**Wetland Hydrology Present?**	Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Lower area that holds water from rainfall. No surface connection.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site City/County: San Diego/San Diego Sampling Date: 7/10/13

Applicant/Owner: SANDAG State: CA Sampling Point: 4

Investigator(s): Sue Scatolini, Chris Nordby Section, Township, Range: 14 S 12R Sect 7,12

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C Lat: 32.9752 Long: -117.2327 Datum: ____

Soil Map Unit Name: Tujunga sand NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. ____			
2. ____			
3. ____			
4. ____			
50% = ____, 20% = ____		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. ____			
2. ____			
3. ____			
4. ____			
5. ____			
50% = ____, 20% = ____		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Cressa truxillensis*	80	yes	FACW
2. *Suaeda taxifolia*	2	no	FACW
3. *Sarcoconia pacifica*	2	no	OBL
4. ____			
5. ____			
6. ____			
7. ____			
8. ____			
50% = ____, 20% = ____	84	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. ____			
2. ____			
50% = ____, 20% = ____		= Total Cover	
% Bare Ground in Herb Stratum 16	% Cover of Biotic Crust ____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Project Site: SDW19

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/2	100					Silt, cly, lm	Silty clay loam

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):		
Water Table Present?	Yes ☐	No ☒	Depth (inches):		
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (inches):		

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: There are no hydrological indicators in this area. Salt on surface is from salt wicking through soil, not saline surface water evaporating.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site | City/County: San Diego/San Diego | Sampling Date: 7/10/13

Applicant/Owner: SANDAG | State: CA | Sampling Point: 5

Investigator(s): Sue Scatolini, Chris Nordby | Section, Township, Range: 14 S 12R Sect 7,12

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): C | Lat: 32.9765 | Long: -117.2313 | Datum: ____

Soil Map Unit Name: Tujunga sand | NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☒	
Hydric Soil Present?	Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50% = ____, 20% = ____		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
50% = ____, 20% = ____		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Rumex crispus*	40	yes	FAC
2. *Epilobium ciliatum*	2	no	FACW
3. *Cynodon dactylon*	45	yes	FACU
4.			
5.			
6.			
7.			
8.			
50% = ____, 20% = ____	87	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
50% = ____, 20% = ____		= Total Cover	
% Bare Ground in Herb Stratum 13	% Cover of Biotic Crust ____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species		x1 =	
FACW species	2	x2 =	4
FAC species	40	x3 =	120
FACU species	45	x4 =	180
UPL species		x5 =	
Column Totals:	87 (A)		304 (B)

Prevalence Index = B/A = 3.49

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

Project Site: SDW19

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (Moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/2	100					Silt loam	no coarse sand

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soils Present? Yes ☐ No ☒

Remarks: No redox features, very homogenous, no organics

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches): ____
Water Table Present?	Yes ☐	No ☒	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (inches): ____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: There are no hydrological indicators in this area. It is at the edge of a lower depression, but no other characteristics

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site — City/County: San Diego/San Diego — Sampling Date: 7/10/13

Applicant/Owner: SANDAG — State: CA — Sampling Point: 6

Investigator(s): Sue Scatolini, Chris Nordby — Section, Township, Range: 14 S 12R Sect 7,12

Landform (hillslope, terrace, etc.): terrace — Local relief (concave, convex, none): none — Slope (%): 0

Subregion (LRR): C — Lat: 32.978 — Long: -117.2309 — Datum: ____

Soil Map Unit Name: Tujunga sand — NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	
Hydric Soil Present?	Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tamarix ramosissima*	43	yes	FAC
2. ____			
3. ____			
4. ____			
50% = ____, 20% = ____	43	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. ____			
2. ____			
3. ____			
4. ____			
5. ____			
50% = ____, 20% = ____	____	= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Sarcoconia pacifica*	50	yes	OBL
2. *Pluchea odorata*	7	no	FACW
3. ____			
4. ____			
5. ____			
6. ____			
7. ____			
8. ____			
50% = ____, 20% = ____	57	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. ____			
2. ____			
50% = ____, 20% = ____	____	= Total Cover	
% Bare Ground in Herb Stratum 43	% Cover of Biotic Crust ____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Project Site: SDW19

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 4/3	100					Silt cly lm	
5-18	7.5 Y/R 2/0	90		10				Black around roots

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): ____

Hydric Soils Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):	____	
Water Table Present?	Yes ☒	No ☐	Depth (inches):	18	
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches):	14	**Wetland Hydrology Present?** Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site | City/County: San Diego/San Diego | Sampling Date: 7/10/13

Applicant/Owner: SANDAG | State: CA | Sampling Point: 7

Investigator(s): Sue Scatolini, Chris Nordby | Section, Township, Range: 14 S 12R Sect 7,12

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): convex | Slope (%): 0

Subregion (LRR): C | Lat: 32.978 | Long: -117.2309 | Datum: ____

Soil Map Unit Name: Tujunga sand | NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks: Site on berm approximately 12 feet upslope from Plot 6

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:____)	Absolute % Cover	Dominant Species?	Indicator Status
1. ____			
2. ____			
3. ____			
4. ____			
50% = ____, 20% = ____	____	= Total Cover	
Sapling/Shrub Stratum (Plot size:____)			
1. *Tamarix ramosissima*	50	yes	FAC
2. *Isocoma menziesii*	30	yes	FAC
3. ____			
4. ____			
5. ____			
50% = ____, 20% = ____	80	= Total Cover	
Herb Stratum (Plot size:____)			
1. *Carpobrotus edulis*	5	yes	UPL
2. *Brassica nigra*	10	yes	UPL
3. *Anemopsis californica*	1	no	OBL
4. *Heliotropium curvassavicum*	3	no	FACU
5. ____			
6. ____			
7. ____			
8. ____			
50% = 9.5, 20% = 3.8	19	= Total Cover	
Woody Vine Stratum (Plot size:____)			
1. ____			
2. ____			
50% = ____, 20% = ____	____	= Total Cover	
% Bare Ground in Herb Stratum 1	% Cover of Biotic Crust ____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x1 =	1
FACW species	____	x2 =	____
FAC species	80	x3 =	240
FACU species	3	x4 =	12
UPL species	15	x5 =	75
Column Totals:	99 (A)		328 (B)

Prevalence Index = B/A = 3.28

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

Project Site: SDW19

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/2	100					Silt sand	Homogenous

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless noted otherwise.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): ____

Hydric Soils Present? Yes ☐ No ☒

Remarks: No redox concentrations were observed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

	Yes		No		Depth (inches):
Surface Water Present?	Yes	☐	No	☒	____
Water Table Present?	Yes	☐	No	☒	____
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site   City/County: San Diego/San Diego   Sampling Date: 7/10/13

Applicant/Owner: SANDAG   State: CA   Sampling Point: 8

Investigator(s): Sue Scatolini, Chris Nordby   Section, Township, Range: 14 S 12R Sect 7,12

Landform (hillslope, terrace, etc.): terrace   Local relief (concave, convex, none): concave   Slope (%): 0

Subregion (LRR): C   Lat: 32.9779   Long: -117.2309   Datum: ____

Soil Map Unit Name: Tujunga sand   NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?   Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	
Hydric Soil Present?	Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks: Site in low are inland of berm where plot 7 was collected.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tamarix ramossisma*	75	yes	FAC
2. *Salix gooddingii*	10	no	FACW
3. ____	____	____	____
4. ____	____	____	____
50% = ____, 20% = ____	85	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. *Baccharis salicifolia*	10	yes	FAC
2. ____	____	____	____
3. ____	____	____	____
4. ____	____	____	____
5. ____	____	____	____
50% = ____, 20% = ____	10	= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Sarcoconia pacifica*	5	yes	OBL
2. ____	____	____	____
3. ____	____	____	____
4. ____	____	____	____
5. ____	____	____	____
6. ____	____	____	____
7. ____	____	____	____
8. ____	____	____	____
50% = ____, 20% = ____	5	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. ____	____	____	____
2. ____	____	____	____
50% = ____, 20% = ____	____	= Total Cover	
% Bare Ground in Herb Stratum ____		% Cover of Biotic Crust ____	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☒

Remarks:

Project Site: SDW19

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/2	100					sand	
14-18	10YR 2/2	95	10YR 4/6	5			sand	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): ____

Hydric Soils Present? Yes ☐ No ☒

Remarks: No redox concentrations were observed within the top 6 inches of soil

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches): ____		
Water Table Present?	Yes ☐	No ☒	Depth (inches): ____		
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (inches): ____	**Wetland Hydrology Present?**	Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Low area with no obvious hydrology other than a low point inland of berm between this low area and the low area closer to the river (plot 6)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site   City/County: San Diego/San Diego   Sampling Date: 7/10/13

Applicant/Owner: SANDAG   State: CA   Sampling Point: 9

Investigator(s): Sue Scatolini, Chris Nordby   Section, Township, Range: 14 S 12R Sect 7,12

Landform (hillslope, terrace, etc.): terrace   Local relief (concave, convex, none): concave   Slope (%): 0

Subregion (LRR): C   Lat: 32.978   Long: -117.2309   Datum: ____

Soil Map Unit Name: Tujunga sand   NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☒, Soil ☒, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☒

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: Plot collected in drainage outlet (culvert) from other side of El Camino Real. New culvert/wildlife crossing construction in the last year in the area. Soils likely disturbed during construction. Site is considered a wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. ____			
2. ____			
3. ____			
4. ____			
50% = ____, 20% = ____	____	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. *Salix lasiolepis less than 1 ft tall*	1	yes	FACW
2. ____			
3. ____			
4. ____			
5. ____			
50% = ____, 20% = ____	1	= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Symphyotrichum subulatum*	5	yes	OBL
2. *Heliotropium curvassavicum*	1	no	FACU
3. *Bassia hyssopifolia*	2	yes	FAC
4. *Erigeron canadensis*	2	yes	FACU
5. ____			
6. ____			
7. ____			
8. ____			
50% = ____, 20% = ____	10	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. ____			
2. ____			
50% = ____, 20% = ____	____	= Total Cover	
% Bare Ground in Herb Stratum 89	% Cover of Biotic Crust ____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	75	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Mostly bare area with a few small herbs and a couple small <1 ft willows

Project Site: SDW19

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/3	70	10YR 5/4				sndy,cly,lm	gravel & rock from construction of culvert

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): ____

Hydric Soils Present? Yes ☐ No ☒

Remarks: No soil indicators, area has been altered from construction of wildlife crossing in culvert

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ____

Water Table Present? Yes ☐ No ☒ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): ____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Water carried through culvert during rain events. Low area

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site   City/County: San Diego/San Diego   Sampling Date: 7/10/13

Applicant/Owner: SANDAG   State: CA   Sampling Point: 10

Investigator(s): Sue Scatolini, Chris Nordby   Section, Township, Range: 14 S 12R Sect 7,12

Landform (hillslope, terrace, etc.): terrace   Local relief (concave, convex, none): none   Slope (%): 0

Subregion (LRR): C   Lat: 32.9745   Long: -117.2359   Datum: ____

Soil Map Unit Name: Tujunga sand   NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☒, Soil ☒, or Hydrology ☐ significantly disturbed?   Are "Normal Circumstances" present? Yes ☐ No ☒

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks: Plot collected in horseshoe around low area by culvert to determine edge of wetland

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:____)			
1. ____			
2. ____			
3. ____			
4. ____			
50% = ____, 20% = ____	____	= Total Cover	
Sapling/Shrub Stratum (Plot size:____)			
1. ____			
2. ____			
3. ____			
4. ____			
5. ____			
50% = ____, 20% = ____	____	= Total Cover	
Herb Stratum (Plot size:____)			
1. *Sarcoconia pacifica*	20	yes	OBL
2. *Polypogon monspeliensis*	12	yes	FACW
3. *Cotula coron.*	15	yes	OBL
4. ____			
5. ____			
6. ____			
7. ____			
8. ____			
50% = ____, 20% = ____	47	= Total Cover	
Woody Vine Stratum (Plot size:____)			
1. ____			
2. ____			
50% = ____, 20% = ____	____	= Total Cover	
% Bare Ground in Herb Stratum 53	% Cover of Biotic Crust ____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: further outside of drainage from culvert by plot 9

Project Site: SDW19

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (Moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/2	100					sndy,cly,lm	
14-18	10YR 2/1	100					clay	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): ____

Hydric Soils Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ____

Water Table Present? Yes ☐ No ☒ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): ____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area is just outside the wetland area. Soil cracks just downslope. No hydrology indicators here.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site City/County: San Diego/San Diego Sampling Date: 7/10/13

Applicant/Owner: SANDAG State: CA Sampling Point: 11

Investigator(s): Sue Scatolini, Chris Nordby Section, Township, Range: 14 S 12R Sect 7,12

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): C Lat: 32.9754 Long: -117.2388 Datum: ____

Soil Map Unit Name: Tujunga sand NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks: Site at end of drainage channel near utility corridor

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	6	yes	FACW
2. *Salix gooddingii*	6	yes	FACW
3. ____			
4. ____			
50% = ____, 20% = ____	12	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. *Baccharis salicifolia*	10	yes	FAC
2. ____			
3. ____			
4. ____			
5. ____			
50% = ____, 20% = ____	10	= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Distichlis spicata*	10	no	FAC
2. *Malvella leprosa*	45	yes	FACU
3. *Xanthium strumarium*	4	no	FAC
4. ____			
5. ____			
6. ____			
7. ____			
8. ____			
50% = ____, 20% = ____	59	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. ____			
2. ____			
50% = ____, 20% = ____	____	= Total Cover	
% Bare Ground in Herb Stratum 19		% Cover of Biotic Crust ____	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	75	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Project Site: SDW19

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (Moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	100					Silt	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): ____

Hydric Soils Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ____

Water Table Present? Yes ☐ No ☒ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): ____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No secondary indicators in end of channel indicating hydrology. Rest of channel has standing water and more wetland species

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site   City/County: San Diego/San Diego   Sampling Date: 7/10/13

Applicant/Owner: SANDAG   State: CA   Sampling Point: 12

Investigator(s): Sue Scatolini, Chris Nordby   Section, Township, Range: 14 S 12R Sect 7,12

Landform (hillslope, terrace, etc.): terrace   Local relief (concave, convex, none): none   Slope (%): 0

Subregion (LRR): C   Lat: 32.9754   Long: -117.2388   Datum: ____

Soil Map Unit Name: Tujunga sand   NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed?   Are "Normal Circumstances" present? Yes ☐ No ☒

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	
Hydric Soil Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: **Site was used as settling basin for SONGS restoration in 2012. The site has all three wetland criteria; however, the hydrology indicators were artificially produced and are not expected to persist. No wetland characteristics were observed onsite prior to creation of the settling basin and no hydrology indicators are present in the slightly higher elevations in the same area used. Therefore, it was determined that the area is not a 3-criteria wetland**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:____)	Absolute % Cover	Dominant Species?	Indicator Status
1. ____	____	____	____
2. ____	____	____	____
3. ____	____	____	____
4. ____	____	____	____
50% = ____, 20% = ____	____	= Total Cover	
Sapling/Shrub Stratum (Plot size:____)			
1. ____	____	____	____
2. ____	____	____	____
3. ____	____	____	____
4. ____	____	____	____
5. ____	____	____	____
50% = ____, 20% = ____	____	= Total Cover	
Herb Stratum (Plot size:____)			
1. *Sarcoconia pacifica*	15	no	FACW
2. *Bassia hyssopifolia*	35	yes	FAC
3. *Suaeda taxifolia*	2	no	FACW
4. *Mesembryanthemum crystallinum*	12	no	FACU
5. *Polypogon monspelienensis*	10	no	FACW
6. *Cotula coronopifolia*	2	no	OBL
7. ____	____	____	____
8. ____	____	____	____
50% = 38, 20% = 15.2	76	= Total Cover	
Woody Vine Stratum (Plot size:____)			
1. ____	____	____	____
2. ____	____	____	____
50% = ____, 20% = ____	____	= Total Cover	
% Bare Ground in Herb Stratum 24	% Cover of Biotic Crust ____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Project Site: SDW19

SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/2	100					Silt	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): ____

Hydric Soils Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):	____	
Water Table Present?	Yes ☐	No ☒	Depth (inches):	____	
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (inches):	____	**Wetland Hydrology Present?** Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: A few soil cracks from the deepest end of the desiltation basin onsite.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: San Dieguito W19 Restoration Site | City/County: San Diego/San Diego | Sampling Date: 7/10/13
Applicant/Owner: SANDAG | State: CA | Sampling Point: 13
Investigator(s): Sue Scatolini, Chris Nordby | Section, Township, Range: 14 S 12R Sect 7,12
Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): concave | Slope (%): 0
Subregion (LRR): C | Lat: 32.9734 | Long: -117.2401 | Datum: ____
Soil Map Unit Name: Tujunga sand | NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	
Hydric Soil Present?	Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks: Low area of disturbed southern willow scrub surrounded by transitional habitat

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	60	yes	FACW
2. ____			
3. ____			
4. ____			
50% = ____, 20% = ____	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. *Baccharis salicifolia*	5	yes	FAC
2. ____			
3. ____			
4. ____			
5. ____			
50% = ____, 20% = ____	5	= Total Cover	
Herb Stratum (Plot size: ____)			
1. ____			
2. ____			
3. ____			
4. ____			
5. ____			
6. ____			
7. ____			
8. ____			
50% = ____, 20% = ____	____	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. ____			
2. ____			
50% = ____, 20% = ____	____	= Total Cover	
% Bare Ground in Herb Stratum 100	% Cover of Biotic Crust ____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x1 =	____
FACW species	____	x2 =	____
FAC species	____	x3 =	____
FACU species	____	x4 =	____
UPL species	____	x5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Project Site: SDW19

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/3	100					Silt	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soils Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):		
Water Table Present?	Yes ☐	No ☒	Depth (inches):		
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (inches):	**Wetland Hydrology Present?**	Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Low area surrounded by transitional habitat. No evidence of any flow or water remaining onsite

PRELIMINARY JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): December 2013

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD: Sue Scatolini, Project Biologist, California Department of Transportation (Caltrans), District 11, Environmental Resource Studies, 4050 Taylor Street, San Diego, California 92110

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: Carlsbad, CA, San Dieguito W19 Restoration Site, SPL-2011-00393

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(Use the attached table to document multiple waterbodies at different sites)
State: CA County/parish/borough: San Diego City: San Diego
Center coordinates of site (lat/long in degree decimal format): Lat.32.9754, Long. -117.2388
Universal Transverse Mercator:
Name of nearest waterbody: San Dieguito River flows immediately adjacent to site.
Identify (estimate) amount of waters in the review area:
Non-wetland waters:
Stream Flow: Perennial
Wetlands: 1.63 acres Cowardin Class: Riverine, unconsolidated bottom, intermittently flooded
Name of any waterbodies on the site that have been identified as Section 10 waters: None
Tidal: none
Non-Tidal: none

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☒ Office (Desk) Determination. Date: December 2013
☒ Field Determination. Date(s): April 7, 2011 and July 10, 2013

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable. This preliminary JD finds that there "may be" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

A. **SUPPORTING DATA. Data reviewed for JD (check all that apply** - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:.
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: Del Mar T14S R 12W Sect 7, 12.
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
- ☐ National wetlands inventory map(s). Cite name:
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☒ Photographs: ☒ Aerial (Name & Date): San Diego County SID 2012.
  or ☐ Other (Name & Date):.
- ☐ Previous determination(s). File no. and date of response letter:
- ☐ Other information (please specify):.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and date of
Regulatory Project Manager
(REQUIRED)

[signature] 11/27/14
Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining
the signature is impracticable)

Site number	Latitude	Longitude	Cowardin Class	Estimated amount of aquatic resource in review area	Class of aquatic resource
1	32.9754	-117.2388	Riverine, unconsolidated bottom, intermittently flooded	The site is proposed for re-establishment of saltmarsh and freshwater marsh for mitigation. Some existing degraded wetland may be impacted. There is approximately 1.63 acres of jurisdictional wetlands within the restoration area. Additional areas may be affected along the edge of the river.	Section 404 (non-Section 10 – tidal)

Appendix F
Report of Least Bell's Vireo Surveys Conducted for the Proposed SANDAG San Dieguito Lagoon W19 Wetland Mitigation Project, San Diego County

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NORDBY BIOLOGICAL CONSULTING

August 22, 2012

Ms. Susie Tharratt
U.S. Fish and Wildlife Service
6010 Hidden Valley Road
Carlsbad, CA 92009

Subject: Report of Least Bell's Vireo Surveys Conducted for the Proposed SANDAG San Dieguito Lagoon W19 Wetland Mitigation Project, San Diego County

Introduction

San Diego Association of Governments (SANDAG), in conjunction with the San Dieguito River Park Joint Powers Authority, California Department of Transportation, and the City of San Diego, proposes to develop a restoration plan to mitigate for impacts associated with highway and transit improvements in the Interstate 5 North Coast and Los Angeles-San Diego Rail corridors, and the El Camino Real Road and Bridge Improvement project. The study area consists of approximately 127 acres in the City of San Diego situated east of I-5, south of Villa De La Valle (County Highway S6) and west of El Camino Real (Figure 1).

It has been documented that the portion of the project area immediately west of the existing El Camino Real bridge supports native riparian vegetation that provides appropriate habitat for the federally and state endangered least Bell's vireo (*Vireo bellii pusillus;* Tierra Environmental Services 2006). Thus, presence/absence surveys for this species were conducted to determine the current status of this species on-site.

Physical Setting

The project area that could potentially support nesting least Bell's vireo consists of the relatively flat, stream bottom habitat of the San Dieguito River. Disturbed southern willow scrub habitat occurs west of the bridge for approximately 400 feet. This habitat supports willows (*Salix* spp.), mule-fat (*Baccharis salicifolia*) and is infested with non-native salt cedar (*Tamarix* sp.). The area west of the bridge and south of the river consists of former agricultural fields that support disturbed habitat with a large monotypic stand of tree tobacco (*Nicotiana glauca*). East of the bridge, the vegetation is dominated by southern cattail (*Typha domingensis)* and California bulrush (*Schoenoplectus californicus*). Although habitat east of the bridge is not considered least Bell's vireo breeding habitat, surveys for vireo were conducted approximately 500 feet on both sides of the bridge.

Land uses in the project area include undeveloped open space, an equestrian center, and polo fields

Methods

Eight focused surveys for least Bell's vireo were conducted according to USFWS protocol (Attachment A). All surveys were conducted by C. Nordby, of Nordby Biological Consulting (Nordby Biological).

Surveys were conducted by walking on upland areas immediately adjacent to the San Dieguito River. The surveyor would stop approximately every 75–100 feet and listen for vocalizations of least Bell's vireo and other bird species.

Surveys were conducted on May 24, June 4, 13 and 25, July 6, 16 and 26, and August 6 of 2012 as summarized in Table 1. Field notes are included in Attachment B. Although the end date of August 6, 2012 slightly exceeded the July 31 end date suggested in the survey protocol, this did not significantly affect the results of the surveys.

Results

A single territorial male least Bell's vireo was detected aurally and visually within the survey area. This vireo was detected on six of the eight surveys and was not detected during the July 26 and August 6 surveys. The vireo vocalized from perches within the monotypic tree tobacco stand that has colonized the former agricultural field west of the El Camino Real bridge, calling from sites approximately 100 to 200 feet west of the bridge. Passive observation of this male did not reveal a mate.

Light-footed clapper rails (*Rallus longirostris levipes*) a state and federally-listed endangered species and a state fully-protected species was detected aurally during five of the eight surveys. This species was detected "clappering" and "keking" from three general locations: directly under the southern abutment of the bridge and approximately 200 feet east and west of the bridge.

White-tail kite (*Elanus leucurus*) a state fully-protected species was observed on two occasions. Nest sites of this species are protected. One to three juvenile kites were observed perched on tree tobacco and the edges of the stand. No adults were observed during the surveys.

A complete list of bird species observed during the surveys is presented in Attachment C.

Discussion

The project as proposed would result in impacts to the disturbed habitat that was occupied by a single male least Bell's vireo during the 2012 breeding season. The area west and south of the existing bridge has been proposed as a mitigation site for impacts incurred during construction of the new bridge. The monotypic stand of tree tobacco, as well as other disturbed upland areas, will be converted to fresh water wetlands and southern willow scrub habitat. It is anticipated that the southern willow scrub habitat created for mitigation will provided suitable nesting habitat for this species. Thus, impacts may be considered temporary and indirect. Direct impacts to vireos and other riparian birds observed on-site can be avoided by restricting vegetation removal activities to the non-breeding season (September 15 – February 14).

Sincerely,

Chris Nordby

Chris Nordby
Principal Biologist

attachments

Literature Cited

Tierra Environmental Services. 2006. Natural Environment Study for the El Camino Real Road and Bridge Improvement Project.

Table 1. Least Bell's Vireo Focused Field Survey Dates, Weather Conditions, and Results

Survey Number	Date	Time	Weather Conditions at Start of Survey	Vireos Detected by Location	Surveyor
1	May 24, 2012	0550-0752	62°F, overcast, wind 0-5 mph	200' west of bridge	C. Nordby
2	June 4, 2012	0553-0748	61°F, overcast, no wind	200' west of bridge	C. Nordby
3	June 13, 2012	0605-0750	59°F, overcast, no wind	200' west of bridge	C. Nordby
4	June 25, 2012	0553-0750	62°F, clear, no wind	100' west of bridge	C. Nordby
5	July 6, 2012	0600-0752	65°F, overcast, no wind	200' west of bridge	C. Nordby
6	July 16, 2012	0555--0740	65°F, partly cloudy, no wind	200' west of bridge	C. Nordby
7	July 26, 2012	0601-0729	64°F, overcast, no wind	None Detected	C. Nordby
8	August 6,2012	0558-0740	66°F, partly cloudy, wind 0-5 mph	None Detected	C. Nordby

V:\1899_SD9_San_Dieguito\Feasibility_Figures\F2_Project_Location.mxd

Source: ESRI 2008;Dokken Engineering 8/16/2012; Created By: sarahj

0 0.1 0.2 0.3 0.4 0.5 Miles

FIGURE 1

PROJECT LOCATION

San Dieguito Lagoon W19 Restoration Project

San Diego County, California

Attachment A. Least Bell's Vireo Survey Guidelines

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2730 Loker Avenue West
Carlsbad, California 92008

JAN 1 9 2001

LEAST BELL'S VIREO SURVEY GUIDELINES

The following suggested guidelines are provided to facilitate accurate assessments of the presence/absence of the State and federally endangered least Bell's vireo (*Vireo bellii pusillus*, vireo), to provide the Fish and Wildlife Service with sufficient information to adequately respond to requests for applicable Federal permits and licenses, and to fulfill our mandate to conserve and recover the species. Currently, a recovery permit pursuant to section 10(a)(1)(A) of the Endangered Species Act is not required to conduct presence/absence surveys for the vireo, as long as this protocol is utilized and vocalization tapes are not used. These guidelines include minor modifications to our February 1992 guidelines and provide clarification of what we have been verbally recommending.

1. Under normal circumstances, all riparian areas and any other potential vireo habitats should be surveyed at least eight (8) times during the period from April 10 to July 31. However, we may concur, on a case by case basis, with a reduced effort if unusual circumstances dictate that this is a prudent course of action. For instance, intensive surveys of small, marginal or extralimital habitats by experienced personnel may well result in defensible conclusions that eight (or more) individual survey are unnecessary. Under such unusual circumstances, we will consider requests for reductions in the prescribed number of individual surveys. In any case, site visits should be conducted at least 10 days apart to maximize the detection of, for instance, late and early arrivals, females, particularly "non vocal" birds of both sexes, and nesting pairs.

2. Although the period from April 10 to July 31 encompasses the period during which most vireo nesting activity occurs, eight surveys are generally sufficient to detect most (if not all) vireo adults in occupied habitats. Precise vireo censuses and estimations of home range likely will not be possible unless surveys are conducted outside of this time window. Although focused surveys conducted in accordance with these guidelines substantially reduce the risk of an unauthorized take* that could potentially occur as a result of land development or other projects, individual project proponents may wish to conduct surveys that are more rigorous than those that would otherwise result from strict adherence to these survey guidelines. If additional information (e.g., extent of occupied habitat, total numbers of adult and juvenile vireos in study area) is desired or necessary, surveys should be extended to August 31 and conducted in such a manner as to collect the data necessary to prepare reports that reflect the methods and standards established in the current scientific literature on this subject. In particular, information collected after July

15 will reflect a broader extent to the riparian habitat and other adjacent habitat types that the vireo typically utilizes during the latter phase of the breeding season, especially when the young become independent of the adults.

3. Surveys should be conducted by a qualified biologist familiar with the songs, whisper songs, calls, scolds, and plumage characteristics of adult and juvenile vireos. These skills are essential to maximize the probability of detecting vireos and to avoid potentially harassing the species in occupied habitats.

4. Surveys should be conducted between dawn and 11:00 a.m. Surveys should not be conducted during periods of excessive or abnormal cold, heat, wind, rain, or other inclement weather that individually or collectively may reduce the likelihood of detection.

5. Surveyors should not survey more than 3 linear kilometers or more than 50 hectares of habitat on any given survey day. Although surveyors should generally station themselves in the best possible locations to hear or see vireos, care should be taken not to disturb potential or actual vireo habitats and nests or the habitat of any sensitive or listed riparian species.

6. All vireo detections (e.g., vocalization points, areas used for foraging, etc.) should be recorded and subsequently plotted to estimate the location and extent of habitats utilized. These data should be mapped on the appropriate USGS quadrangle map.

7. Data pertaining to vireo status and distribution (e.g., numbers and locations of paired or unpaired territorial males, ages and sexes of all birds encountered) should be noted and recorded during each survey. In addition, surveyors should look for leg bands on vireo adults and juveniles if, in fact, it is possible to do so without disturbing or harassing the birds. If leg bands or other markers are observed, then surveyors should record and report the detection and associated circumstances to us by telephone, facsimile, or electronic mail as soon as possible. Reports should include the colors and relative locations of any and all bands detected, the age and sex of the marked bird, and the precise location of the detection.

8. The numbers and locations of all brown-headed cowbirds (*Molothrus ater*) detected within vireo territories should be recorded during each survey and subsequently reported to us. In addition, all detections of the State and federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*, flycatcher) and State endangered yellow-billed cuckoo (*Coccyzus americanus*, cuckoo) should be recorded and reported. Any and all cuckoo and flycatcher adults, young, or nests should not be approached, and taped vocalizations of these species should not be used unless authorized in advance by scientific permits to take* issued by us (if appropriate) and the California Department of Fish and Game. Flycatcher presence/absence surveys require a recovery permit issued by us per section 10(a)(1)(A) of the Endangered Species Act.

9. To avoid the potential harassment of vireos, flycatchers, and cuckoos resulting from vireo surveys, other riparian species survey efforts, or multiple surveys within a given riparian habitat patch, detections of these three species should be reported to us as soon possible by telephone, facsimile, or electronic mail.

10. A final report (including maps) should be prepared that depicts survey dates and times and includes descriptions or accounts of the methods, locations, data and information identified in preceding sections.

11. This final report should be provided to us (at the letterhead address) and to the local office of the Department of Fish and Game within 45 calendar days following the completion of the survey effort. Additionally, a summary of all vireo survey efforts conducted during the calendar year should be submitted to each of the above offices by January 31 of the following year.

Should you have data or information to report, or have any questions regarding these survey guidelines, please contact Christine Moen (christine_moen@fws.gov), or Loren Hays (loren_hays@fws.gov) of my staff at (760) 431-9440 (facsimile 760-431-9624), or John Gustafson (jgustafs@hq.dfg.ca.gov) with the Department of Fish and Game at (916) 654-4260 (facsimile 916-653-1019).

Sincerely,

Andrew R. Green

Ken S. Berg
Acting Field Supervisor

* The term "take," as defined in Section 3, paragraph 18 of the Endangered Species Act of 1973 as amended (Act), means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. "Take" (specifically "harass") is further defined to mean "an act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, and sheltering" "Take" (specifically "harm") is further defined as an "act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding feeding or sheltering" (50 CFR 17.3). Please be advised that the take of the vireo and other listed species is prohibited by section 9 of the Act unless authorized by permits issued pursuant to section 7 or section 10 to the Act.

Attachment B. Field Notes

SDL LBV 5/24/12
start 5:50 am
62° wind 0-5 mph, overcast
end 7:52
1 ♂ LBV ≃ 200' west of bridge
in tree tobacco stand
SOSP ~~[illegible]~~ Starling
grackle Brown headed cowbird
LFCR under bridge
LEGO red-wing blackbird
House finch cliff swallows
Common yellowthroat
Annas Hummingbird Caspian tern or hewe
Bushtit
Black-headed Grosbeak
Am crow
RTH overhead
Ca Quail

SDL LBV 6/14/12
start 5:53 61° nowind
end 7:48 overcast
SOSP
LBV = 200 west of bridge in tree tobacco
COYE
Am crow Cal gull
Cal Quail overhead
House finch red-wing
bushtit blackbird
Anna's
LFCR ~ 200' E of bridge
clapper rail
Black phoebe
Brown head cowbird
Cal towhee
Black-headed grosbeak

SDL LBV 6/13/12
start 6:05 59° overcast
end 9:50 no wind

SOSP LBV in tree
CO YT tobacco ≈ 200'
MODO west of bridge
Cal Quail ≈ 700 south of
Bushtit river
Annas 6BH
Am crow TV overhead
LEGO RTH on
NOMO utility tower
Swallow
Cal towhee
Black-headed grosbeak

coyote
~~blck~~ brush rabbit

SDL LBV 6/25/12
start 5:53 62° clear
no wind
end 7:50
LBV ≃ 100' west of bridge
LFCR ~ 200' east " "
recking
COYT
MODO RTH overhead
NOMO Am crow
Cal Quail Black phoebe
SOSP Swallows
Anna's
LEGO
Black-headed grosbeak
Bushtit
House finch
3 juvenile white-tail kites

SDL LBV 7/6/12
start 6:00 65° overcast
end 7:52 no wind

LEGO LBV in usual
Cal Towhee spot
SOSP LFCR kekking
House finch under bridge
Anna's
Caspian tern over head
BTH on wires
brown headed cow bird
COYT
1 juvenile white-tailed kite
Am crow Cal quail
Ca Quail overhead
Bushtit
Starling
Swallow
black-headed grosbeak

SDL LBV 7/16/12
Start 5:55 65° partly cloudy
no wind
end 7:40
LBV in usual spot
AMCR
~~common~~ Great egret overhead
Anna's
SOSP BH grosbeak
LEGO Ca Towhee
House finch
Starling
COYT
Swallow
Ca Quail
Bushtit
cowbird
RTH
MODO

SDL LBV 7/26/12
Start 6:01 64° overcast
no wind
end 7:29
SOSP No views
AMCR No COYT
BH grosbeak
Bushtit
Anna's
MODO
Great egret
RTH on wires
LEGO
Swallow under bridge
House finch
Starling
cowbird
Caspian tern OH
LFCR under bridge

8/4/12 SDL LBV
Start 5:58 66° partly cldy
0-5 mph
end 7:40

AMCR NO VIDEO
SOSP
~~H~~ House finch
Black phebe
MODO
Anna's
Bushtit
~~bl~~ red wing black bird
Ca Quail
Ca towhee
LEGO
Cowbird
swallow
Black phoebe

Attachment C. Bird Species Observed During Focused Least Bell's Vireo Surveys

Scientific Name	Common Name
Buteo jamaicensis	red-tailed hawk
Cathartes aura	turkey vulture
Callipepla californica	California quail
Zenaida macroura	mourning dove
Calypte anna	Anna's hummingbird
Sayornis nigricans	black phoebe
Vireo bellii pusillus	least Bell's vireo
Corvus brachyrhynchos	American crow
Petrochelidon pyrrhonota	cliff swallow
Psaltriparus minimus	bushtit
Mimus polyglottos	northern mockingbird
Sturnus vulgaris	European starling
Molothrus ater	brown-headed cowbird
Geothlypis trichas	common yellowthroat
Pheucticus melanocephalus	black-headed grosbeak
Pipilo crissalis	California towhee
Melospiza melodia	song sparrow
Carpodacus mexicanus	house finch
Carduelis psaltria	lesser goldfinch
Ardea alba	great egret
Ardea herodius	great blue heron
Larus californicus	California gull
Agelaius phoenices	red-winged black bird
Quiscalus sp.	grackle
Rallus longirostris levipes	light-footed clapper rail
Elanus leucurus	white-tailed kite
Sterna caspia	Caspian tern

Appendix G
Least Bell’s Vireo Focused Survey Results for the El Camino Real Road and Bridge Widening, City of San Diego, California

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September 23, 2009

Jerry Jakubauskas
Environmental Planner
City of San Diego | Engineering & Capital Projects
600 B Street, Suite 800, MS 908A
San Diego, CA 92101- 4592

Subject: Least Bell's Vireo Focused Survey Results for the El Camino Real Road and Bridge Widening, City of San Diego, California.

Dear Mr. Jakubauskas:

The El Camino Real Road and Bridge Widening Project involves widening El Camino Real between Via de la Valle to San Dieguito Road and replacement of the bridge over the San Dieguito River (Figures 1 and 2). The El Camino Real Bridge crosses over the San Dieguito River just south of the intersection of Via de la Valle and El Camino Real. This letter report provides the results of focused presence/absence surveys performed for least Bell's vireo (*Vireo bellii pusillus*) within the survey area. The survey area for these surveys is defined as all areas supporting potentially suitable habitat within the project footprint.

A Natural Environmental Study (NES) for this project was completed previously in June 2006. At this time, an updated NES has been requested. It was determined that updated focused surveys for least Bell's vireo would be required. Thus, eight protocol presence/absence surveys for this species were conducted to determine the present occurrence of this species on-site.

Existing Conditions

The project footprint includes a section of the San Dieguito River approximately 0.25 mile (mi) in length. This area supports a mosaic of wetland habitats comprised of native and exotic plant species. Within the survey area, potentially suitable habitat occurred in association with the San Dieguito River. Vegetation communities that were surveyed included disturbed southern willow scrub, disturbed mule-fat scrub, and tamarisk scrub. The San Dieguito River supported water throughout the survey window.

Disturbed southern willow scrub was predominated by red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), tamarisk (*Tamarix ramosissima*), narrow-leaf willow (*Salix exigua*), and mule-fat (*Baccharis salicifolia*).

Disturbed mule-fat scrub within the survey area was predominated by mule-fat and tamarisk. This habitat occurred adjacent to disturbed southern willow scrub.

Tamarisk scrub was predominated by tamarisk but also supported a few individuals of arroyo willow and mule-fat. This habitat type occurred adjacent to disturbed southern willow scrub and disturbed mule-fat scrub.

Birds routinely detected during the site visits included mallard (*Anas platyrhynchos*), American kestrel (*Falco sparverius*), mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), western scrub-jay (*Aphelocoma californica*), northern rough-winged swallow (*Steigidopteryx serripennis*), cliff swallow (*Petrochelidon pyrrhonota*), bushtit (*Psaltriparus minimus*), marsh wren (*Cistothorus palustris*), yellow warbler (*Dendroica petechia*), common yellowthroat (*Geothlypis trichas*), yellow-breasted chat (*Icteria virens*), California towhee (*Pipilo crissalis*), song sparrow (*Melospiza melodia*), red-winged blackbird (*Agelaius phoeniceus*), great-tailed grackle (*Quiscalus mexicanus*), brown-headed cowbird (*Molothrus ater*), house finch (*Carpodacus mexicanus*), and lesser goldfinch (*Carduelis psaltria*). A complete list of bird species detected during the focused surveys can be found in Attachment A.

Least Bell's Vireo Background

This westernmost subspecies of the Bell's vireo was first given protection as an endangered species by the state of California on 02 October 1980, and then by the federal government on 02 May 1986. The species is normally present on breeding grounds between 15 March and 15 September.

Least Bell's vireo is a small, migratory insect gleaner that normally selects dense vegetation low in riparian zones for nesting. As discussed in Franzreb (1989), among 126 locations of California nests recorded in the literature and in museum records, 71 (56%) were in willows and 14 (11%) were in wild rose (*Rosa* spp.). The remaining nests were distributed among 20 other species of vines, shrubs, herbs and trees.

Willows often dominate the canopy layer in the species' territories, with a mean canopy height of about 8 meters (Salata 1983). Salata believed that a dense, shrubby layer near the ground was a critical component in the breeding habitat. Goldwasser (1981) found that the most critical structural component is a dense shrub layer from 0.6 to 3.0 meters from the ground. As determined from field data (SANDAG and RECON 1990) for southern California, vireo nest sites were most frequently located in riparian stands between 5 and 10 years old. Even though mature trees are present at many of the sites, the average age of willow vegetation in the immediate vicinity of most nests was between 4 and 7 years. When mature riparian woodland is selected, vireos nest in areas with a substantial robust understory of willows as well as other plant species (Goldwasser 1981). Based on rigorous statistical analysis of vireo habitat structure and composition (SANDAG and RECON 1990), vireos appear to select sites with large amounts of both shrub and tree cover, a large degree of vertical stratification, and small amounts of aquatic and herbaceous cover.

Methods

From 17 April through 20 July 2009, eight focused surveys for least Bell's vireo were conducted within the survey area. Methods for the focused survey followed currently recommended guidelines for presence/absence surveys (USFWS 2001). See Table 2 for dates, times, and conditions.

Table 2: Focused Survey Visits and Conditions for Least Bell's Vireo Survey.

Date	Survey	Time	Conditions	Surveyor
4/17/09	#1	0720 - 0755	63-65° F; wind 0-2 mph; 0% cloud cover	K. Fischer
4/27/09	#2	0850-0950	68° F; wind 0-2 mph; 100% cloud cover	M. Alfaro
5/9/09	#3	0810-0920	69° F; wind 0-2 mph; 100% cloud cover	M. Alfaro
5/19/09	#4	0845 - 0945	67° F; wind 0-2 mph; hazy skies	E. Alfaro
5/30/09	#5	0820-0930	69° F; wind 0-2 mph; 100% cloud cover	M. Alfaro
6/9/09	#6	0635-0735	62° F; wind 0-2 mph; 100% cloud cover	K. Fischer
6/23/09	#7	0845 - 0945	65-68° F; wind 0 mph; 100% cloud cover	E. Alfaro
7/20/09	#8	1000 - 1100	78-80° F; wind 0-5 mph; no cloud cover	E. Alfaro

Under the methodology used, visits consist of careful, thorough coverage of potential habitat within the survey area on each survey visit. Attention was given to relevant plant and animal species identifiable either directly or indirectly by sign. No tape recording of vocalizations was used during any of the survey visits. Instead, all visual and auditory cues are sought during a greater number of visits (at weekly or greater intervals). Potential breeding and foraging habitat were assessed based on both personal experience and published literature. Habitat structure was not analyzed quantitatively. All visits were performed during morning hours, when vireos are most active.

At this time, no special permits are required to perform focused surveys for least Bell's vireo in accordance with the recommended guidelines. The biologists that conducted the surveys are experienced with the species and its habitat requirements.

Results. No least Bell's vireo individuals were detected during the 2009 focused surveys. Several other surveys in support of this project have occurred between 2002 and 2009. The results of these surveys were mixed. In 2002, no vireos were detected within the survey area during eight protocol surveys. However, in May 2004, two occupied least Bell's vireo territories were detected during an updated habitat assessment conducted within this current study area. One territory supported a solitary adult male and was located in disturbed southern willow scrub north of the San Dieguito River and west of El Camino Real Road. The second territory supported a pair and was located in disturbed southern willow scrub south of the San Dieguito River and west of El Camino Real.

Federally and state endangered light-footed clapper rail was detected aurally during the 17 April survey. In addition, yellow warbler and yellow-breasted chat, both state species of special concern, were detected within the survey area.

As required under the survey protocol, detections of brown-headed cowbird were recorded. Both male and female cowbirds were detected within the survey area. Typically, one to two females and several (3-6) males were detected within the survey area. The presence of brown-headed cowbirds may be attributed in part to the horse stables located north of the San Dieguito River and west of El Camino Real.

Conclusions

Protocol focused surveys were performed to determine the presence or absence of least Bell's vireo. No least Bell's vireos were detected during the survey visits. Thus, at this time it can be concluded that this species is absent from the survey area. Results of a protocol-focused survey can be assumed valid for at least one year following the last survey visit.

Please contact me if you have questions or need clarifications regarding this report.

Sincerely,

Erika Alfaro
ICF Biologist

Attachment A. Wildlife Species Detected Within the Survey Area

Attachment B. Figures

Literature Cited

Franzreb, K. E. 1989. Ecology and conservation of the endangered Least Bell's Vireo. U.S. Fish and Wildlife, Service Biol. Rep. 89(1).

Goldwasser, S. 1981. Habitat requirements of the Least Bell's Vireo. Calif. Dept. Fish and Game, Nongame Wildlife Investigations Rep. 81.09, Proj. E-W-4, Job IV-38.1. Nongame Bird and Mammal Sec. Rep. 81.09. 16 pp.

Salata, L. 1983. Status of the Least Bell's Vireo on Camp Pendleton, California. U.S. Fish and Wildlife Service, Laguna Niguel, CA. Unpubl. Rep.

San Diego Association of Governments and Regional Environmental Consultants (SANDAG and RECON). 1990. Draft Comprehensive Species Management Plan for the Least Bell's Vireo (Draft). San Diego Assoc. of Governments, San Diego, CA. 244 pp.

USFWS. 2001. Least Bell's Vireo Survey Guidelines. Report from Carlsbad, California Field Office, dated 19 January 2001. 3 pp.

ATTACHMENT A

WILDLIFE SPECIES DETECTED WITHIN THE SURVEY AREA

Attachemnt A. Wildlife Species Detected Within the Survey Area

Scientific Name	Common Name	Special Status
VERTEBRATES		
Reptiles		
Sceloporus occidentalis	Western Fence Lizard	
Crotalus oregonus	Western Rattlesnake	
Birds		
Anas platyrhynchos	Mallard	
Podilymbus podiceps	Pied-billed Grebe	
Ardea herodias	Great Blue Heron	
Ardea alba	Great Egret	
Butorides virescens	Green Heron	
Nycticorax nycticorax	Black-crowned Night-Heron	
Buteo jamaicensis	Red-tailed Hawk	
Falco sparverius	American Kestrel	
Rallus longirostris levipes	Light-footed Clapper Rail	FE, SE
Gallinula chloropus	Common Moorhen	
Fulica americana	American Coot	
Charadrius vociferus	Killdeer	
Zenaida macroura	Mourning Dove	
Calypte anna	Anna's Hummingbird	
Selasphorus sp.	Rufous/Allen's Hummingbird	
Picoides nuttallii	Nuttall's Woodpecker	
Empidonax difficilis	Pacific-slope Flycatcher	
Sayornis nigricans	Black Phoebe	
Tyrannus vociferans	Cassin's Kingbird	
Aphelocoma californica	Western Scrub-Jay	
Corvus brachyrhynchos	American Crow	
Corvus corax	Common Raven	
Stelgidopteryx serripennis	Northern Rough-winged Swallow	
Petrochelidon pyrrhonota	Cliff Swallow	
Hirundo rustica	Barn Swallow	
Psaltriparus minimus	Bushtit	
Thryomanes bewickii	Bewick's Wren	

Scientific Name	Common Name	Special Status
Cistothorus palustris	Marsh Wren	
Cistothorus palustris clarkae	Clark's Marsh Wren	CSC
**Sturnus vulgaris*	European Starling	
Dendroica petechia	Yellow Warbler	CSC
Geothlypis trichas	Common Yellowthroat	
Icteria virens	Yellow-breasted Chat	CSC
Pipilo maculatus	Spotted Towhee	
Pipilo crissalis	California Towhee	
Melospiza melodia	Song Sparrow	
Zonotrichia leucophrys	White-crowned Sparrow	
Agelaius phoeniceus	Red-winged Blackbird	
Euphagus cyanocephalus	Brewer's Blackbird	
Quiscalus mexicanus	Great-tailed Grackle	
**Molothrus ater*	Brown-headed Cowbird	
Icterus cucullatus	Hooded Oriole	
Carpodacus mexicanus	House Finch	
Carduelis psaltria	Lesser Goldfinch	
Carduelis tristis	American Goldfinch	
Mammals		
Sylvilagus audubonii	Desert Cottontail	
Spermophilus beecheyi	California Ground Squirrel	
Thomomys bottae	Botta's Pocket Gopher	
Canis latrans	Coyote	

Legend

*= Non-native or invasive species

Special Status:

Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened
CSC = Species of Special Concern
FPS = California Fully Protected Species

ATTACHMENT B

FIGURES

K: \ SAN_DIEGO \ PROJECTS \ CITY_OF_SAN_DIEGO \ 00333_09_EL_CAMINO_REAL \ MAPDOC \ FIG1_REGVIC.MXD TZ (09-23-09)

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Figure 1
Regional Vicinity

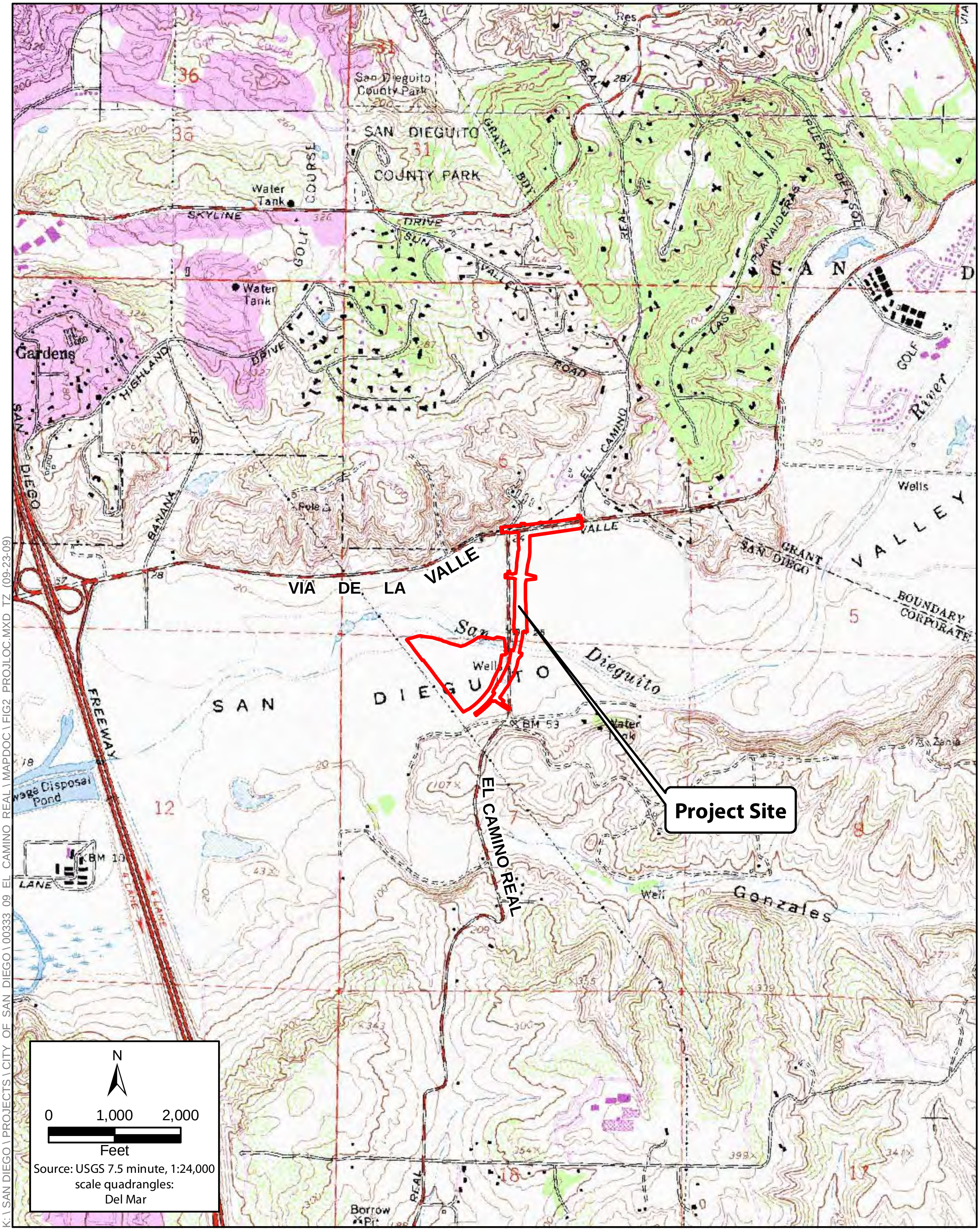

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Figure 2
Project Location

Appendix H
City of San Diego Biology Guidelines Consistency Summary

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City of San Diego
Biology Guidelines Consistency Summary

El Camino Real Bridge Replacement Project
San Diego, California

Caltrans District 11

Between Via de la Valle and San Dieguito Road

San Diego County, California

September 2012 Revised April 2015

ICF International. 2012 and revised April 2015. City of San Diego Biology Guidelines Consistency Summary. September. (ICF 333.09.) San Diego, California.

Contents

Tables and Figures

Acronyms and Abbreviations

BSA	Biological Survey Area
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
City	City of San Diego
decibels	dB
Department	California Department of Transportation's
DU	dwelling units
ESL	Environmentally Sensitive Lands
ft	feet
I-15	Interstate 15
I-5	Interstate 5
LOS	Level of Service
MF	multi-family
MHPA	Multiple Habitat Planning Area
MSCP	Multiple Species Conservation Program
NCFUA	North City Future Urbanizing Area
NES	Natural Environment Study
Project	El Camino Real Bridge Replacement Project
RWQCB	Regional Water Quality Control Board
sf	square feet
Tierra	Tierra Environmental Services
USACE	the U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VTM	vesting tentative map

Chapter 1
Introduction

1.1 Purpose of Report

The El Camino Real Bridge Replacement Project (Project) is located in the City of San Diego, in San Diego County, California. The site is located approximately 1.25 miles east of Interstate 5 (I-5) and is accessible from the east and west from Via de la Valle and from the south from Del Mar Heights Road. The Project includes two components: 1) widening a portion of El Camino Real extending from Via de la Valle to San Dieguito Road and 2) replacement of the bridge that crosses over the San Dieguito River approximately 0.3 mile south of the intersection of Via de la Valle and El Camino Real (Figures 1 and 2). The project site is located on the U.S. Geological Survey (USGS) Del Mar Quadrangle, Sections 6 & 7, Township 14 South, and Range 3 West.

A Natural Environment Study (NES) for the Project has been prepared pursuant to the California Department of Transportation's (Department) guidelines. The NES describes the existing biological environment and how the Project may affect that environment. It contains the technical analysis that lends support to environmental documentation concerning plants, wildlife, and natural communities that may be affected by the Project. The NES also includes an analysis of the JPA mitigation area (formerly the Boudreau property), which is the proposed mitigation site for the Project.

The City of San Diego is a responsible agency for the project. Because the project requires City approval, it also must comply with City of San Diego biological guidelines in the Land Development Code. Specifically, the project must conform to regulations that pertain to the Environmentally Sensitive Lands (ESL; Municipal Code, Chapter 14, Division 1, Section 143.0141) and the Open Space Residential Zone (OR-1-2; Municipal Code, Chapter 13, Division 2, Section 131.0230). These regulations provide guidance for development, including coastal development in the Coastal Overlay Zone. These regulations serve as standards for the determination of impacts and mitigation under the California Environmental Quality Act and the California Coastal Act.

The ESL regulations also facilitate the implementation of the Multiple Species Conservation Program (MSCP) by directing the conservation of biological resources within the Multi-Habitat Planning Area (MHPA) identified in the MSCP Subarea Plan. Through established mitigation ratios based on habitat value, the ESL regulations ensure habitat-based conservation thereby providing adequate protection for "covered species" included in the MSCP subarea plan.

In order to attain City approval, the project must conform to the City's ESL regulations found in the Biology Guidelines of the Land Development Code, as well as the MSCP Subarea Plan. The 2002 Land Development Code, Biology Guidelines, as contained within the City of San Diego Biological Review References, were considered appropriate as the project was deemed "substantially complete" by the City on April 25, 2002. The project must also conform to the California Environmental Quality Act (CEQA) and associated Significance Determination Thresholds. Typically, conformance with City requirements is addressed in a biological technical report prepared according to City guidelines.

The NES includes most of the information required by the City to determine the potential project effects on biological resources. Wherever relevant, the NES document is referenced in this report to assist City staff in project review. This document is an appendix to the NES and serves to provide supplemental information required by the City, but not included in the NES. In particular, Chapter 6 of this this document includes additional discussion of potentially occurring special-status covered species in order to demonstrate project compliance with the MSCP conditions of coverage. Chapter 6 also provides an analysis of biological impacts and mitigation relative to the California Environmental Quality Act and thresholds for significance as defined by the City.

1.2 Bicycle Safety and Road Capacity Alternatives

This document presents two additional project alternatives that have not been addressed in the NES: the bicycle safety alternative and the road capacity alternative. Survey results for these alternatives are presented in Chapter 4 of this document. Anticipated impacts to vegetation and jurisdictional areas resulting from each of these alternatives are presented in Chapter 5. Mitigation proposed for impacts associated with these alternatives are presented in Chapter 6.

1.3 Project History

The road being modified is the segment of El Camino Real that extends from Via de la Valle to San Dieguito Road. This portion of El Camino Real, classified as a 2-lane collector, is approximately 2,400 feet (ft) long, 23 ft wide, has one travel lane in each direction, and has no shoulders, bike lanes, or pedestrian walkways. The road segment includes a bridge over the San Dieguito River that is 340 ft long and 27 ft wide (24 ft wide curb to curb on the concrete travel surface, with 1.5-foot wide raised concrete curbs on each side). The bridge is not high enough to accommodate the 100-year flood. The City of San Diego (City) proposes to modify this segment of El Camino Real and replace the bridge in order to improve the structural integrity of the bridge over the San Dieguito River, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, relieve traffic congestion, and improve consistency with the adopted land use plan in the project area.

The affected portion of El Camino Real is situated within the northwestern part of the North City Future Urbanizing Area (NCFUA), a diverse planning area that extends from I-5 on the west to Interstate 15 (I-15) on the east, and from Los Peñasquitos Canyon on the south to Santa Fe Valley on the north. The NCFUA Framework Plan (City of San Diego 1995) was initially adopted by the City Council in 1992 as an amendment to the General Plan in effect at that time. The Framework Plan includes guiding principles, which are broad goal or policy statements to be used in evaluating future planning efforts in the NCFUA. The Framework Plan also contains implementing principles, which are more specific standards or criteria intended to implement the guiding principles. The implementing principles may be supplanted by zoning after new zones have been applied to the NCFUA. City zoning and the Framework Plan are the governing land use documents for the project area.

The Framework Plan designates El Camino Real as a four-lane Major Arterial with a Level of Service (LOS) of B. However, El Camino Real is currently a two-lane collector operating at LOS F. Therefore, this project proposes modifications to improve compatibility with the approved planning documents for the area in terms of road classification and LOS. El Camino Real is identified on the 2008 City of San Diego General Plan Land Use and Street System Map.

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Figure 1
Biological Resources Road Capacity Alternative
El Camino Real Bridge Replacement Project

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Figure 2
Biological Resources Bicycle Safety Alternative
El Camino Real Bridge Replacement Project

In 2006, an NES was prepared by Tierra Environmental Services (Tierra). That NES addressed the central, western, and eastern alternatives, in addition to a lower elevation alternative, a road capacity alternative, and a bicycle safety alternative. In 2009, the City requested that biological studies be updated for this Project due to the three year lapse since the last studies had been performed. This is addressed in Section 2.2. After the biological studies were updated in 2009, the Project was put on hold in order to redesign the proposed alternatives. The redesign of the alternatives was completed in 2011 and the western alternative, central alternative, eastern alternative, and the roundabout alternative are analyzed in the 2012 NES as revised in 2014.

In summary, alternatives considered for the El Camino Real Bridge Replacement Project have included the central alternative, road capacity alternative, bicycle safety alternative, western alternative, eastern alternative, roundabout alternative, and lower elevation alternative. It should be noted that two alternatives are not considered viable by Caltrans/FHWA because they do not provide all features needed to completely meet the purpose and need. These are the road capacity alternative and the bicycle safety alternative. The City would not be able to receive federal funds if either of those alternatives was chosen, and the two alternatives are not analyzed in the NES. Therefore, four alternatives were analyzed in the NES: central alternative, western alternative, eastern alternative, and roundabout alternative. In addition, the lower elevation alternative is not analyzed separately in the NES, because it has the same configuration and impacts as the central alternative.

1.4 Project Site Location

See Chapter 1 and Figures 1 and 2 for a description and illustration of the project site location.

1.5 Project Description

Section 1.2.1 of the NES provides a description of the eastern, western, central, and roundabout project alternatives. As stated previously, the redesigned project analyzed in the 2012 NES did not include the road capacity alternative and the bicycle safety alternative. Figure 3 depicts the project footprint of each alternative alignment. As stated previously, the lower elevation alignment is identical to the central alternative and, thus, is not depicted in Figure 3. The road capacity and bicycle safety alternatives are described below and depicted in Figures 1 and 2.

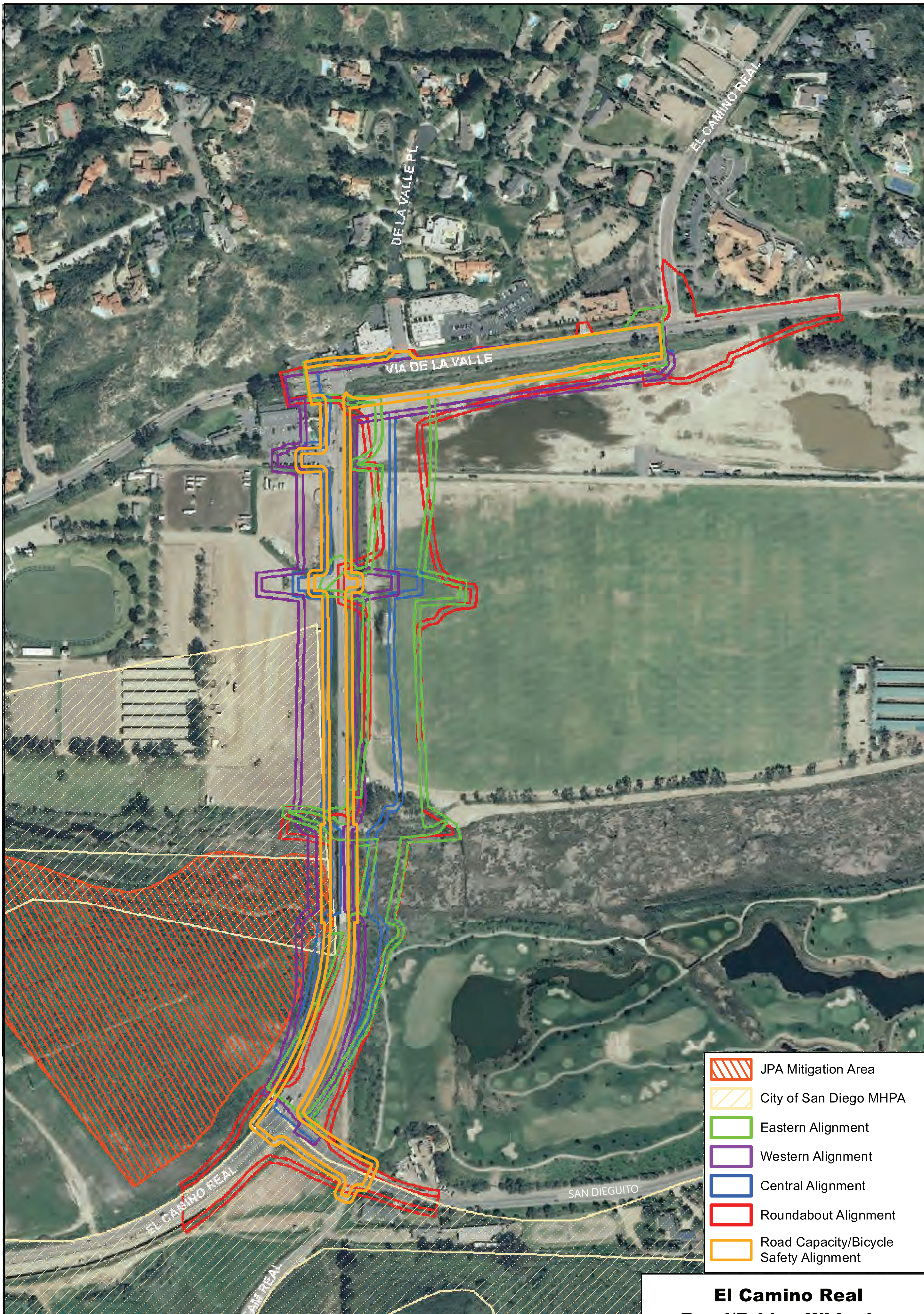
1.5.1 Road Capacity Alternative

The road capacity alternative would feature four travel lanes and a narrow painted (striped) median. This alternative would not provide pedestrian walkways, a parkway, or bicycle lanes. The roadway cross section for this alternative would have two 3-foot-wide graded shoulders, two 14-foot-wide outside travel lanes, two 12-foot-wide inside travel lanes, and a 2-foot-wide median. The total width for the road capacity alternative would be 60 feet.

1.5.2 Bicycle Safety Alternative

The bicycle safety alternative would feature two travel lanes, bicycle lanes and a raised central median. This alternative would not provide pedestrian walkways, a parkway, or additional travel lanes to increase road capacity. For this alternative, the roadway cross section would have two 3-foot-wide graded shoulders, two 8-foot-wide bicycle lanes, two 12-foot-wide inside travel lanes, and a 14-foot-wide raised median. The total width for the bicycle safety alternative would be 60 feet.

Map Source: Caltrans



El Camino Real
Road/Bridge Widening

Proposed Project
Alternatives El Camino Real-
Bridge Replacement Project

Figure
3

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Chapter 2
Regulatory Framework

2.1 Wetlands

Chapter 2 of the NES provides detailed information on the regulatory requirements relevant to the proposed project. Sections 2.1.1 and 2.1.2 of the NES discuss federal and state wetland regulations. Impacts to each habitat type and the mitigation proposed to offset these impacts are discussed in Chapter 4 of the NES. The following information is provided in this appendix to address regulations specific to the City of San Diego.

Wetlands in the City of San Diego are regulated according to the ESL regulations of the Municipal Code. Those regulations define wetlands as areas that meet one of the following criteria:

- Areas that support naturally occurring wetland vegetation communities characteristically dominated by hydrophytic vegetation, including salt marsh, brackish marsh, freshwater marsh, riparian forest, oak riparian forest, riparian woodland, riparian scrub, and vernal pools;
- Areas that support hydric soils or wetland hydrology but lack naturally occurring wetland vegetation communities due to past or present human activities that have removed the historic wetland vegetation, or catastrophic or recurring natural events or processes that have precluded the establishment of wetland vegetation;
- Areas lacking wetland vegetation communities, hydric soils, and wetland hydrology due to non-permitted filling of previously existing wetlands; or
- Areas previously mapped as wetland on Diagram 132-06A, a reproduction of Map No. C-713 shown in Chapter 13, Article 2, Division 6 (Sensitive Coastal Overlay Zone) of the Municipal Code.

Except for created wetlands, open water, or the purposeful alteration of natural stream courses, artificially created areas demonstrating wetland characteristics are not considered wetlands.

Under the ESL regulations, impacts to wetlands should be avoided. Unavoidable impacts should be minimized to the maximum extent possible. Direct permanent and temporary impacts to wetlands regulated under the ESL ordinance are considered significant and must be mitigated.

In general, mitigation for wetland impacts must be accomplished through 1:1 restoration or creation in order to achieve no-net-loss of wetlands. Remaining mitigation may consist of enhancement or acquisition. In addition, mitigation provided for unavoidable wetland impacts will be accomplished at ratios determined by the location of impact (City of San Diego 2004). Ratios vary for impacts that occur inside or outside of the Coastal Overlay Zone, or inside or outside of the MHPA. Habitats occurring west of El Camino Real are situated in the City of San Diego Coastal Overlay Zone. For the purposes of this report, the project area is considered entirely within the Coastal Overlay Zone. This is discussed in Section 4.2 of the NES.

Wetland impacts and mitigation for the central, western, eastern and roundabout alternatives are discussed in Chapter 4 in the NES. Wetland impacts and mitigation associated with the road capacity alternative and the bicycle safety alternative are presented in Chapter 5 of this report. Applicable mitigation ratios are also presented in Chapter 5.

In some cases, mitigation is proposed at ratios that are lower than the City's guidelines. Such accounting has been proposed for impacts associated with conversion of isolated and degraded wetlands located within the JPA's mitigation site to high quality wetlands. The City's 2002 guidelines call for mitigation ratios for wetland impacts ranging from 2:1 to 4:1; however, the 2002 guidelines allow that state and federal resource agencies may override City guidelines. All state and federal regulatory agencies involved with the mitigation plan have agreed that a 1:1 mitigation ratio at the JPA mitigation site is acceptable. Detailed discussion of proposed mitigation, including ratios that exceed City guidelines, is presented in Chapter 4 of the NES.

2.2 Multiple Species Conservation Program

The MSCP is a regional conservation program designed to facilitate the implementation of a regional habitat preserve by coordinating project impacts and mitigation while allowing the issuance of "take" permits for sensitive upland species at the local level (City of San Diego 1997). This habitat preserve is known as the MHPA and lands within it have been designated for conservation. The City of San Diego has developed a MSCP Subarea plan to direct the management of the MHPA and the ESL regulations, found in the municipal code, serve as the implementing document for the subarea plan. The ESL regulations provide specific guidelines for activities that affect biological resources within the preserve. In particular, these guidelines address upland impacts within and outside of the MHPA.

Project conformance with the ESL regulations and the MSCP is discussed in Section 5.14 of the NES. That discussion addresses project conformance with MSCP guidelines specific to the Northern area of the MSCP, land use considerations listed in the subarea plan, land use adjacency guidelines, and the framework management plan.

2.3 CEQA Significance Criteria and Thresholds

The City of San Diego provides thresholds for the determination of "substantial" effects on biological resources, or significant project impacts. Before a determination of significance of an impact can be made, the presence and nature of the biological resources must be established. An affirmative answer to the following questions indicated that significant biological resources may be present (*City of San Diego CEQA Significance Determination Thresholds*, Development Services Department, January 2011 [www.sandiego.gov/development-services/news/pdf/sdtcequa.pdf]):

- Has the site been identified as part of the MHPA by the City's MSCP Subarea Plan?
- Does or could the site support Tier I, II, IIIA or B vegetation communities (such as grassland, chaparral, coastal sage scrub)?
- Does the site contain or come within 100 feet of a natural or manufactured drainage? Does it occur within a 100-year floodplain established by the Federal Emergency Management Agency (FEMA)?
- Could wildlife species listed as threatened or endangered or protected use the site?

After assessing the presence of significant biological resources, direct, indirect and cumulative impacts then must be analyzed for significance. Direct, indirect and cumulative impacts are analyzed for significance in Section 5.1.5 of this report.

Impacts to biological resources also must be analyzed to determine whether they are significant under CEQA. According to the City's CEQA Significance Determination Thresholds, a proposed project may have a significant effect on sensitive biological resources if it would result in any of the following:

1. A substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in the MSCP or other local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS),
2. A substantial adverse impact on any Tier I Habitats, Tier II Habitats, Tier IIIA Habitats, or Tier IIIB Habitats as identified in the Biology Guidelines of the Land Development manual or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS,
3. A substantial adverse impact on wetlands (including, but not limited to, marsh, vernal pool, riparian, etc.) through direct removal, filling, hydrological interruption, or other means,
4. Interfering substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, including linkages identified in the MSCP Plan, or impede the use of native wildlife nursery sites?
5. A conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan, either within the MSCP plan area or in the surrounding region?
6. Introducing land use within an area adjacent to the MHPA that would result in adverse edge effects?
7. A conflict with any local policies or ordinances protecting biological resources?
8. An introduction of invasive species of plants into a natural open space area?

These significance criteria are addressed in Chapter 6 of this document.

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Chapter 3
Study Methods

Chapter 2.0 of the NES includes a discussion of study methods used in support of the Project. A discussion of regulations that apply to the biological resources associated with the project area is provided, and followed by a description of general and focused field surveys, including survey conditions and personnel, conducted for the project.

All study methods for all six alternatives conformed to City requirements including general habitat surveys, jurisdictional delineations, and special-status plant and animal surveys. Biological studies conducted in support of this project included an assessment of the project area for sensitive species with potential to occur within the study area as indicated by the California Natural Diversity Data Base.

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Chapter 4
Results

Chapter 3.0 of the NES includes a discussion of the existing biological and physical conditions observed in the Biological Survey Area (BSA). As stated in the NES, the general BSA consists of the limits of disturbance required for the western, eastern, central and roundabout alternatives and the proposed JPA mitigation area. The BSA also includes the limits of disturbance required for the road capacity and bicycle safety alternatives.

Sections 3.1.1 and 3.1.2 of the NES describe the physical attributes of the study site and the elevation and soils in the BSA. Section 3.1.3 of the NES describes the Biological Conditions of the Study Area including a description of vegetation communities that exist in the BSA, plant and wildlife species observed during surveys of the BSA, and a discussion of wildlife movement corridors. Appendices A and B of the NES provide lists of plant and wildlife species observed in the BSA.

Section 3.2 of the NES addresses regional species and habitats of concern. Appendix A of the NES summarizes plant species that have been observed within the BSA. Appendix B of the NES summarizes wildlife species that have been observed within the BSA. Appendix C provides a list of special-status plant and wildlife species, their requirements and likelihood of occurrence in the BSA.

The following discussion presents the results of biological surveys conducted within the limits of disturbance for the road capacity and bicycle safety alternatives.

4.1 Road Capacity Alternative

4.1.1 Vegetation

The following vegetation communities were observed within the road capacity alternative: developed, disturbed, disturbed coastal freshwater marsh, disturbed Diegan coastal sage scrub, disturbed mule-fat scrub, disturbed southern coastal salt marsh, disturbed southern willow scrub, freshwater marsh, ornamental, and mule-fat scrub. Figure 1 depicts the vegetation communities associated with the road capacity alternative.

4.1.2 Plant and Wildlife Species

Plant and wildlife species observed during surveys of the road capacity alternative were the same as those observed during surveys of the central, eastern, western and roundabout alternatives.

4.1.3 Special Status Species

Several special status species were observed within the limits of disturbance proposed for the road capacity alternative. These included Clark's marsh wren (*Cistothorus palustris clarkae*), four individual Palmer's sagewort (*Artemisia palmeri*), and two individual San Diego sunflower (*Bahiopsis laciniata*). The locations of these individuals are depicted in Figure 1. In addition, all areas supporting coastal freshwater marsh in the BSA are considered occupied by light-footed clapper rail (*Rallus longirostris levipes*) and all areas supporting disturbed southern willow scrub occurring in association with the San Dieguito River are considered occupied by least Bell's vireo (*Vireo bellii pusillus*).

4.2 Bicycle Safety Alternative

The bicycle safety alternative included the following vegetation communities: developed, disturbed, disturbed coastal freshwater marsh, disturbed southern coastal salt marsh, disturbed mulefat scrub, disturbed southern willow scrub, freshwater marsh, disturbed Diegan coastal sage scrub, ornamental and mule-fat scrub. Figure 2 depicts the vegetation communities associated with the Bicycle Safety Alternative.

4.2.1 Plant and Wildlife Species

Plant and wildlife species observed during surveys of the Bicycle Safety Alternative were the same as those observed during surveys of the central, eastern, western and roundabout alternatives.

4.2.2 Special-Status Species

Several special-status species were observed within the limits of disturbance proposed for the Bicycle Safety Alternative. These included Clark's marsh wren, four individual Palmer's sagewort, and two individual San Diego sunflower. The locations of these individuals are depicted in Figure 2. In addition, all areas supporting coastal freshwater marsh in the BSA are considered occupied by light-footed clapper rail and all areas supporting disturbed southern willow scrub occurring in association with the San Dieguito River are considered occupied by least Bell's vireo (*Vireo bellii pusillus*).

Chapter 5
Impacts and Mitigation

5.1 Impacts

Anticipated impacts from the central, eastern, western, and roundabout alternatives, recommended compensatory mitigation, and the potential for cumulative effects are presented in Chapter 4 of the NES. All anticipated impacts associated with the Road Capacity and Bicycle Safety Alternatives are presented in this section. Mitigation for these impacts is presented in Section 5.2 of this report.

5.1.1 Impacts to Sensitive Vegetation Communities

Section 4.1 of the NES describes the ecological value of all sensitive vegetation communities in the project area. Disturbed southern willow scrub, mule-fat scrub, disturbed mule-fat scrub, coastal freshwater marsh, disturbed coastal freshwater marsh, southern coastal salt marsh, disturbed wetland, and tamarisk scrub would be considered sensitive wetland habitats ranging from low to high ecological value.

Disturbed Diegan coastal sage scrub is designated as a Tier II vegetation community by the City of San Diego. Impacts to sensitive vegetation communities resulting from the eastern, western, central and roundabout alternatives and the JPA mitigation site are summarized in the following tables of the NES: Table 4-1 western alignment page 75 of the NES; Table 4-2 central alignment page 77 of the NES; Table 4-3 eastern alignment page 79 of the NES; Table 4-4 roundabout alignment page 81 of the NES. Impacts to sensitive vegetation communities resulting from the road capacity and bicycle safety alternatives are described below.

Road Capacity Alternative

The Road Capacity Alternative would result in impacts to 0.0884 acre of disturbed southern willow scrub, 0.0219 acre of disturbed mulefat scrub, 0.4566 acre of coastal freshwater marsh, 0.3308 acre of disturbed coastal freshwater marsh, 1.046 acre of disturbed southern coastal salt marsh, 0.0338 acre of tamarisk scrub, 0.0018 acre of disturbed wetland 0.4449 acre of disturbed Diegan coastal sage scrub. The NES considers all impacts to be permanent due to temporal loss of habitat during protracted construction (2-3 years).Table 1 summarizes anticipated impacts and mitigation proposed for the road capacity alternative.

Table 1. Project Impacts to Vegetation Communities Associated with the Road Capacity Alternative

Vegetation Community	Total Impacts	Mitigation Ratio	Mitigation Requirement	Proposed Mitigation
Disturbed Southern Willow Scrub	0.0884	3:1	0.2652	0.2652
Disturbed Mulefat Scrub	0.0219	3:1	0.0657	0.0657
Freshwater Marsh	0.4539	4:1	1.8156	1.8156
Freshwater Marsh (within the Fairbanks Mitigation Area)	0.0027	4:1	0.0108	0.0108
Disturbed Coastal Freshwater Marsh	0.3308	4:1	1.3232	1.3232
Disturbed Southern Coastal Salt Marsh	1.0460	4:1	4.184	4.184
Tamarisk Scrub	0.0338	2:1	0.0676	0.0676
Disturbed Wetland	0.0018	2:1	0.0036	0.0036
Total Wetland Impacts	**1.98**		**7.7357**	**7.7357**
Disturbed Diegan Coastal Sage Scrub	0.449	1:1	0.449	0.449
Disturbed	2.19	N/A	--	--
Ornamental	0.71	N/A	--	--
Developed	5.74	N/A	--	--
TOTALS	**11.069**		**8.1847**	**8.1847**

Bicycle Safety Alternative

The Bicycle Safety Alternative would result in impacts to 0.0884 acre of disturbed southern willow scrub, 0.0219 acre of disturbed mulefat scrub, 0.4566 acre of coastal freshwater marsh, 0.3308 acre of disturbed coastal freshwater marsh, 1.046 acre of disturbed southern coastal salt marsh, 0.0338 acre of tamarisk scrub, 0.0018 acre of disturbed wetland 0.4449 acre of disturbed Diegan coastal sage scrub. The NES considers all impacts to be permanent due to temporal loss of habitat during protracted construction (2-3 years).Table 2 summarizes anticipated impacts and mitigation proposed for the bicycle safety alternative.

Table 2. Project Impacts to Vegetation Communities Associated with the Bicycle Safety Alternative

Vegetation Community	Total Impacts	Mitigation Ratio	Mitigation Requirement	Proposed Mitigation
Disturbed Southern Willow Scrub	0.0884	3:1	0.2652	0.2652
Disturbed Mulefat Scrub	0.0219	3:1	0.0657	0.0657
Freshwater Marsh	0.4539	4:1	1.8156	1.8156
Freshwater Marsh (within the Fairbanks Mitigation Area)	0.0027	4:1	0.0108	0.0108
Disturbed Coastal Freshwater Marsh	0.3308	4:1	1.3232	1.3232
Disturbed Southern Coastal Salt Marsh	1.0460	4:1	4.184	4.184
Tamarisk Scrub	0.0338	2:1	0.0676	0.0676
Disturbed Wetland	0.0018	2:1	0.0036	0.0036
Total Wetland Impacts	**1.98**		**7.7357**	**7.7357**
Disturbed Diegan Coastal Sage Scrub	0.449	1:1	0.449	0.449
Disturbed	2.19	N/A	--	--
Ornamental	0.71	N/A	--	--
Developed	5.74	N/A	--	--
TOTALS	**11.069**		**8.1847**	**8.1847**

5.1.2 Jurisdictional Habitats

Appendix D of the NES includes a jurisdictional delineation report prepared to assess the limits of federal and state jurisdiction within and adjacent to the proposed project site. The jurisdictional delineation report describes the resources subject to regulation by the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), CDFG, and the City of San Diego.

Unavoidable impacts to resources under the jurisdiction of the USACE, RWQCB, and CDFG will require additional approval and permits from these agencies and implementation of associated mitigation measures. This delineation will support the resource-agency permitting process by providing a summary of jurisdictional wetlands associated with the western, central, eastern, and roundabout alternatives. Impacts to those wetlands are presented in Table 4-6 in Section 4.2 of the NES.

Table 3 summarizes impacts to jurisdictional habitats associated with the road capacity and bicycle safety alternatives. Jurisdictional areas associated with the road capacity and bicycle safety alternatives are presented in Figures 4 and 5.

Table 3. Project Impacts to Jurisdictional Habitats Associated with the Bicycle Safety and Road Capacity Alignments

Jurisdictional Area	Impacts (Permanent/Temporary)	
	Bicycle Safety (acres)	Road Capacity (acres)
USACE/RWQCB		
Wetland waters of the U.S.	0.71/0.32	0.71/0.32
Adjacent Wetland	0.57/0.40	0.57/0.40
Non-wetland waters of the U.S.	0/0	0/0
TOTAL USACE/RWQCB Jurisdictional Impacts	**1.28/0.72**	**1.28/0.72**
CDFG/City of San Diego		
CDFG state streambed	0.71/0.32	0.71/0.32
CDFG riparian habitat	0.62/0.48	0.62/0.48
TOTAL CDFG/City of San Diego Jurisdictional Impacts	**1.33/0.80**	**1.33/0.80**

Road Capacity Alternative

The road capacity alternative would result in permanent impacts to 1.28 ac and temporary impacts to 0.72 ac of USACE/RWQCB jurisdictional areas. This includes permanent impacts to 0.71 ac and temporary impacts to 0.32 ac of wetland waters of the U.S. and permanent impacts to 0.57 ac and temporary impacts to 0.40 ac of adjacent wetlands.

The road capacity alternative would also result in permanent impacts to 1.33 ac and temporary impacts to 0.80 ac of CDFG jurisdictional areas. This includes 0.71 ac of permanent impacts and 0.32 ac of temporary impacts to CDFG state streambed and 0.62 ac of permanent impacts and 0.48 ac of temporary impacts to CDFG riparian habitat.

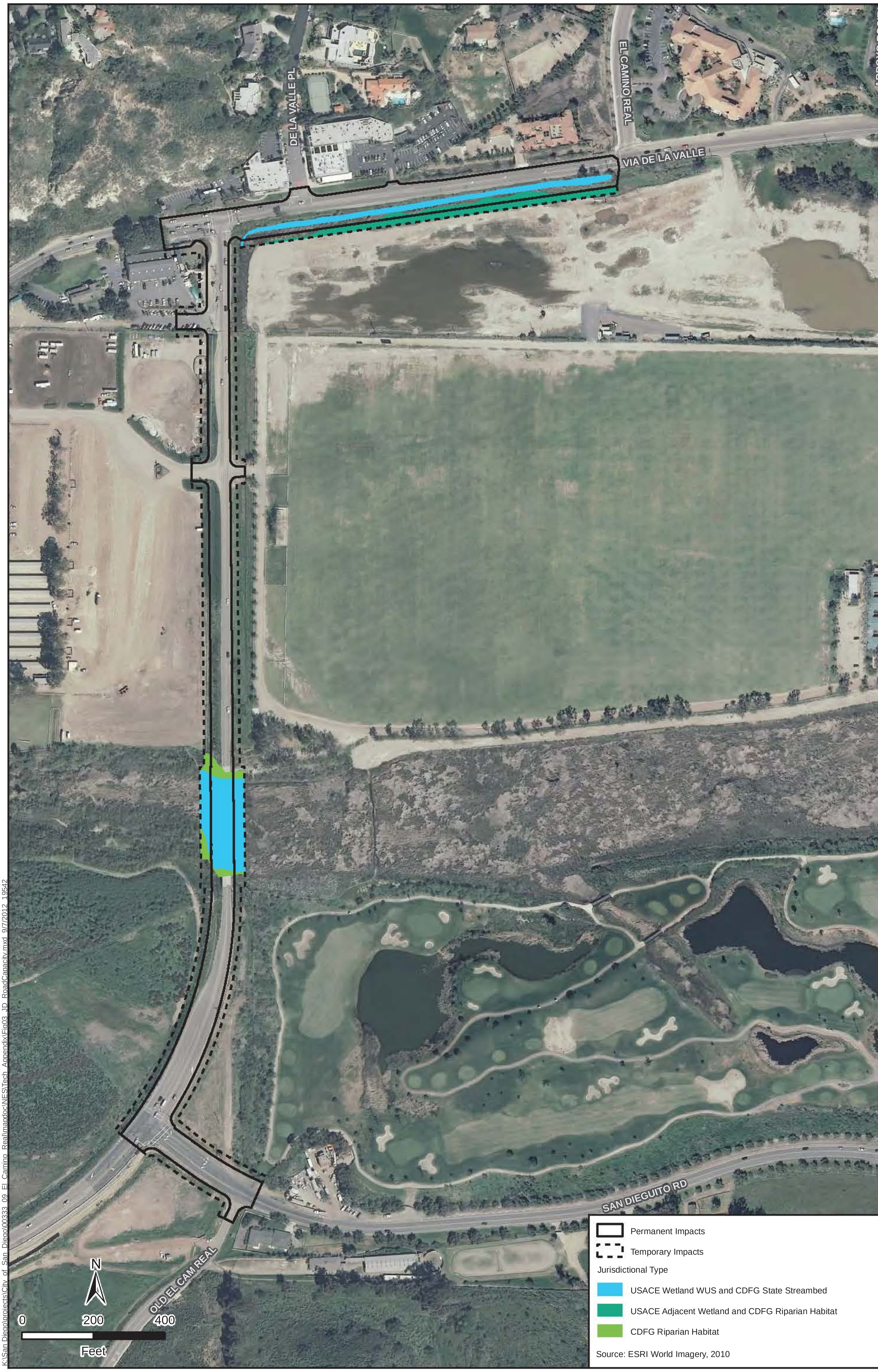
Bicycle Safety Alternative

The road capacity alternative would result in permanent impacts to 1.28 ac and temporary impacts to 0.72 ac of USACE/RWQCB jurisdictional areas. This includes permanent impacts to 0.71 ac and temporary impacts to 0.32 ac of wetland waters of the U.S. and permanent impacts to 0.57 ac and temporary impacts to 0.40 ac of adjacent wetlands.

The road capacity alternative would also result in permanent impacts to 1.33 ac and temporary impacts to 0.80 ac of CDFG jurisdictional areas. This includes 0.71 ac of permanent impacts and 0.32 ac of temporary impacts to CDFG state streambed and 0.62 ac of permanent impacts and 0.48 ac of temporary impacts to CDFG riparian habitat.

5.1.3 Impacts to Special-Status Plant Species

Chapter 4 of the NES provides the results of the habitat evaluations, focused survey work, and relevant regulatory analysis. During surveys conducted in 2009 and 2011, four special-status plant species were detected in or immediately adjacent to the BSA including: Palmer's sagewort (*Artemisia palmeri*), San Diego sunflower (*Bahiopsis laciniata*), San Diego marsh-elder (*Iva*



ICF INTERNATIONAL

Figure 4
Jurisdictional Areas Road Capacity Alternative
El Camino Real Bridge Replacement Project

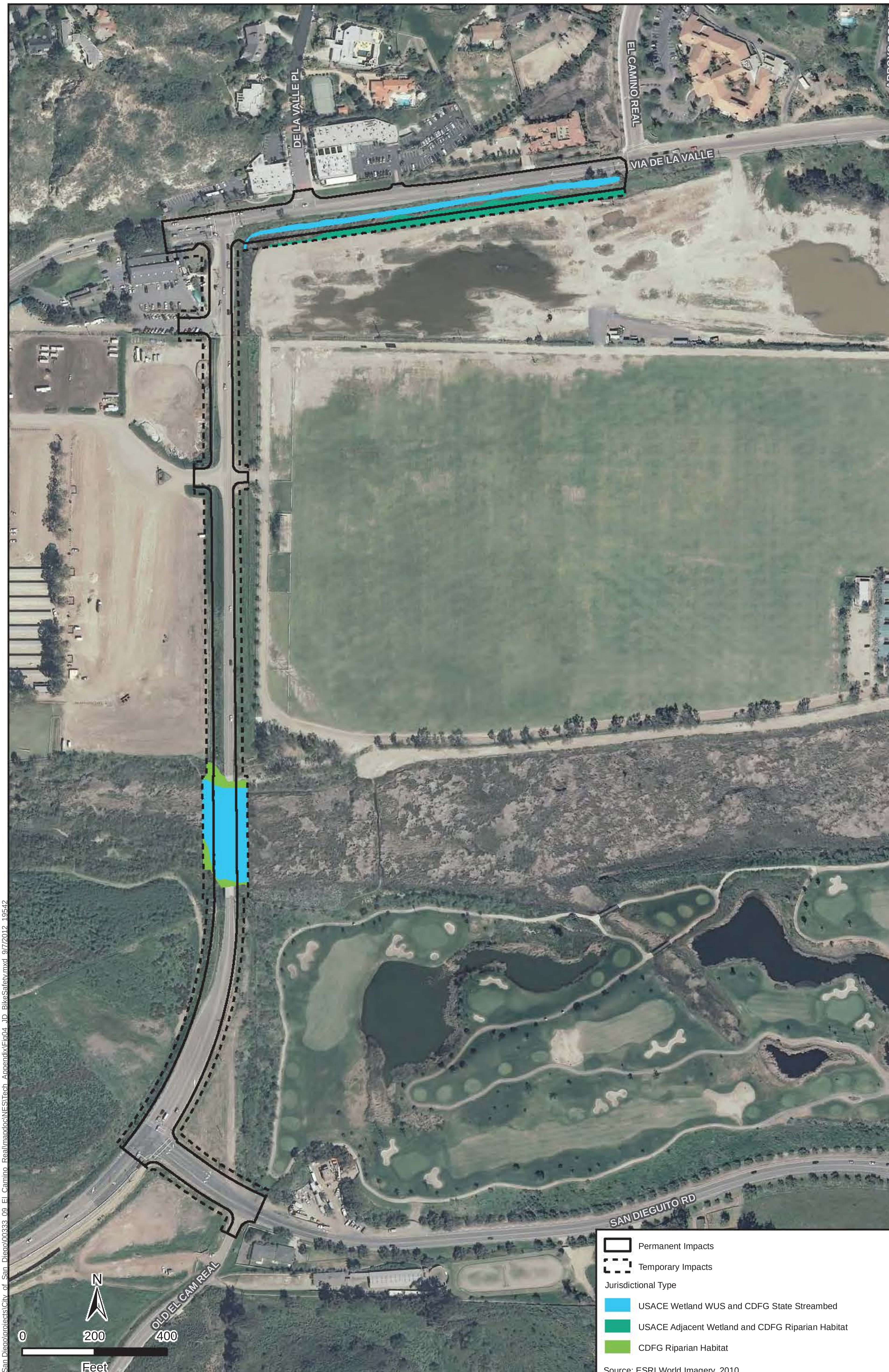


Figure 4
Jurisdictional Areas Bicycle Safety Alternative
El Camino Real Bridge Replacement Project

hayesiana), and southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*). Section 4.3 of the NES also presents avoidance and minimization measures and compensatory mitigation to offset impacts to each species.

Road Capacity and Bicycle Safety Alternatives

Four Palmer's sagewort and two individuals of San Diego sunflower were detected within the BSA for the Road Capacity and Bicycle Safety Alternatives. Impacts to these species would result from implementation of each of these proposed alternatives. However, these individuals found within the BSA are not considered regionally important populations. The loss of these plants will not threaten the long-term survival of this species in the region or within the MSCP subarea. Therefore, no significant impacts to special-status plant species will occur from the project and the City's thresholds under CEQA will not be exceeded.

5.1.4 Impacts to Special-Status Wildlife Species

Chapter 4 of the NES provides the results of the habitat evaluations, focused survey work, and relevant regulatory analysis. During surveys conducted in 2009 and 2011, seven special-status wildlife species were detected in or immediately adjacent to the BSA including: northern harrier (*Circus cyaneus*), Clark's marsh wren (*Cistothorus palustris clarkae*), yellow warbler (*Dendroica petechia*), white-tailed kite (*Elanus leucurus*), yellow-breasted chat (*Icteria virens*), light-footed clapper rail (*Rallus longirostris levipes*), and least Bell's vireo (*Vireo bellii pusillus*). A detailed discussion of indirect impact to these species resulting from the western, central, eastern, and roundabout alternatives are provided in Section 4.4 of the NES. No direct impacts to wildlife species are anticipated from any of these four alternatives. Indirect impacts associated with the four proposed project alternatives would be considered significant but mitigable through the implementation of avoidance and minimization measures described in Chapter 4 of the NES and Section 5.2 of this document.

Road Capacity and Bicycle Safety Alternatives

Clark's marsh wren was detected within freshwater marsh habitat associated with the BSA for the Road Capacity and Bicycle Safety Alternatives. Although light-footed clapper rail and least Bell's vireo were not detected within the BSA for these two alignments, all areas of coastal freshwater marsh in the BSA are considered occupied by light-footed clapper rail and all disturbed southern willow scrub in the San Dieguito River is considered occupied by least Bell's vireo. No direct impacts to any of these three special-status species are anticipated.

Indirect impacts to seven special-status wildlife species would result through disturbance to vegetation communities that serve as potential nesting and foraging habitat. For the Road Capacity and Bicycle Safety Alternatives, impacts to coastal freshwater marsh would result in indirect impacts to Clark's marsh wren and light-footed clapper rail. Impacts to disturbed southern willow scrub would result in indirect impacts to least Bell's vireo. In addition, disturbed southern willow scrub provides suitable habitat for yellow warbler and yellow-breasted chat, both of which were detected within the BSA. Impacts to disturbed southern willow scrub would also be considered indirect impacts to both of these species.

No direct impacts to wildlife species are anticipated from any of the four alternatives. Indirect impacts associated with the six proposed project alternatives would be considered significant but mitigable through the implementation of avoidance and minimization measures described in Chapter 4 of the NES and Section 5.2 of this document.

5.1.5 Cumulative Impacts

As discussed in Chapter 4 of the NES, no potential adverse cumulative project impacts to the vegetation communities are anticipated from the central, western, eastern or roundabout alternatives. Table 4 below presents a list of projects approved or pending in the vicinity of the Project.

Table 4. List of Cumulative Projects

Project	Description	Status
Flower Hill Promenade	Adding 8,754 square feet (sf) of retail; 2,300 sf of storage; 28,927 sf of office; and 35,000 sf of market.	Approved
22nd District Agricultural Master Plan	Replace existing flat floor exhibit bldg. (add 26,220 sf); pave east parking lot; new 60,000 sf health club; Solana gate improvement; rooftop sports field; conference hotel.	Approved
Black Mountain Ranch (BMR)	The 3,690 acre BMR vesting tentative map (VTM) includes 2 golf courses; 1,212 dwelling units; parks, schools, fire station, etc. An additional 1,408 acres of new development are included in BMR.	Approved
Morgan Run Country Club	Health spa: 9,432 sf increase.	Approved
Palma de la Reina	54 apt.; 19,500 sf office; and 9,500 sf retail.	Approved
Rancho Santa Fe Farms Golf Club	Recreational 18 hole golf course.	Approved
Pueblo de la Valle	(aka: Vial de la Valle Townhomes) 22 townhomes.	Pending
Rancho del Mar	225 senior housing units.	Pending
One Paseo	245,000 sf corporate office; 291,000 sf multi-tenant office; 150 room hotel; 220,000 sf community shopping center; 10 screen cinema; 608 multi-family (MF) dwelling units (DU)	Pending
Riverview Project	23,120 sf office	Pending
Sillstrop Single Family Homes	3 apartments and 22 homes.	Pending
Solana Beach Towne Center	Office alternative 133,047 sf.	Pending
Solana Beach Mixed-Use Project	Mixed use.	Pending
NCTD Mixed-Use	Mixed use.	Pending
Stevens Avenue Office Bldg.	18,905 sf offices.	Pending
Shepard Medical Center	Medical office: 4,394 sf.	Pending
Solana Gateway	Mixed use: Hotel, restaurant, residential	Pending
Helen Woodward Animal Center	Building expansion: 41,600 sf.	Pending
Del Mar Country Estates	Residential: 14 estate homes	Pending
St. John Garabed Church	350 seat church, 500 seat multi-purpose hall, education building & gymnasium with reduced setbacks for a total of 51,680 square feet on a 13.57 acre site	Pending

Although the projects listed in Table 4 would have impacts in the project vicinity, significant cumulative effects from the six project alternatives are not anticipated. Wetland impacts associated with the proposed project would be mitigated at ratios necessary to achieve no-net-loss of wetlands. Upland impacts are offset by mitigation provided in accordance with the ESL regulations of the Biology Guidelines. These regulations direct the implementation of the MSCP that was developed specifically to coordinate development of upland areas within the City. By delineating the MHPA area and directing mitigation requirements inside and outside of that preserve area, the MSCP facilitates the avoidance of cumulative impacts to upland habitats. Thus, conformance with the City of San Diego Land Development Code and the MSCP ensures that cumulative impacts from the proposed project will be avoided. Similarly, the Road Capacity Alternative and Bicycle Safety alternatives are not expected to contribute to adverse cumulative effects to sensitive habitats.

5.2 Mitigation

5.2.1 Mitigation for Sensitive Vegetation Communities

As described in Chapter 4 of the NES, impacts will be avoided to the extent possible and minimized where impacts are unavoidable. Chapter 4 provides a discussion of compensatory mitigation proposed for project related impacts to sensitive vegetation communities. Diegan Coastal sage scrub is considered a Tier II Sensitive Upland Habitat by the City of San Diego and within the BSA is of low ecological value. Mitigation for impacts to this vegetation community would be accomplished at a 1:1 ratio according to City of San Diego Tier II Sensitive Upland mitigation requirements. This will be achieved through purchase of credits from the City's Cornerstone Lands. The City currently proposes to mitigate the project's impacts to jurisdictional resources through implementation of a wetland creation/enhancement plan at the JPA mitigation site. The mitigation plan within the JPA mitigation area does not include enough area to mitigate for all impacts to marsh habitats under the roundabout alternative. The Roundabout Alternative would require an additional 6.48 acres of wetland mitigation beyond the JPA mitigation site. The City of San Diego owns a parcel in Gonzales Canyon immediately south of the JPA mitigation site and south of El Camino Real that is considered suitable for mitigation, through a combination of creation and enhancement on up to 10.8 acres. A Memorandum of Understanding is in process should it become necessary to proceed with this additional mitigation. Details on this additional wetland creation and enhancement are presented in Chapter 4 of the NES. Implementation of the plan and additional mitigation measures would ensure no net loss to jurisdictional resources and would result in a net gain of jurisdictional resources such that the required mitigation measures. Section 4.2 of the NES presents mitigation for wetland impacts anticipated for the central, western, eastern and roundabout alternatives. Project impacts from these four alternatives would be considered significant but mitigable.

Road Capacity and Bicycle Safety Alternatives

Mitigation for impacts to 0.449 acre of disturbed Diegan coastal sage scrub resulting from both the proposed Road Capacity Alternative and Bicycle Safety Alternative will be provided at a 1:1 ratio through purchase of credits from the City's Cornerstone Lands.

The proposed mitigation for impacts to wetland habitats, including disturbed southern willow scrub, disturbed mule-fat scrub, coastal freshwater marsh, disturbed coastal freshwater marsh, disturbed southern coastal salt marsh, and tamarisk scrub would provide through creation at a minimum of a 1:1 ratio, and through enhancement of wetlands such that no-net-loss of wetlands would be achieved. Thus, Project impacts from the road capacity and bicycle safety alternatives would be considered significant but mitigable.

Mitigation provided for wetland impacts typically vary depending on the location of the impact, inside or outside of the Coastal Overlay Zone. In the project area, the eastern boundary of the Coastal Overlay Zone is defined by the eastern edge of the existing El Camino Real right-of-way. For this project, however, the City has determined that all impacts to wetlands will be mitigated as if they all occur within the Coastal Overlay Zone.

The City of San Diego Land Development Code provides the following guidelines pertaining to impacts in the Coastal Overlay Zone and mitigation for wetland impacts:

- Within the Coastal Overlay Zone, impacts to wetlands, riparian scrub habitats in particular, must be avoided and permitted uses are limited to aquaculture, nature study projects or similar resource dependent uses, as well as wetland restoration projects and incidental public service projects (City of San Diego Land Development Code Section IIB2.).
- Permanent wetland impacts that are unavoidable and minimized to the extent possible must be mitigated through the creation of new, in-kind habitat to the fullest extent possible and at the appropriate ratios (City of San Diego Land Development Code Section IIIB1a.).
- If impacts to wetlands occur within the Coastal Overlay Zone, impacts must be minimized on-site, if feasible. If on-site mitigation is not feasible, then mitigation must occur in the same watershed.
- All mitigation for unavoidable wetland impacts within the Coastal Overlay Zone must occur within the Coastal Overlay Zone (City of San Diego Land Development Code Section IIIB1a).

Appropriate mitigation ratios for wetland impacts within the Coastal Overlay Zone are presented below in Table 5.

Table 5. City of San Diego Mitigation Ratios for Sensitive Vegetation Communities

Vegetation Types found in the Project Area	Habitat Types Defined by the City of San Diego	Mitigation Ratio
Disturbed Southern Coastal Salt Marsh	Coastal Wetlands	4:1
Disturbed Southern Willow Scrub, Disturbed Mulefat Scrub	Riparian Habitat in the Overlay Zone	3:1
Freshwater Marsh, Disturbed Freshwater Marsh	Freshwater Marsh in the Overlay Zone	4:1
Disturbed Diegan Coastal Sage Scrub	Sensitive Upland Tier II	1:1

Mitigation for impacts to wetland habitats resulting from the proposed Road Capacity and the Bicycle Safety alternatives would be accomplished on the JPA mitigation site. This will ensure that all mitigation provided for unavoidable wetland impacts within the Coastal Overlay Zone will be accomplished also within the Coastal Overlay Zone.

All impacts to wetlands resulting from bridge and road improvements would be mitigated at the ratios provided in Table 5. Specifically, for the road capacity and bicycle safety alternatives, impacts to disturbed southern willow scrub would be mitigated at a 3:1 ratio through creation and enhancement in the JPA mitigation area. Impacts to coastal freshwater marsh, disturbed coastal freshwater marsh, and disturbed southern coastal salt marsh would be mitigated at a 4:1 ratio through creation and enhancement in the JPA mitigation area.

A total of 7.7357 acres of wetland habitat mitigation will be required for both alternatives. The JPA mitigation site has approximately 20.4 acres available for mitigation. Thus, mitigation for both the road capacity and bicycle safety alternatives can easily be accommodated at the JPA mitigation site at the mitigation ratios presented in Table 5. However, there are isolated and degraded wetland habitats on the JPA site that would be converted to higher quality wetlands after the entire site is converted to wetland habitats. As stated previously, impacts to the existing wetland habitats on the JPA mitigation iste will be mitigated on-site at a1:1 ratio per agreement with the resource agencies. Thus, these impacts will not be mitigated at the City's ratios as presented in Table 5.

5.2.2 Mitigation for Indirect Impacts to Special-Status Species

Sections 4.3 and 4.4 of the NES provide detailed discussions of avoidance and minimization measures and compensatory mitigation that would be implemented to offset impacts to special-status plant and wildlife species affected by the central, western, eastern, and roundabout alternatives. These measures would be similarly implemented to avoid, minimize, and mitigate for direct and indirect impacts to special-status species resulting from the road capacity and bicycle safety alternatives.

Specifically, for the road capacity and bicycle safety alternatives, habitat based mitigation would be provided for indirect impacts to Clark's marsh wren, yellow warbler, and yellow-breasted chat. Habitat based mitigation would also be provided for indirect impacts to light-footed clapper rail and least Bell's vireo. The minimization and avoidance measures and the compensatory mitigation described in the NES for the western, central, eastern, and roundabout alternatives would also be provided for the road capacity and bicycle safety alternatives. See Section 4.3 of the NES for a detailed discussion.

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Chapter 6

Conformance with City of San Diego Multiple Species Conservation Program and Significance Determination

6.1 Multiple Species Conservation Program

Project conformance with the MSCP is discussed in Chapter 5 of the NES. In particular, Section 5.15 of the NES discusses the proposed project and introduces relevant portions of the MSCP subarea plan.

Section 5.14 of the NES provides a discussion of the MSCP as it applies to the proposed project. In particular, the NES addresses applicable land use considerations, land use adjacency guidelines, general management directives and the framework management plan.

The City of San Diego also requires that the proposed project conform to conditions of coverage for species present in the project area that are considered "covered" by the MSCP. Covered species are those that are considered adequately protected within the City of San Diego provided that they are conserved according to the conditions of coverage detailed in the City of San Diego subarea plan. Three covered species known to occur in the BSA (light-footed clapper rail, least Bell's vireo, and northern harrier) and their conditions of coverage are addressed in Section 5.14.1 of the NES.

6.1.1 Road Capacity and Bicycle Safety Alternatives

The road capacity and bicycle safety alternatives, like the other four alternatives analyzed for the Project, are located within the Northern area of the MHPA. Except for some differences in project features and project design, these two alternatives are similar to the central, western, eastern and roundabout alternatives in their compliance with the MHPA guidelines, land use considerations, and applicable land use adjacency guidelines. Three MSCP covered species are addressed in Section 5.14 of the NES. No additional MSCP-covered species were detected within the BSA for these two alternatives.

6.2 Significance Determination

Section 5.10 of the NES states that though the project has the potential to result in significant impacts to biological resources, these have been mitigated to a level below significant. Section 5.13 of the NES provides a discussion of the City of San Diego, ESL regulations relative to the proposed project. The following provides an additional analysis of project impact significance under CEQA. The project would result in significant impacts if it were to result in any of the following:.

1. A substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in the MSCP or other local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS).

Based on the implementation of avoidance and minimization measures described in Sections 4.3 and 4.4, the project will not have a substantive effect on special-status species. Project effects will be minimized by demarcating the locations of four special-status plant species to avoid unnecessary encroachment. In addition, construction monitoring will be provided to avoid incidental disturbance of these species. Potential impacts to seven special-status wildlife species will be avoided and minimized through the restriction of mitigation and all construction-related activities during nesting season, the creation of buffers around nesting areas, and the installation of exclusionary fence along the perimeter of the temporary work corridor within the river. Also, clearance surveys for light-footed clapper rail would be conducted daily during installation of the fence and during removal of vegetation within the river. For least Bell's vireo and light-footed clapper rail, no Project activities would be allowed during the breeding season for these species within any portion of the site where activities would result in noise levels exceeding 60 dB (decibels) L_{eq} (or the ambient noise levels if they already exceed 60 dB L_{eq}) at the edge of the occupied habitat.

2. A substantial adverse impact on any Tier I Habitats, Tier II Habitats, Tier IIIA Habitats, or Tier IIIB Habitats as identified in the Biology Guidelines of the Land Development manual or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS.

   Nine natural communities of special concern are present in the BSA and are described in Section 4.1 of the NES. Based on that discussion, no substantive effects on Tier I, II, III or IIIb habitats or defined sensitive natural communities are anticipated from the proposed project. Each of the six alternatives results in impacts to less than 1.0 acre of disturbed coastal sage scrub, a Tier II habitat. Mitigation for these impacts will be accomplished through purchase of credits from the City's Cornerstone Lands. This will ensure the preservation of high quality Tier II habitat to offset project impacts and will reduce impacts to a level below significant.

3. A substantial adverse impact on wetlands (including, but not limited to, marsh, vernal pool, riparian, etc.) through direct removal, filling, hydrological interruption, or other means.

   Based on the description of proposed project impacts and mitigation described in Section 4.2 of the NES and in Chapter 5 of this document, the project is not expected to have a substantive effect on federally protected wetlands. The City proposes to implement a wetland creation/enhancement plan at the JPA mitigation site. Creation and enhancement of wetlands will be accomplished at ratios between 3:1 and 4:1 in order to achieve a net gain of jurisdictional habitat and ensure no-net-loss of wetlands. Proposed mitigation is described in Section 4.2.4 of the NES.

4. Interfering substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, including linkages identified in the MSCP Plan, or impede the use of native wildlife nursery sites.

   Based on the implementation of avoidance and minimization measures described in Sections 4.4 and 5.12 of the NES and Chapter 5 of this document, the project is not expected to have a substantive effect on the movements of native resident or migratory fish species, migratory wildlife corridors, use of native wildlife nursery sites.

5. A conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan, either within the MSCP plan area or in the surrounding region.

   Based on Section 5.14 of the NES, the project is not expected to conflict with the provisions of the City's MSCP or other approved local, regional or state habitat conservation plan.

6. Introducing land use within an area adjacent to the MHPA that would result in adverse edge effects.

   The proposed project involves a road and bridge widening for an existing facility that is currently situated adjacent to the MHPA. Section 5.15 of the NES addresses wetland buffers and project compliance with MSCP guidelines. These guidelines include provisions that ensure that new land uses would not result in edge effects on biological resources.

7. A conflict with any local policies or ordinances protecting biological resources.

   Sections 5.13 through 5.14 address local ordinances or policies that apply to the biological resources occurring within the proposed project area. The project complies with the applicable policies or regulations.

8. An introduction of invasive species of plants into a natural open space area.

   Section 5.14 addresses project compliance with the MSCP Land Use Adjacency Guidelines. These guidelines require the use of native plants in order to avoid the introduction of non-native species into natural open space areas.

Based on this evaluation, anticipated project impacts on biological resources from any of the six alternatives would be considered not significant, or significant but mitigable in accordance with CEQA.

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Chapter 7
References

City of San Diego. 1995. North City Future Urbanizing Area Framework Plan. February.

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Appendix I
Construction Methodology Memorandum

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El Camino Real Road/Bridge Widening

Bridge Construction Methodology & Associated Noise Reduction Measures, and Biological & Hydraulic Impacts

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PROJECT BACKGROUND

The City of San Diego (City) proposes to modify the segment of El Camino Real between Via de la Valle and San Dieguito Road in order to improve the structural integrity of the vehicular bridge over the San Dieguito River, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, relieve traffic congestion, and improve consistency with the adopted land use plan for the project area.

The project area is in the northwestern part of the City of San Diego. The City of Del Mar is to the west, the Fairbanks Ranch Country Club development within the City of San Diego is to the east, and County of San Diego lands are to the north. The road being modified is El Camino Real from Via de la Valle on the north to San Dieguito Road on the south. This portion of El Camino Real, classified as a 2-lane collector, is approximately 2,400 feet long, 23 feet wide, has one travel lane in each direction, and has no shoulders, bike lanes, or pedestrian walkways. The road segment includes a bridge over the San Dieguito River that is 340 feet long and 27 feet wide. The San Dieguito River crosses under El Camino Real approximately 1,500 feet south of Via de la Valle.

In this location, El Camino Real would be inundated during a 100-year flood at several low points north of the river. Although the bridge surface would not be inundated, the 100-year flood level would rise to the bottom of the bridge deck, so there is not adequate room to allow debris to pass under the bridge. Also, the bridge is not structurally adequate for the local seismic conditions, because the piles are relatively shallow and buried in sediments that could fail in an earthquake due to liquefaction. In addition, this segment of El Camino Real is subject to severe congestion during peak travel times. The segment of El Camino Real included in the project currently operates at Level of Service (LOS) F at peak hours, reflecting congested traffic conditions. The proposed improvements include raising and widening El Camino Real roadway and replacing the bridge with a structure that is higher, wider, and has deeper piles.

Modifications to Via de la Valle from El Camino Real on the west to El Camino Real North on the east are also part of this project. This segment of Via de la Valle also operates at Level of Service (LOS) F. Most of this segment would need to be widened for appropriate transitions from widened El Camino Real.

Multiple build alternatives have been studied for this project, but for the purpose of this report, the focus will be on the Eastern Alignment Alternative.

EASTERN ALIGNMENT

Full widened roadway cross section with an alignment shifted east to allow independent construction of the new bridge, minimize impacts to developed properties along the western side of El Camino Real (Horsepark and Mary's Tack and Feed), and reduce impacts to wetlands in the drainage ditch parallel to the eastern edge of El Camino Real. The alignment for this alternative would be shifted eastward to where the toe of the new road's western embankment would tie in along the existing Polo Club fence. For this alternative, the roadway would be raised above the 100-year flood level on embankment.

PURPOSE

The purpose of this report is to discuss the following:

- Construction methodologies of the proposed bridge;
- Noise Reduction Measures during construction;
- Biological Impacts due to bridge construction; and
- Hydraulic Impacts during construction.

CONSTRUCTION METHODOLOGY

Temporary Berm Option

Overview

The option for utilizing a berm for construction the El Camino Real Bridge replacement is for a

Contractor to build a temporary berm that would provide a working pad area approximately 30 feet east of the new east edge of deck to approximately 30 feet west of the new west edge of deck of the bridge. The total width of the berm would vary based on the height of the fill placed. It would extend from the north bank to the south bank of the San Dieguito River, with openings (culverts or bridge crossings) for low flow channels as required for hydraulics. Using the berm and the embankment, the Contractor will construct the pile, columns, place temporary falsework, and for the construction of the superstructure of the bridge. Upon completion of the bridge, the Contractor will deconstruct the falsework, and remove the berm material from the river.

Once the bridge construction is done, the berm material will remobilize the same materials to the west side of the new bridge to construct a berm to be used for the demolition of the existing structure. This berm will also need to provide a 30’ working pad on each side of the existing bridge. This document is intended to provide an explanation of construction, and impacts, of the steps required to:

- Construct and deconstruct a berm
- Construct and deconstruct falsework
- (Includes skeletal description of building columns and the bridge superstructure)
- Demolish the existing bridge

Constructing the berm

- Contractor will mobilize heavy equipment to include a large dump trucks, bulldozers, front-end loaders, and excavators. It is expected that multiple quantities of each piece of equipment will be used.
- Contractor will mobilize substantial amounts of dirt, and large 1-2 ton angular rock near berm location with large dump trucks. Depending on the source and availability of material, the Contractor may be able to run a continuous import operation without a temporary staging area near the berm location.

- Prior to the operation beginning, the Contractor will identify the area within the River that will be impacted by the berm and place an impermeable barrier along the perimeter to avoid an increase in turbidity while the berm is being constructed. This barrier may be in the form of floating tubes with plastic sheeting hanging down and weighted at the bottom to prevent significant tidal water from passing through the impacted area.
- Contractor will utilize a bull dozer to grade the area along embankment where the berm will be located.
- Contractor will place geotextile, plastic sheeting or other impermeable material along the footprint of the berm starting at the embankment, above the high water mark, and working outwards into the river, perpendicular to the shoreline.
- The Contractor will start placing the dirt at the shoreline on top of the impermeable material and work outwards into the river. Along the perimeter of the berm the Contractor will place 1-2 ton rock as a protective barrier for the soil material.
- An operation using a dump truck, dozer and excavator will move the soil and 1-2 ton rock outwards from the shoreline onto the impermeable material.
- As the berm is constructed, the excavator will move out onto berm. The dozer or front-end loader will move material onto the constructed berm to allow the excavator to pick and place material.
- The impermeable material will be incrementally placed ahead of soil and rock-placing operation.
- The Contractor will establish openings in the berm as required to allow the river to flow. Openings may be constructed of multiple corrugated metal pipes (CMP) placed perpendicular to the alignment of the berm. Annular space between CMPs will be filled with dirt and plates will likely be placed over the CMPs. An alternative is for the Contractor to build a small bridge made of steel stringers and steel plates or timber decking material to span the opening(s).
- The width of the berm may vary to accommodate locations where outriggers for Contractor's cranes or concrete pumps may be placed.

Notes:

- The Contractor can complete construction of each abutment for the permanent structure concurrently while constructing the temporary berm.
- Upon completion of the temporary berm, the Contractor can begin construction of the Cast-In-Drilled Hole (CIDH) piles, the columns for the permanent structure, and the temporary falsework for the bridge.

Constructing large CIDH piles for columns

- Upon completion of the berm, the CIDH piles can be placed. Note: With the allowance of the placement of a significant amount of fill material in the River, the Contractor should not need to create cofferdams in order to construct the CIDH piles for the columns. Other options may be available to the Contractor with the placement of the large temporary berm, such as enlarging the berm around the pile locations or placing a large diameter casing at each column location, essentially creating a temporary cofferdam.

- Piles will be constructed using a large drill rig, large crane, front-end loader, Baker tanks for drilling fluid storage, dump trucks for spoil removal, and other typical construction equipment. It is expected that 3 WMBD Alt 2C – Large Berms the drilling will be done under drilling fluid, or slurry, or with the use of a full length temporary casing, based on the water level expected at the side.
- It is expected that a steel casing will be used to stabilize the top of the drilled shaft at each location, and although typically called a temporary casing, it is typically left in place. This casing could be as deep as 30' depending on the soil parameters found.
- Concurrently with constructing the berm, ironworkers will be building the steel cage for the CIDH piles and columns. Depending on availability of space, the pile and column cages may be built on the berm. If space is not available, the cages will be constructed in the Contractor's staging area near the embankment. In either scenario, reinforcing steel will be mobilized to the site by means of semi-trailers and off-loaded with the use of a large crane.
- The Contractor will construct the CIDH pile foundation by drilling through the berm, placing a casing and/or drilling slurry to maintain the hole, placing the pre-fabricated steel cage into the hole and pumping the required concrete mix into the drilled shaft while holding the steel cage and casing in place with other large cranes. As the level of the concrete rises, the casing used to maintain the drilled hole will be raised simultaneously to avoid excessive head pressure.
- This operation will be repeated to construct the required number of columns.
- Upon completion of each pile, the Contractor can begin construction on the columns for the bridge.

Constructing temporary falsework from the berm

Note: There is a possibility that no piles would be needed if the berm was stabilized during construction and can support the load from the falsework on spread footings. This would be up to the contractor during their falsework design process. This could possibly eliminate the need for any driven piles. For the purposes of this study it will be assumed that the Contractor cannot stabilize the foundation for the falsework and that piles are required. Falsework on a spread footing foundation is a best case scenario and falsework on piles is worst case.

- At the face of each abutment the Contractor will place a short falsework bent, likely constructed of wooden corbels, a 12X12 sill beam and 12X12 posts, and a 12X12 cap beam.
- Starting on the north end of the structure the Contractor will drive temporary steel piles through the berm to create a foundation for a falsework bent. Falsework piles will likely

be 20” diameter steel shell piles. This will be accomplished by staging the pile driving rig on the berm or on the embankment near the abutment. (Subsequent piles will be driven with the pile rig on the berm.)

- A steel pile cap will be placed on top of the driven piles, by use of a crane, and secured by welding or other mechanical connection.
- Steel or wooden falsework posts will be placed on top of the steel pile cap, by use of a crane, and secured by welding or other mechanical connection.
- A steel cap beam will be placed on top of the falsework posts, by use of a crane, and secured by welding and/or mechanical connection. **This completes one falsework bent.**

Note: The use of one large berm creates a working platform for constructing falsework and allows for ease of access for laborers.

- Alternatively, the Contractor may elect to pre-fabricate the falsework bents in the staging yard, mobilize them on site with semi-trailers and put them in place by use of a crane staged on the berm.

Because stability of falsework bents is critical, it is likely that once the Contractor completes two adjacent falsework bents the Contractor will place multiple steel stringers across the span, connect them to each bent and create a frame.

- This same sequence is repeated until all falsework bents and stringers are constructed. Access to the connection of stringer and cap beam can be obtained from the berm by use of a basket or cherry picker.
- There are a number of concurrent operations that can occur while the falsework bents are being constructed and stringers are placed. The ability of a Contractor to work concurrent operations is dependent on the availability of equipment, labor and materials.
- Once steel stringers are placed the Contractor will build a platform of 4x4 timbers and plywood on top of the stringers. The soffit of the bridge will be poured on this platform.
- Placement of stringers and remaining falsework items, and steel and concrete for the stem, soffit and deck construction will occur from the berm. This will require semi-trailers to access the embankment and deliver materials to the berm by either driving onto the berm or staging on the embankment and being off-loaded by a large crane.

The number of piles (if used) in a falsework bent and the number of falsework spans is to be determined by the Contractor. However an estimate of the typical spacing of piles is as follows: 1 falsework bent every 40’ max, with piles spaced at 5’ on center measured transversely to the bridge.

Constructing superstructure

- Once falsework is complete, construction of the superstructure of the bridge can commence.
- Delivery of forms, reinforcement steel and concrete will be from the berm and from the abutment locations.

- Concrete pumps will be staged at the abutments and on the berm. Concrete trucks will deliver concrete to the pump on the berm by accessing the berm.

Deconstructing the falsework

- Upon completion of bridge construction the Contractor will deconstruct the falsework in an opposite manner in which it was constructed.
- The falsework design and construction will include jacks, wedges, and pulleys that allow the Contractor to separate the platform and steel stringers from the bottom of the soffit after the bridge is prestressed.

Note: The use of the berm creates a working platform for removing falsework and allows for ease of access for laborers and welders, as well as demobilization of materials.

- Combining access from on top of the newly constructed bridge and the berm, the Contractor will remove the 4x4 platform and stringers.
- Working on the berm the Contractor will deconstruct each falsework bent and move material to the embankment.
- Removal of the falsework piles (if used) will be constrained vertically due to the construction of the new bridge. Permit requirements may dictate a number of options, to include:
    1) The contractor may leave piles in place but cut the top of the piles to the low water elevation.
    2) The Contractor must cut off the top of the piles down to 2 feet below the original riverbed. This may require the Contractor to dewater and/or divert the river away from the area where the piles will be cut, dig around each pile to 2 feet below riverbed and cut piles.
    3) The Contractor must remove all piles full length. This will be challenging for Contractors and force them to mobilize special equipment under the structure, raise each pile a certain length and cut off the portion above water. This operation will likely be the most expensive and time consuming of the options listed.
- Once all falsework material is removed it will be placed in the staging area in preparation for the next phase of construction.

Demolishing the existing bridge

- The construction of a temporary berm allows for ease of demolition of the existing structure.
- The Contractor will mobilize crews onto the temporary berm on the side of the existing bridge in order to facilitate demolition and removal of the concrete deck, beams and pier walls. It is likely that the combined access from the berm and the deck of the existing structure will be utilized to remove the deck and beams.

- With the berm acting as a barrier and preventing demolished concrete, steel and debris from falling into the San Dieguito River, the Contractor can mobilize demolition equipment onto the berm, demolish each pier and collect the material on the berm.
- It is proposed that the contractor would remove existing pier walls 2 feet below the original riverbed, leaving footings and piles below in place. This will be the least impactful and more feasible scenario.
- Demolished concrete, steel and other material will be mobilized off site by accessing the berm.
- Contractor will reestablish the existing conditions at each pier location and demobilize from the site. Repairs to the protective rock mat may be needed where the pier walls were removed.

Deconstructing the berm

- Upon completion of bridge construction the Contractor will deconstruct the berm in an opposite manner in which it was constructed.
- An operation of a dump truck, dozer and excavator will demobilize the soil, 1-2 ton rock, and the CMPs (or bridge) from the end of the berm towards the shoreline.
- The excavator will remove the material and place it into the bed of large dump trucks.
- A succession of large trucks will travel along the constructed berm and move the material off-site. Multiple trucks will be required to maintain a continuous operation.
- As the impermeable material is exposed it will be lifted out of the water and rolled up onto the end of the berm.
- This operation will continue until the berm is deconstructed to the embankment.
- Upon demobilization of the berm, the Contractor will deconstruct the turbidity barrier.
- The Contractor will restore the embankment area in accordance with permit requirements.

Trestle Construction Option

General:

- Typical width 30’
- Side trestle needed at each pier location. Assume 3 bents at 25’ spacing, overall dimension = width of the structure x 50 ft.
- Extend trestle full length across San Dieguito River
- Temporary piles will be driven for trestles using impact and vibratory hammers.
- Temporary piles for trestles can be removed using a vibratory hammer.

Construction process:

- Grade slope for crane access at abutment, set abutment foundation for trestle.
- Drive piles at 35' away from abutment. It is assumed a combination of vibratory hammer and impact hammer will be used to drive the piles. Spacing of piles will be roughly 4' to 5'. Approximately 6 or 7 piles will be needed at each bent. Workers will be required to access the bent location by boat or other means in the riverbed to set up driving template, to cut piles to height, to set cap beam, set beams, etc.
- Set transverse cap beam on top of row of piles. Connect to piles.
- Set longitudinal beams from abutment to first bent. 9 or 10 W24x117 or similar sized beams will likely be used in each span. Place lateral bracing for beams.
- Place crane pads or timber decking on beams.
- Drive crane and pile driving hammer and leads to the first bent.
- Repeat #2 to #6 above all the way across the river.

At Piers:

- From trestle, drive 3 rows of piles 25 feet apart, at similar spacing transversely, to the opposite side of the bridge. Pile spacing will be controlled by CIDH pile equipment loads.
- Set cap beam on top of row of piles. Connect to piles.
- Set beams between bents. Place lateral bracing for beams.
- Place crane pads or timber decking on beams.
- Use this 50' wide area to access the pier for drilling CIDH piles, constructing columns, etc.

Bridge Falsework Construction:

Falsework will be used to construct the new bridge superstructure. See El Camino Real Berm Construction Description document for detailed description of the bridge falsework and bridge construction. When no berm is used, the falsework will need to be placed on driven piles.

Demolition of existing structure:

Demolition of the existing structure could be done using a berm or trestle. This document will discuss the use of a trestle. See El Camino Real Berm Construction Description document for description of the use of a berm to remove the existing structure.

Demolition of existing structure using a trestle:

- A temporary trestle will be required to provide access for demolition of existing bridge.
- Trestle for demolition would be as complex as trestle built to construct the bridge, however it won't need to be as wide.

- Use of a trestle for demolition will require a netting system (or equivalent) supported from the trestle and existing piers to prevent debris from dropping into the San Diego River during demolition.
- Upon completion of the demolition of the existing superstructure, an additional trestle will be required to provide access to drive sheet piles around existing piers to facilitate partial removal of the substructure below grade.

Other Considerations during construction:

- Temporary turbidity barrier will need to be installed around the trestle prior to the start of pile driving. At least one opening on each side should be provided at main flow area to allow main river flow easy flow up and down stream.
- Elevation of the bottom of the trestle should be set above a significant flood elevation, to prevent it from being impacted in case of flood. Hydraulic analysis will be necessary to determine this elevation.
- Falsework piles will be driven from the temporary trestle.
- Pile spacing and span lengths will be controlled by the largest load on the trestle, likely the CIDH pile drill and the crane used when setting the rebar cage for the CIDH piles.

Removal of trestle:

- Remove decking from beams.
- Remove beams with crane sitting on adjacent span.
- Remove cap beams. Access to trestle bents by boat or other means in the riverbed will be needed for workers to cut welds, rig crane, etc.
- Using vibratory hammer, remove piles with crane sitting on adjacent span.
- Remove turbidity barrier by boat or other means in the riverbed.

Other Considerations:

- Removal of the piles will create a swelling of soil around the pile as it is pulled out that could be on the order of 2’ to 4’ high, depending on the cohesion properties of the soil. There will be a hole at the pile location as well. Depending on the type of material, it could collapse and fill itself in, or remain open for a long period of time.
- Falsework piles will be needed for this option for certain. For the berm options, it will depend on the capacity of the material placed in the channel and the underlying material. It is possible that falsework piles will be needed for the berm options as well.
- Removal of the falsework piles is limited in the trestle option by the elevation of the trestle because the equipment must work from the trestle. In the berm options, the removal is still limited, but possibly less so if the berm elevation can be lower than the elevation of the trestle. This could be done during the berm removal to allow greater headroom for pile removal.

NOISE REDUCTION MEASURES

A combination of the following methods may be used to reduce noise levels associated with construction:

- Timing and duration of operations was adjusted so that the required average hourly noise levels could be met. Noisy operations were only done intermittently during any given hour.
- All backup alarms were disconnected on manlifts and large equipment, and spotters were used around this equipment for safety purposes.
- Noise dampening panels were used to block the sound from the sensitive habitat areas. Sometimes this was just a sheet of plywood. Other times during operations like the bridge demo, these panels were large (8'x16') and insulated with noise dampening insulation. Multiple panels were used during many operations. These were used around stationary equipment such as light plants, locations used for sawing, and were supported on a forklift and moved around for mobile operations such as the bridge demolition.
- Noise monitoring was done daily during the breeding season and nightly during potentially noisy operations to monitor the noise levels and mitigation measures were adjusted as necessary during the operations.
- Typically propped into place around the equipment, leaned up against it. They put some up on the handrail around the bentcaps, and occasionally tied to the sides of the manlifts they were working from. The large ones were hung from a forklift.

PROPOSED METHODS TO AVOID AND MINIMIZE IMPACTS TO BIOLOGICAL RESOURCES

General

- Staging and equipment storage areas, and equipment maintenance will be located outside of the river corridor;
- A qualified biologist will train construction crews (including utility personnel) to avoid unnecessary impacts to the biological resources by briefing them on resource protection measures;
- Prior to the start of construction, a qualified project biologist will supervise installation of orange construction fencing or equivalent along the limits of disturbance within and surrounding sensitive habitats as shown on the approved construction plans. Temporary fencing will be removed after project completion.
- The project biologist will monitor all phases of construction to minimize impacts on sensitive species, check that wildlife is not entrapped, verify that the boundary fencing is maintained in good condition, and ensure that construction activities do not encroach into biologically sensitive areas beyond the approved limits of construction.

- A wildlife corridor will be maintained during all construction within the river corridor during non-breeding season. The wildlife corridor will consist of a spanned low flow channel of the river, approximately 40 feet wide. Orange construction fencing will be installed parallel to the low flow channel to discourage wildlife from accessing the construction areas approved in the plans.
- Construction lighting in upland areas will be the lowest illumination necessary, and directed away, or shielded from the river corridor
- The project site will be kept as clean of debris as possible to avoid attracting predators of sensitive wildlife. All food-related trash items will be enclosed in sealed containers and regularly removed from the site.
- Pets of project personnel will not be allowed on the project site.
- Disposal or temporary placement of excess fill, brush, or other debris will not be allowed in Waters of the U.S. or within their banks.

Light-footed Clapper Rail. Light-footed clapper rails have been documented both east and west of the existing ECR bridge. In order to avoid impacts to this species the following measures are proposed:

- No construction will occur within the river corridor during the clapper rail breeding season (February 15 – September 15);
- Noise from construction activities outside of the river corridor will not exceed 60dBA (1-hour) at the river corridor (or ambient, whichever is greater) during the light-footed clapper rail breeding season. If the noise limit is exceeded, the noise will be reduced by using temporary noise measures such as plywood barriers, equipment mufflers, or sound blankets;
- Outside of the breeding season, construction in the river corridor will be limited to daylight hours. No temporary lighting will be installed for construction at night;
- Prior to beginning construction at the end of the clapper rail breeding season (September 15) all vegetation within the approved limits of disturbance will be removed to eliminate the potential for rails to seek vegetative cover. The project biologist will monitor vegetation removal activities to avoid impacts to rails during this process. Should any rails be detected in the limits of disturbance, vegetation removal activities will be halted temporarily while the project biologists flushes the rail(s) from the area to be cleared into existing emergent vegetation west of east of the bridge;
- A wildlife corridor will be maintained during all construction within the river corridor during non-breeding season to allow east/west movement by rails. The wildlife corridor will consist of a spanned low flow channel of the river, approximately 40 feet wide. Orange construction fencing will be installed parallel to the low flow channel to discourage clapper rails from accessing the construction areas approved in the plans.

Least Bell's Vireo. Least Bell's vireo have been documented approximately 100- 300 feet west of the CER bridge. Measures to minimize impacts to this species include:

- No construction will occur within the river corridor during the combined breeding seasons of the light-footed clapper rail and least Bell's vireo (February 15 – September 15);
- Noise from construction activities outside of the river corridor will not exceed 60dBA (1 hour) at the river corridor (or ambient, whichever is greater) during the combined breeding seasons of the light-footed clapper rail and least Bell's vireo If the noise limit is exceeded, the noise will be reduced by using temporary noise measures such as plywood barriers, equipment mufflers, or sound blankets;

HYDRAULIC IMPACTS DURING CONSTRUCTION

Rick Engineering Company has prepared a preliminary assessment of the hydraulic impacts of the proposed temporary construction options anticipated for the El Camino Real Bridge. This section is intended to summarize the temporary hydraulic conditions that should be considered for potential construction methods.

As described previously, the construction methods specific to the bridge include the use of a Berm and/or Trestle in order to provide the required construction access and platform for equipment during construction. These access areas are already considered within the project boundary and in addition to the structural considerations of constructing the bridge; biological resources and hydraulic conditions within the river corridor are being considered. Therefore, an approach reflecting each of these potential issues is needed. Hydraulic issues should include specific return frequency storm events, daily flows, and tidal flow (if applicable). At this time, tidal flows are not being considered since the approximate limit of tidal influence is considered to occur at the downstream edge of the bridge.

Construction Phase

In order to provide required access for construction equipment, the berm or trestle option will need to elevate the berm/trestle to an elevation that is above daily flows within the river, however, low enough that it limits potential increases in water surface elevations for larger storm events (i.e. – 100-year storm event). The main channel of the river corridor contains approximately the 10-year storm event; however, nearly the entire 100-year storm event is conveyed under the existing bridge along the main channel corridor. During previous site visits, daily flows have been observed to occur at in the lower foot of the channel (plus or minus). Therefore, an opening in the berm would be needed, either in the form of culverts or a low flow channel opening that is sized to convey these daily flows, plus up to a preferred storm event (i.e. 2-year storm event or 1-inch storm event, etc). It is important to note that providing an opening to convey the 10-year storm event would not be practical since the main channel capacity is already limited to the 10-year storm event. Given the biological resources which include the presence of clapper rail and other species, a natural low flow opening may be preferable to allow a wildlife corridor during construction. Based on input from the structural engineer, it sounds like a 30 to 40-foot span could be provided over such a low-flow opening, which may equate to approximately a 20-foot bottom width. If additional low-flow capacity is needed, culverts could also be added to extend through the berm.

For typical construction activities, equipment can be removed at the end of each work day outside the limits of the main channel. However, for the large platform and crane that will be needed, it is not practical to remove at the end of each work day; therefore, this would be removed only with a predicted chance of precipitation greater than a specified amount (i.e. – a 50% chance of precipitation for 0.5 inches of rain or greater). For example, if the low-flow system has capacity to convey anticipated runoff from a 1-inch storm event, then the equipment would be removed if there is a 50% chance of precipitation expected to exceed 0.5-inches (providing a factor of safety).

In summary, key hydraulic considerations include:

- Elevation of temporary berm or trestle
- Low-flow opening(s) sized for daily flows and up to a specific storm event (i.e. – 1-inch storm or 2-year storm event)
- Minimize increase to water surface elevations for larger storm events (i.e. – 10-year, 50-year, 100-year).
- Removal of equipment from the channel with the prediction of storm events larger than those capable of bypassing through the low flow opening(s), including a factor of safety.

Modeling and Analysis

Once a preferred approach is selected, modeling can be provided to assess required elevations for the berm/trestle, capacity of low-flow openings, impacts to water surface elevations, and storm events that can be passed through the temporary configuration within the bridge corridor.

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Appendix J
Noise Modeling Memorandum

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Michael Baker INTERNATIONAL

We Make a Difference

MEMORANDUM

To: Alan Ashimine JN: 130642

From: Achilles Malisos

Date: March 11, 2015

Subject: El Camino Real Construction Noise

Unmitigated Construction Noise for Non-Pile Driving Activities

Construction noise associated with the El Camino Real Road/Bridge Widening Project was modeled with the Federal Highway Administration *Roadway Construction Noise Model* (*FHWA-HEP-05-054).* Stationary or mobile powered on-site construction equipment would include trucks, tractors, signal boards, excavators, backhoes, pile drivers, concrete saws, crushing and/or processing equipment, graders, scrapers, trenchers, pavers, and other paving equipment. Table 1, *Unmitigated Construction Noise Levels (Non-Pile Driving Activities)*, depicts the unmitigated noise levels at various distances during each construction phase.

Table 1
Unmitigated Construction Noise Levels (Non-Pile Driving Activities)

Distance From Source (feet)	Construction Noise Levels (dBA L_{eq})			
	Approaches (No Pile Drivers)	Approaches and Bridge (No Pile Drivers)		
	Grading	Demolition	Building	Paving
50	86.2	87.3	87.1	83.2
200	74.2	75.3	75.1	71.2
400	68.1	69.2	69.0	65.1
800	62.1	63.2	63.0	**59.1**
1,000	60.2	61.3	61.1	57.2
1,100	**59.4**	60.5	60.3	56.4
1,200	58.6	**59.7**	**59.5**	55.6
2,000	54.2	55.3	55.1	51.2
2,500	52.2	53.3	53.1	49.2
4,000	48.1	49.2	49.0	45.1
4,100	47.9	49.0	48.8	44.9

Note: Bold noise levels indicate the closest to the 60 dBA noise contour.

Source: Derived from the Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, dated January 2006. Refer to Attachment A, *Construction Noise Data*.

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Mitigated Construction Noise for Non-Pile Driving Activities

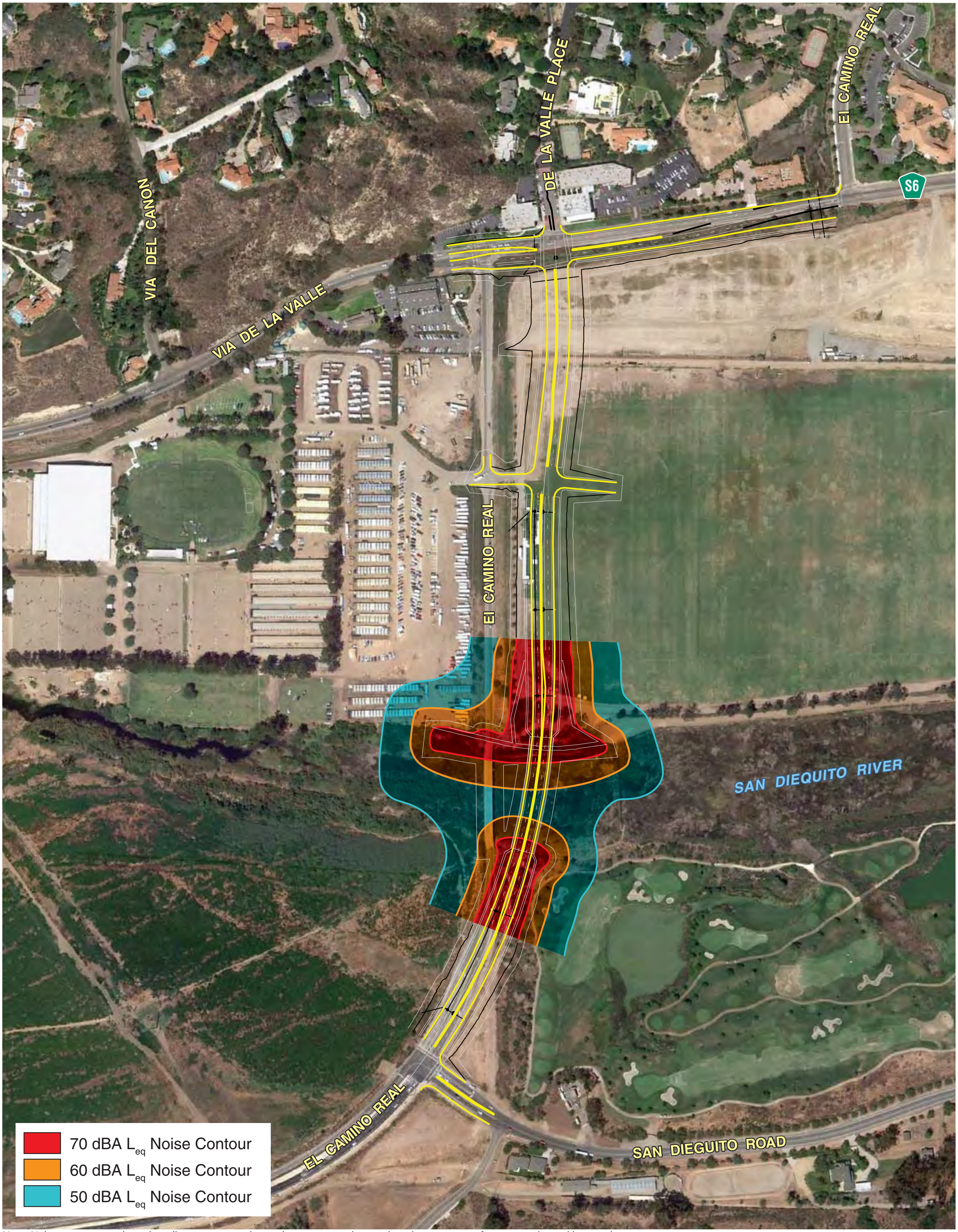
Noise source control is the most effective method of controlling construction noise. Source controls that limit noise, such as temporary barriers, are the easiest to oversee on a construction project. To be effective a noise enclosure/barrier must physically fit in the available space, must completely break the line-of-sight between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source, and extend length-wise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around the barrier. In these cases, the enclosure/barrier system must either be very tall or have some form of roofed enclosure to break the line-of-sight between source and receptor. Table 2, *Mitigated Construction Noise Levels (Non-Pile Driving Activities)*, depicts the mitigated noise levels (implementation of a temporary barrier) at various distances during each construction phase. The noise contours associated with the road construction with the temporary barriers are depicted in Exhibit 1, *Mitigated Road Construction Noise Contours*.

Table 2
Mitigated Construction Noise Levels (Non-Pile Driving Activities)

Distance From Source (feet)	Mitigated Construction Noise Levels (dBA L_{eq})[1]			
	Approaches (No Pile Drivers)[2]	Approaches and Bridge (No Pile Drivers)[2]		
	Grading	Demolition	Building	Paving
50	**59.2**	60.3	60.1	**56.2**
60	57.6	**58.7**	**58.5**	54.6
70	56.3	57.4	57.2	53.3
75	55.7	56.8	56.6	52.7
100	53.2	54.3	54.1	50.2
125	51.2	52.3	52.1	48.2
150	49.7	50.8	50.6	46.7
200	47.2	48.3	48.1	44.2
400	41.1	42.2	42.0	38.1
800	35.1	36.2	36.0	32.1
1,200	31.6	32.7	32.5	28.6

Notes:
1. Bold noise levels indicate the closest to the 60 dBA noise contour.
2. Noise levels include the implementation of temporary construction noise barriers with a surface density of 4.84 pounds per square foot and achieve a Sound Transmission Class (STC) rating of 35 and an Outdoor-Indoor Transmissions Class (OITC) of 27.

Source: Derived from the Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, dated January 2006. Refer to Attachment A, *Construction Noise Data*.



Note: Noise contours are based on distance attenuation and are conservative, as they do not account for topography and intervening structures.

0 400'

EL CAMINO REAL CONSTRUCTION NOISE

Mitigated Road Construction Noise Contours

03/11/15 JN 130642-18917 MAS

Exhibit 1

Pile Driving Noise

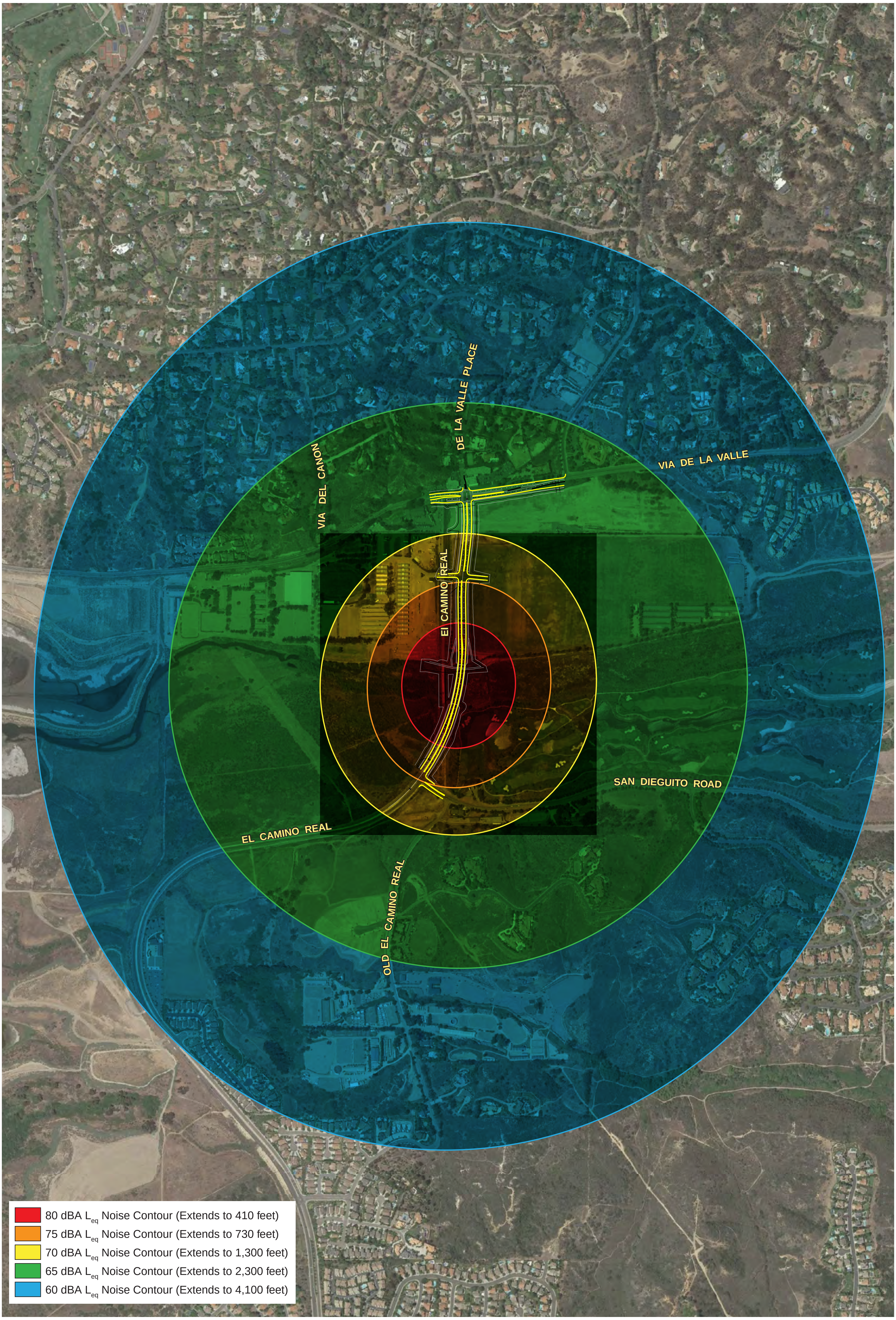
Pile driving would be required for construction of the bridge. Noise barriers would not be feasible for pile driving activities due to the size and height of pile driving equipment, the amount of piles to be driven, and the terrain where the noise barriers would be required to be located. Noise from construction with each type of pile driver is depicted in Table 3, *Construction Noise Levels with Pile Drivers*. Exhibit 2, *Bridge Construction Noise Contours (with Diesel Pile Driving)*, and Exhibit 3, *Bridge Construction Noise Contours (with Hydraulic Pile Driving)*, depict the noise contours associated with bridge construction using diesel pile driving and hydraulic pile driving, respectively. It should be noted that the noise contours are based on distance attenuation and are conservative, as they do not account for topography and intervening structures.

Table 3
Construction Noise Levels with Pile Drivers

Distance From Source (feet)	Construction Noise Levels (dBA L_{eq})		
	Bridge Construction (with Diesel Pile Drivers)	Bridge Construction (with Hydraulic Pile Drivers)	Vibratory Pile Removal
50	98.3	87.6	82.6
200	86.3	75.6	70.6
400	80.2	69.5	64.5
800	74.2	63.5	**58.5**
1,000	72.3	61.6	56.6
1,100	71.5	60.8	55.8
1,200	70.7	**60.0**	55.0
2,000	66.3	55.6	50.6
2,500	64.3	53.6	48.6
4,000	60.2	49.5	44.5
4,100	**60.0**	49.3	44.3

Note: Bold noise levels indicate the closest to the 60 dBA noise contour.
Source: Derived from the Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, dated January 2006. Refer to Attachment A, *Construction Noise Data*.

Hydraulic pile drivers can achieve a noise reduction of approximately 15 dBA when compared to diesel pile drivers. Additional noise abatement may also include the use of a noise shroud (a two-inch thick sound absorbing material backed by a vinyl tarp and hung from the leads of the pile driver). It should be noted that, in an effort to provide a conservative impact analysis, the noise reduction potentially achieved using a noise shroud is not reflected in Table 2 due to the lack of reliable data to quantify a noise reduction.

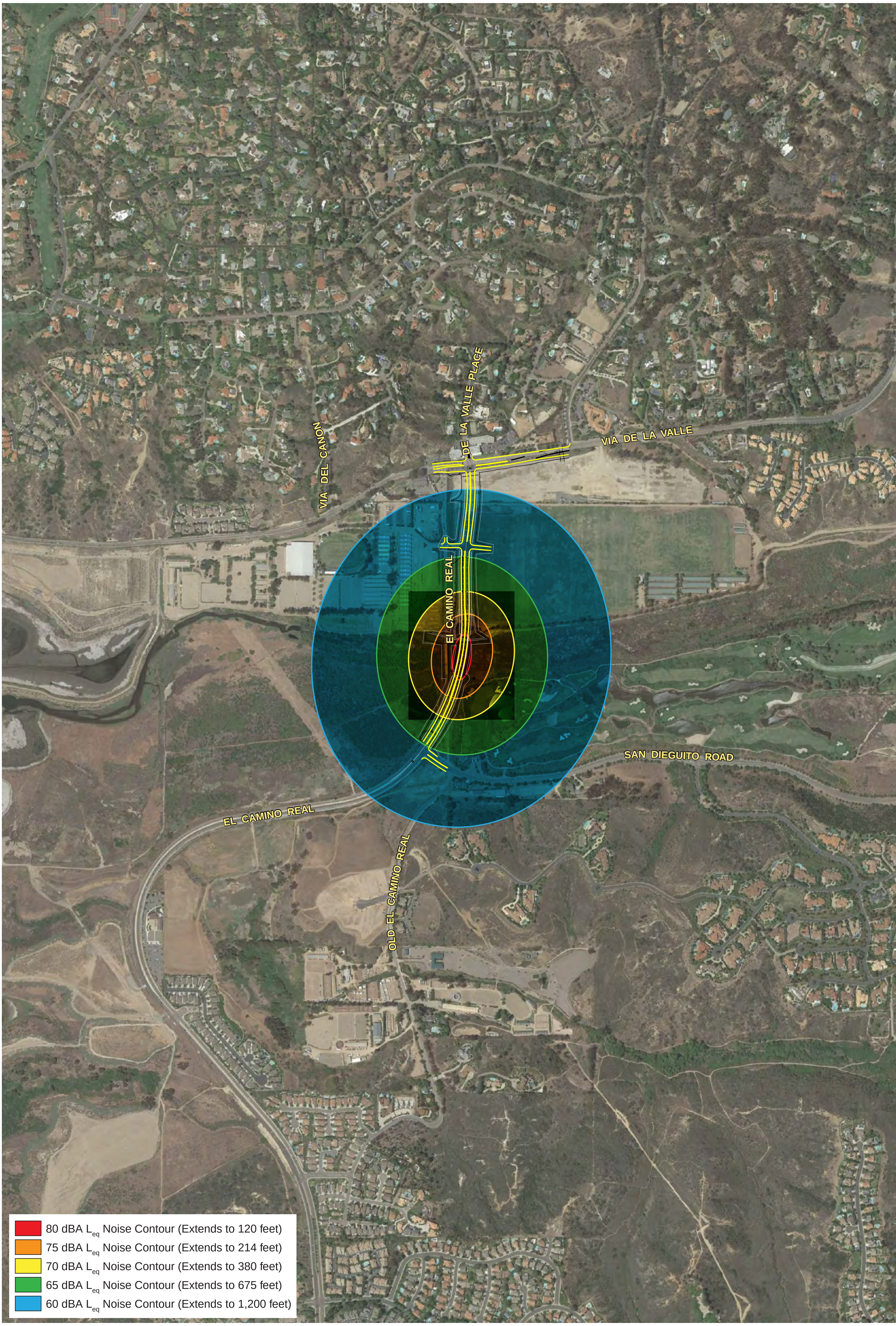


EL CAMINO REAL CONSTRUCTION NOISE

Bridge Construction Noise Contours (with Diesel Pile Driving)

03/11/15 JN 130642-18917 MAS

Exhibit 2



EL CAMINO REAL CONSTRUCTION NOISE

Bridge Construction Noise Contours (with Hydraulic Pile Driving)

03/11/15 JN 130642-18917 MAS

Exhibit 3

All pile removal activities would occur utilizing vibratory pile extraction. Vibratory pile drivers/extractors contain a system of counter-rotating eccentric weights, powered by hydraulic motors, and are designed in such a way that horizontal vibrations cancel out, while vertical vibrations are transmitted into the pile. The pile driving/extracting machine is lifted and positioned over the pile and is fastened to the pile by a clamp and/or bolts. Vibratory pile drivers/extractors can generally achieve a reduction of approximately 5 dBA when compared to hydraulic pile drivers. Estimated noise levels associated with vibratory pile removal are shown in Table 3, above, and these noise levels would not have the capacity to be louder than hydraulic pile driving activities associated with the project. Although pile extraction can be accommodated using a vibratory method, it has been determined that vibratory pile driving is infeasible based upon soil/geologic conditions at the project site.

As indicated in Table 3, the 60 dBA construction noise contour for the loudest phase (bridge construction with a diesel pile driver) would extend approximately 4,100 feet from the source. The 60 dBA construction noise contour for bridge grading with a hydraulic pile driver would extend approximately 1,200 feet from the source.

The demolition phase would be the loudest phase for construction activities that do not include pile driving. During demolition, the 60 dBA noise contour would extend approximately 60 feet from the source. To achieve this level of sound attenuation, the temporary barriers must conform to the following specifications:

- The noise barrier must completely break the line-of-sight between the noise source and the receptors.
- The frame of the barrier should be located around the entire perimeter of the construction area and consist of 3-inch by 3-inch by 0.065-inch thick steel tubing with welded joints. Alternatively, the frame can be constructed from lumber, but must be of sufficient strength to be structurally stable.
- Four layers of material attached to the frame with metal screws:
    - 18 ounce tarp;
    - 2-inch thick fiberglass blanket R-7.5;
    - ½-inch thick weatherwood asphalt sheathing; and
    - 7/16-inch sturdy board siding.
- Surface density of 4.84 pounds per square foot.

Attachment A
Construction Noise Data

Roadway Construction Noise Model (RCNM),Version 1.0

Report date: 11/20/2012
Case Description: ECR Grading - Bridge

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
50	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pile-Driver (Impact)	Yes	50	101		50	0
Excavator	No	40		80.7	50	0
Grader	No	40	85		50	0
Grader	No	40	85		50	0
Dozer	No	40		81.7	50	0
Backhoe	No	40		77.6	50	0
Front End Loader	No	40		79.1	50	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Pile-Driver (Impact)	101	98	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85	81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85	81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	101	98.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.0

Report date: 12/17/2012
Case Description: ECR Grading - Bridge

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
50	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pile-Driver (hydraulic)	Yes	50	85		50	0
Excavator	No	40		80.7	50	0
Grader	No	40	85		50	0
Grader	No	40	85		50	0
Dozer	No	40		81.7	50	0
Backhoe	No	40		77.6	50	0
Front End Loader	No	40		79.1	50	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Pile-Driver (hydraulic)	85	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85	81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85	81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85	87.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.0

Report date: 11/20/2012
Case Description: ECR Grading - Bridge

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
50	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	50	0
Grader	No	40	85		50	0
Grader	No	40	85		50	0
Dozer	No	40		81.7	50	0
Backhoe	No	40		77.6	50	0
Front End Loader	No	40		79.1	50	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85	81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85	81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85	86.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.0

Report date: 11/20/2012
Case Description Demo

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
50	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	50	0
Crane	No	16		80.6	50	0
All Other Equipment > 5 HP	No	50	85		50	0
Dozer	No	40		81.7	50	0
Tractor	No	40	84		50	0
Backhoe	No	40		77.6	50	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	89.6	82.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	80.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	85	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	89.6	87.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.0

Report date: 11/20/2012
Case Description: ECR - Building

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
50	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	50	0
Crane	No	16		80.6	50	0
Dump Truck	No	40		76.5	50	0
Excavator	No	40		80.7	50	0
Truck	No	50		0	50	0
Truck	No	50		0	50	0
All Other Equipment > 5 HP	No	50	85		50	0
Pumps	No	50		80.9	50	0
Dozer	No	40		81.7	50	0
Backhoe	No	40		77.6	50	0
Tractor	No	40	84		50	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck	78.8	74.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	80.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	76.5	72.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Truck	0	-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Truck	0	-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	85	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	80.9	77.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85	87.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.0

Report date: 11/20/2012
Case Description: Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
50	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	50	0
Concrete Mixer Truck	No	40		78.8	50	0
Paver	No	50		77.2	50	0
Roller	No	20		80	50	0
Tractor	No	40	84		50	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck		78.8	74.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck		78.8	74.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver		77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		80	73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	84	83.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Appendix K
Conceptual Mitigation Plan

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Conceptual Mitigation Plan for the El Camino Real Bridge/Road Widening Project

Prepared for

City of San Diego
Public Works - Engineering and Capital Projects
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April 20, 2015

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1.0 Introduction

This Conceptual Mitigation Plan (Plan) for the El Camino Real Bridge/Road Widening Project (Project) has been prepared for the City of San Diego (City) to serve as a planning tool for the primary purpose of conceptualizing an approach to meet typical performance standards for the types of habitats being restored. This document is conceptual in design. The objectives stated in this document have not been approved for implementation. A final restoration plan will be prepared, which will include elements of this Plan and be included in construction documents for the mitigation site. The City is currently coordinating with San Diego Association of Government (SANDAG) and the California Department of Transportation (Caltrans) to incorporate the mitigation area into a large-scale restoration effort.

1.1 Project Description

1.1.1 Project Location and Purpose

The El Camino Real Bridge/Road Widening Project is located in the City and in San Diego County, California. The site is located approximately 1.25 miles east of Interstate 5 (I-5; Figure 1). It is accessible from the east and west by Via de la Valle and from the south by Del Mar Heights Road. The road being modified is the segment of El Camino Real that runs from Via de la Valle in the north to San Dieguito Road in the south. The site is located on the U.S. Geological Survey (USGS) Del Mar Quadrangle, Sections 6 and 7, Township 14 South, and Range 3 West (Figure 2).

The 2,400-foot-long and 23-foot-wide segment of El Camino Real, currently classified as a two-lane collector, has one travel lane in each direction and has no shoulders, bicycle lanes, or pedestrian walkways. The road segment includes a bridge over the San Dieguito River crossing it approximately 0.3 mile south of the intersection of Via de la Valle and El Camino Real. The bridge is not high enough to allow 100-year flood levels to pass. The City proposes to modify this segment of El Camino Real and replace the bridge in order to improve the structural integrity of the bridge over the San Dieguito River, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, reduce traffic congestion, and improve consistency with the adopted land use plan. Via de la Valle from the intersection of existing El Camino Real eastward to El Camino Real North also would be widened to accommodate the proposed new configuration of El Camino Real.

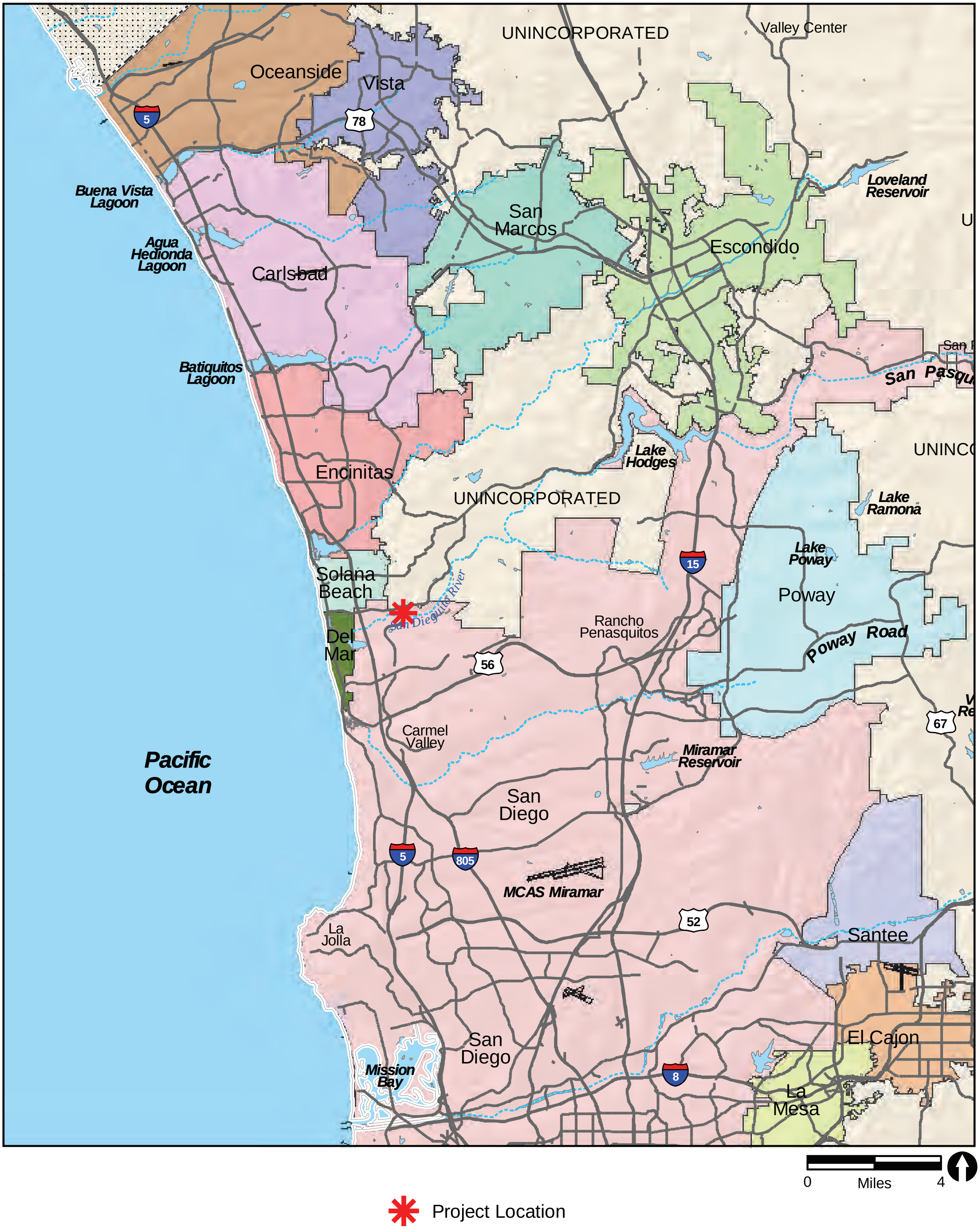

FIGURE 1

Regional Location

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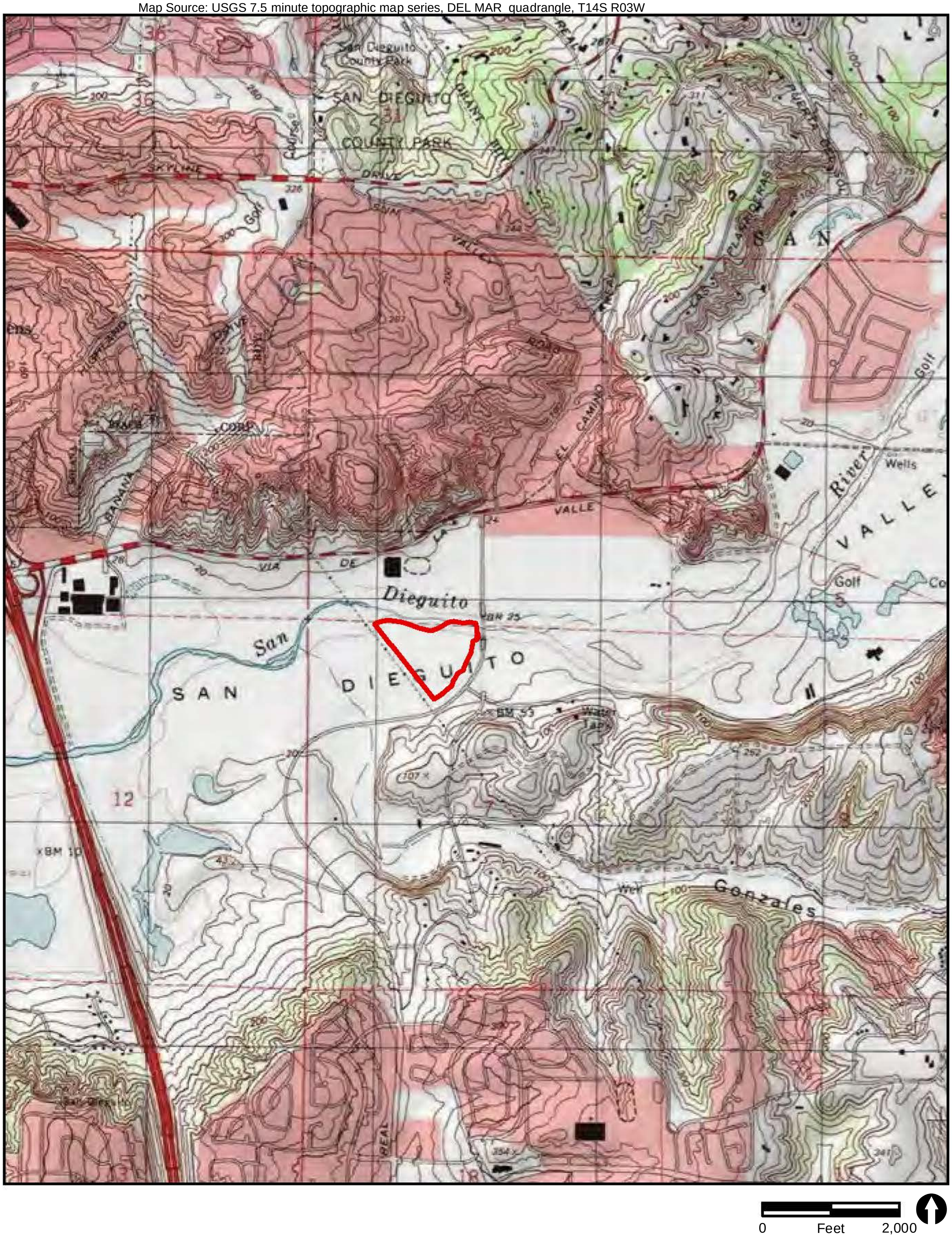
Map Source: USGS 7.5 minute topographic map series, DEL MAR quadrangle, T14S R03W



Project Boundary

FIGURE 2

Project Location on USGS Map

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The proposed El Camino Real Bridge/Road Widening Project is being analyzed in an Environmental Impact Report (EIR) to satisfy the California Environmental Quality Act for the City and in a separate Environmental Assessment (EA) for the Caltrans/Federal Highway Administration (FHWA) to satisfy the National Environmental Policy Act (NEPA). The Natural Environment Study (NES) for the El Camino Real Bridge/Road Widening Project identified the need for biological mitigation, and this document describes the conceptual plan for implementing the mitigation on sites adjacent to the project area. A final restoration plan is required to be prepared and approved. This mitigation will conform to several plans that pertain specifically to the management of the San Dieguito River Valley and which involve wetland restoration, creation, enhancement, and preservation. Mitigation is planned on a parcel owned by the San Dieguito River Park Joint Powers Authority (JPA) (off-site mitigation). If the Roundabout Alternative is selected, additional off-site mitigation areas will be required within a parcel owned by the City of San Diego, south of the JPA parcel and El Camino Real Road. The restoration of the off-site mitigation areas will provide habitat for many species that reside in the area. The coastal freshwater marsh area will provide habitat for the light-footed clapper rail (*Rallus longirostris levipes*). In addition, the riparian trees will ultimately provide foraging perches and nesting sites for raptors and quality stopover habitat for migratory songbirds. Other wildlife will benefit from the increased cover, vegetative productivity, and expanse of habitat.

1.1.2 General Setting

The affected portion of El Camino Real is situated within the northwestern part of the North City Future Urbanizing Area (NCFUA), a diverse planning area that extends from I-5 in the west to I-15 in the east, and from Los Peñasquitos Canyon in the south to Santa Fe Valley in the north. The NCFUA Framework Plan was initially adopted by the City Council in 1992 as an amendment to the General Plan in effect at that time. City zoning and the Framework Plan are the governing land use documents, although lands east of existing El Camino Real and north of Via de la Valle are outside the NCFUA. El Camino Real is identified on the 2008 General Plan Land Use and Street System Map (Land Use Element, Figure LU-2).

Existing land uses along El Camino Real between Via de la Valle and San Dieguito Road include commercial, agricultural, recreational, and open space. Land uses along the west side of El Camino Real, from north to south, are Mary's Tack and Feed (a commercial establishment), Del Mar Horsepark (Horsepark; an equestrian facility owned by the State of California 22nd District Agricultural Association), and undeveloped parcels owned by the JPA. Specific land uses along the east side of El Camino Real, from north to south, are undeveloped privately owned property; Polo Club fields owned by the City; and the expanded Fairbanks Ranch Country Club golf course, owned by the City. The commercial buildings along the north side of Via de la Valle are in the County of San Diego.

Most of El Camino Real within the study area is in the 100-year floodplain of the San Dieguito River, as are the lands east and west of the road in this location. The existing 100-year floodplain covers the majority of the valley floor including the Polo Club fields and portions of the Horsepark.

Elevation along the road alignment is approximately 6.1 meters (20 feet) above mean sea level (MSL), but drops to 1.5 to 3 meters (5 to 10 feet) from the existing roadbed to the adjacent habitat. Elevation at the San Dieguito River bottom is approximately 1.5 meters (5 feet) above MSL.

1.1.3 Alternatives Analyzed in Detail

Alternatives were considered for the El Camino Real Bridge/Road Widening Project, including Central Alignment Alternative, Road Capacity Alternative, Bicycle Safety Alternative, Western Alignment Alternative, Eastern Alignment Alternative, Roundabout Alternative, and Lower Elevation Alternative. It should be noted that two alternatives are not considered viable by Caltrans/FHWA because they do not provide all features needed to completely meet the purpose and need. These are the Road Capacity Alternative and the Bicycle Safety Alternative. The City would not be able to receive federal funds if either of these alternatives was chosen, and the two alternatives are not analyzed in the NES. Therefore, four alternatives were analyzed in the NES: Central Alignment Alternative, Western Alignment Alternative, Eastern Alignment Alternative, and Roundabout Alternative. In addition, the Lower Elevation Alternative is not analyzed separately in the NES, because it has the same configuration as the Central Alignment Alternative.

1.1.4 Wetland Mitigation Planning Context

Impacts to wetlands would occur for all build alternatives. Therefore, mitigation is required for the project impacts. Mitigation for all the build alternatives is proposed on an adjacent site owned by the JPA. This off-site mitigation accounts for approximately 20.4 acres of proposed wetland mitigation. As discussed in the NES, the Roundabout Alternative would require additional mitigation. Additional suitable mitigation opportunities exist within the project vicinity; therefore, additional off-site mitigation would be achieved on a site owned by the City of San Diego.

The off-site mitigation area owned by the JPA, formerly known as the Boudreau property, is located immediately south of the San Dieguito River, and is bounded to the east and south by El Camino Real (Figures 2 and 3). Surrounding land uses north of the El Camino Real Bridge/Road Widening Project include an equestrian center, commercial area, and recreational fields. A golf course is located to the east and open space to the south.

Image source: 2013 Microsoft Corporation

FIGURE 3

Project Area on Aerial Photograph

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The El Camino Real Bridge/Road Widening Project was designed to conform with the City Multiple Species Conservation Program (MSCP) as well as plans that pertain specifically to the management of the San Dieguito River Valley. These plans include the San Dieguito River Park Concept Plan (JPA 1994), San Dieguito River Valley Regional Open Space Park Master Plan (JPA 2000), Environmental Impact Report/Environmental

Impact Statement for the San Dieguito Wetland Restoration Project (USFWS and JPA 2000), and San Dieguito Wetlands Restoration Project Final Restoration Plan (Southern California Edition 2005). The El Camino Real Bridge/Road Widening Project conforms conceptually with the objectives of each of these plans in that each of these plans/projects involves wetland restoration, creation, enhancement, and preservation. In addition, the proposed alignment and widening of the road will not conflict with the construction of park trails, and there are no proposed projects that will impact the function of this site following implementation of restoration, creation, and enhancement activities.

The JPA property, located within the San Dieguito River Valley, has already been identified in the plans mentioned above as an area designated for future wetland restoration. The former Boudreau property was purchased in 2004 by the JPA with funds from the California Coastal Conservancy. A conceptual habitat restoration plan was developed for the parcel that was based on the non-tidal restoration plans developed by TES and Dudek & Associates and presented in the Park Master Plan (January 2000). Both the conceptual restoration plan for the Boudreau parcel and the non-tidal restoration plans developed for the Park Master Plan are relevant to the restoration plan developed for this project.

The off-site mitigation area owned by the JPA consists of former agricultural fields overtaken by non-native vegetation. Historically, this area has supported agricultural practices but has remained fallow for several years. The JPA, who owns the property on which the mitigation site is located, has also entered into an agreement with SANDAG to use the JPA parcel for mitigation and also to accommodate the JPA's mitigation requirements for the Del Mar segment of the coast to Crest Trail. Based on these ongoing efforts for mitigation, this conceptual mitigation plan will complement the large-scale restoration/mitigation planning efforts for the San Dieguito Lagoon.

The off-site mitigation area lies within a focused planning area of the San Dieguito River Park. It is also located directly east of the San Dieguito Wetland Restoration Project, which was developed within Landscape Unit A as identified in the San Dieguito River Park Concept Plan. The San Dieguito River flows from its eastern headwaters in the Volcan Mountains to the outlet at the San Dieguito Lagoon and Pacific Ocean at the community of Del Mar, San Diego County, California. The on-site mitigation area (construction footprint) is within the proposed El Camino Real Bridge/Road Widening Project footprint, which falls primarily west of the existing El Camino Real, north of San Dieguito Road and south of Via de la Valle. The road widening alignment extends across the floodplain of the San Dieguito River and is generally flat with the exception of the riverbed.

Wetland habitat mitigation for all of the alternatives except for the Roundabout Alternative can be attained within the 20.4-acre area available on the JPA Mitigation Site. As noted in the NES, the Roundabout Alternative would require additional mitigation. The Roundabout Alternative would be the only alternative requiring an additional 6.48 acres of wetland mitigation beyond the off-site mitigation area owned by the JPA. The City owns a parcel in Gonzales Canyon immediately south of the JPA site and south of El Camino Real that is considered suitable for mitigation, through a combination of creation and enhancement on up to 10.8 acres. A Memorandum of Understanding is in process should it become necessary to proceed with additional mitigation.

1.2 Responsible Parties

This Mitigation Program is being funded and implemented by the City. The JPA owns the property on which the mitigation site is located. The City is responsible for hiring a restoration biologist to oversee the mitigation implementation.

Permittee:

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Public Works – Engineering and Capital Projects
525 B Street, M.S. 908A
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Contact: Jayna Straughn

Preparer:

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San Diego, California 92101

1.3 Description of Impacts

The re-aligning and widening of El Camino Real and the new bridge will cause unavoidable impacts. As described in the EIR (City of San Diego 2015) and NES reports prepared for the El Camino Real Bridge/Road Widening Project (Tierra Environmental Services [TES] 2006 and ICF International [ICF]/Nordby Biological Consulting 2015), the project footprint involves several project features, including: 1) the bridge footprint, 2) the construction corridor in the San Dieguito River, 3) the road alignment, and 4) the construction corridor for the road alignment. The project footprint includes the construction areas, areas permanently covered by project features (e.g., the bridge), and staging corridors that will be disturbed only during road widening construction activities (construction easement). The staging area will be at the southern end of the project area, just northeast of the junction of El Camino Real and San Dieguito Road. Vegetation communities impacted by the El Camino Real Bridge/Road Widening Project include disturbed southern willow scrub, mule fat scrub, disturbed mule fat scrub, coastal freshwater marsh, tamarisk scrub, coastal freshwater marsh, disturbed coastal freshwater marsh, disturbed southern coastal salt marsh, alkali marsh, disturbed wetland, and disturbed Diegan coastal sage scrub. The coastal freshwater marsh within the San Dieguito River channel is especially sensitive, as it is considered habitat for the federal- and state-endangered and fully protected light-footed clapper rail. Additionally, certain alternatives will impact sensitive plant species including Palmer's sagewort (*Artemisia palmeri*), San Diego sunflower (*Bahiopsis lacinata*), San Diego marsh-elder (*Iva hayesiana*), and southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*). The City's 2002 guidelines call for mitigation ratios for wetland impacts ranging from 2:1 to 4:1; however, the 2002 guidelines allow that state and federal resource agencies may override City guidelines. Most impacts to wetland habitats, including both temporary and permanent impacts, will be mitigated through enhancement or creation of wetland habitats at ratios ranging from a minimum of 2:1 to 4:1 as dictated by City of San Diego mitigation guidelines (ICF/Nordby Biological Consulting 2015). As discussed in the NES for this project, in some cases, mitigation is proposed at ratios that are lower than the City's guidelines. Such accounting has been proposed for impacts associated with conversion of isolated and degraded wetlands located within the JPA's mitigation site to high-quality wetlands. All state and federal regulatory agencies involved with the mitigation plan have agreed that a 1:1 mitigation ratio at the JPA mitigation site is acceptable. Detailed discussion of proposed mitigation, including ratios that exceed City guidelines, is presented in Chapter 4 of the NES. In cases where the acreage for creation of a specific habitat exceeds the requirement, this is proposed in order to create a more complete restoration of the off-site mitigation area.

Disturbed Diegan coastal sage scrub occurs in small patches and narrow bands adjacent to developed areas along El Camino Real and San Dieguito Road. Mitigation of impacts to disturbed Diegan coastal sage scrub are planned at a 1:1 ratio as described in the NES prepared for the project. Impacts to this vegetation community will be mitigated through a contribution to the City's Habitat Acquisition Fund. However, as described in this plan, the City has an opportunity to create just over an acre of coastal sage scrub for the construction of the berm (see Section 3.2.3).

On-site and off-site mitigation for wetland habitats, especially light-footed clapper rail habitat, is the focus of this Conceptual Mitigation Plan. For a full breakdown and description of impacts and mitigation requirements for all alternative alignments, please refer to the 2015 NES prepared by ICF/Nordby Biological Consulting.

Permanent impacts will occur in areas permanently altered as a result of constructed project features. Mitigation for both permanent and temporary impacts will be accomplished at permanent impact ratios. On-site mitigation work to restore areas temporarily impacted by construction activities is planned immediately following the completion of construction on the El Camino Real Bridge/Road Widening Project. Off-site mitigation work at the JPA parcel is planned prior to the construction of the bridge and road widening. It is the City's intent to begin implementation of off-site mitigation prior to the construction of the bridge.

According to the NES prepared for the El Camino Real Bridge/Road Widening Project, mitigation for unavoidable impacts to sensitive wetland habitats would be accomplished by creating habitat of equal value and enhancing degraded wetland habitats, including creation/enhancement within the proposed off-site mitigation area. Given the potential mitigation opportunities on the JPA site, creation of freshwater marsh as mitigation for impacts to both existing disturbed and undisturbed coastal freshwater marsh and existing disturbed coastal salt marsh can be accomplished for the Western, Central, and Eastern Alignments while accommodating mitigation for impacts to other wetland habitats. However, impacts from the Roundabout Alternative would require additional mitigation. Should this alternative be identified as the preferred alternative, additional mitigation opportunities for marsh habitat are being negotiated by the City with SANDAG, because currently the mitigation plan within the JPA mitigation area does not include enough area to mitigate for all impacts to marsh habitats.

2.0 Proposed Mitigation Site

The primary feature of the proposed mitigation is the creation of coastal freshwater marsh as mitigation for impacts to existing freshwater marsh and existing disturbed coastal salt marsh. This habitat will be created to complement the freshwater marsh habitat in the San Dieguito River that is currently occupied by the federally listed endangered and state-listed endangered and fully protected species light-footed clapper rail that will be impacted during construction/demolition. As introduced in the NES Report (ICF/Nordby Biological Consulting 2015), mitigation is proposed at the JPA site.

2.1 Location and Size of Proposed Mitigation Site

The mitigation site proposed for the El Camino Real Bridge/Road Widening Project is west of El Camino Real and south of the San Dieguito River within the City of San Diego. Suitable areas for mitigation exist on approximately 20.4 acres located on a 66.8-acre property (Assessor's Parcel number [APN] 304-020-16) currently owned by the

JPA. The off-site mitigation area is adjacent to the project area, located in the San Dieguito watershed, and consists of recently abandoned agricultural fields. If additional mitigation acreage is required, as would be necessary if the Roundabout Alternative is selected, mitigation would be achieved on an available site immediately south of the JPA site and south of El Camino Real. The site available for additional mitigation is an approximately 11-acre area of the western portion of Lot A of Gonzalez Canyon immediately south of the JPA site and El Camino Real. This site is part of a 33-acre City-owned parcel (APN 304-020-26) and is designated as open space within the City's MHPA. The additional mitigation site, also located within the San Dieguito River Valley, is adjacent to a site approved for future wetland creation and enhancement areas for the St. John Garabed Church Project. Although not anticipated to be needed, as part of the research and investigation into wetland mitigation opportunities for this project, the City also identified an approximately 3-acre area on City-owned parcel southeast of San Dieguito Road and Fairbanks Ranch Country Club (APN 302-262-05) suitable for enhancement. The JPA off-site mitigation area and the additional mitigation area located south of the JPA parcel are described in more detail below.

2.2 Existing Conditions of Proposed Off-site Mitigation Area

The existing conditions of the majority of the off-site mitigation area include abandoned agricultural fields with a high density of non-native vegetation. The proposed mitigation site is bounded by the San Dieguito River to the north, El Camino Real to the south and east, and an elevated utility corridor (San Diego Gas & Electric [SDG&E] easement) that runs through the JPA property. As described in the EIR, the utility corridor includes above-ground electric lines, a buried high-pressure natural gas line, and buried fuel lines. Mitigation has been constrained to the portion of this parcel that lies to either the east or west of the utility corridor in order to avoid jeopardizing the buried utilities. The SDG&E easement will not be disturbed for mitigation activities. Because the resource agencies would like the mitigation site to be as close as possible to the El Camino Real bridge, the eastern portion of the property will be used to the maximum extent possible.

As described in the NES, the existing mule fat/southern willow scrub (riparian scrub) enhancement area, located south of the San Dieguito River and west of El Camino Real, is currently dominated by disturbed southern willow scrub which contains arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), narrowleaf willow (*Salix exigua*), and mule fat (*Baccharis salicifolia*). This habitat also contains a high concentration of tamarisk (*Tamarix ramosissima*), which characterizes it as disturbed. Patches of tamarisk scrub also occur within the riparian scrub enhancement area as well as small amounts of disturbed coastal brackish marsh, coastal freshwater marsh, and disturbed habitat.

The riparian scrub creation area is an abandoned agricultural field and is currently dominated by tamarisk scrub and disturbed Diegan coastal sage scrub/baccharis as described in the NES. This disturbed Diegan coastal sage scrub contains *Baccharis sarothroides* and *B. pilularis* as well as non-native species such as tree tobacco (*Nicotiana glauca*) and Russian thistle (*Salsola tragus*). Small patches of disturbed habitat, disturbed southern willow scrub, and non-native grassland also occur within the riparian scrub creation area. As described in the NES, the mitigation site's existing ground surface varies from approximately 11 to 12 feet National Geodetic Vertical Datum (NGVD). The water table in this area was reported to be within 6 feet of the ground surface in 2006 (Tierra Environmental Services 2006). Two geotechnical borings implemented in support of the project in July 2011 encountered ground water at approximately 7 and 9 feet. Therefore, lowering the elevation of this area by approximately four feet will allow the planted container stock access to groundwater.

The proposed area for coastal freshwater marsh creation is located immediately adjacent to the west side of the bridge, where similar soils are expected (Figure 4). The proposed area occurs upstream of the San Dieguito Lagoon, where there is no longer any tidal action (TES 2006; ICF/Nordby Biological Consulting 2015). As described in the NES, this area is currently dominated by disturbed Diegan coastal sage scrub/baccharis and contains areas of disturbed habitat as well as small patches of non-native grassland, alkali marsh, and disturbed wetland.

As described in the NES, the proposed area for the vegetated berm is currently dominated by Diegan coastal sage scrub/baccharis and contains disturbed habitat, tamarisk scrub, and a small patch of disturbed Diegan coastal sage scrub/coastal form.

Mitigation acreage available at the JPA property includes the opportunity to enhance and create riparian scrub and create coastal freshwater marsh habitat. The JPA property is appropriate for mitigation, because it is adjacent to the El Camino Real Bridge/Road Widening Project area and is suitable for creating habitat for the light-footed clapper rail. It also lies within the Coastal Zone that will allow mitigation for project impacts within the Coastal Zone. In addition, the value of restoring this parcel is amplified by its contiguity to the San Dieguito Lagoon Wetland Restoration Project located immediately downstream of this site.

Image source: 2012 SanGIS

Project Boundary

Clapper Rail Access

Turf Reinforcement

Mitigation Areas

Freshwater Marsh Creation

Coastal Sage Scrub Berm

Riparian Scrub Creation

Riparian Scrub Enhancement

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FIGURE 4

Mitigation Site

Additional mitigation acreage available, should the Roundabout Alternative be selected, is located within a City-owned parcel in Gonzales Canyon. This portion of Gonzalez Canyon is located immediately south of the JPA property and is also appropriate for mitigation based on its close proximity to the El Camino Real Bridge/Road Widening Project and JPA property (Figure 5). This parcel includes the opportunity for cismontane alkali marsh creation (approximately 3.1 acres) and freshwater marsh enhancement (approximately 2.9 acres), which are both adjacent to the proposed wetland creation and enhancement areas for the St. John Garabed Church Project (Dudek 2013). The potential cismontane alkali marsh creation area is currently dominated by disturbed habitat including non-native invasive plants such as Bermuda grass (*Cynodon dactylon*) and mustards (*Brassica* spp.) as observed during a site visit on December 8, 2014 and during surveys conducted for the St. John Garabed Church Project (Dudek 2013). The potential freshwater marsh enhancement area contains freshwater marsh habitat dominated by cattail (*Typha* sp.) and tule (*Schoenoplectus* sp.) with non-natives including tamarisk, castor bean (*Ricinus communis*), and pampas grass (*Cortaderia jubata*). If additional mitigation is required, there are opportunities for cismontane alkali marsh restoration and southern willow scrub enhancement at this site. If site constraints on the additional mitigation site reduce the area available for restoration from what is described above, there is potential for southern willow scrub enhancement within a City-owned parcel located east of San Dieguito Road and south of Camino Santa Fe (see Figure 5).

3.0 Mitigation Program Description

The mitigation program was developed in coordination with the City and the regulatory agencies. Mitigation ratios are based on sensitivity of the light-footed clapper rail, as recommended by the California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS) in multi-agency coordination meetings held in 2005 and included in Appendix C of the EIR (City of San Diego 2006). Mitigation for impacts to sensitive habitats and sensitive species has been proposed in accordance with the Environmentally Sensitive Land (ESL) regulations found in the City's Land Development Code.

3.1 Goal of the Mitigation Plan

RECON Environmental, Inc. (RECON), on behalf the City, has developed this Plan for the El Camino Real Bridge/Road Widening Project. The purpose of this Plan is to provide compensatory mitigation for the project's impacts to jurisdictional areas and for the City MSCP. The goal of this Plan is to mitigate for habitat-based impacts and to provide restored habitats for sensitive species, primarily including the light-footed clapper rail. Secondarily, habitat for associated sensitive plant communities, including

Image source: SanGIS (flown May 2012)

Potential Mitigation Areas

- Cismontane Alkali Marsh Creation
- Freshwater Marsh Enhancement
- Cismontane Alkali Marsh Restoration
- Southern Willow Scrub Enhancement

RECON

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FIGURE 5

Additional Mitigation Areas for Roundabout Alternative

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coastal freshwater marsh, southern willow scrub, and mule fat scrub will be created, restored, and enhanced with the intent of creating habitats that over time will be self-supporting. To achieve these goals, this mitigation program provides the guidelines for specific tasks, including site preparation, implementation, maintenance, and biological monitoring.

The Plan, once executed, will enhance, restore, and add breeding and foraging habitat for the light-footed clapper rail. The physical and biological characteristics of the mitigation site are unique in terms of supporting breeding light-footed clapper rails. Clapper rails have been known to utilize freshwater marshes for breeding and foraging, and this restoration effort seeks to significantly expand the distribution and territory for existing populations. This Plan seeks to provide the guidelines for creating a combination of shallow, slow-moving water and dense vegetation adjacent to open pools, which creates areas of freshwater marsh that will be ideal for the clapper rail. This shallow, slow-moving water provides conditions favorable to aquatic prey organisms and the establishment and persistence of emergent vegetation, both habitat requirements for the light-footed clapper rail. The dense emergent vegetation will provide cover for this secretive species, while the open pools will provide foraging habitat immediately adjacent to cover. These types of characteristics will be incorporated into the design of this Plan in order to benefit the primary species of concern throughout every aspect of the mitigation effort.

To meet the goals outlined by this Plan, an intensive restoration effort must be undertaken to create, restore, and enhance the target habitat types within the mitigation site. The focus of the effort will revolve around three primary elements of restoration: biological, chemical, and physical, as discussed in detail below. In addition, the types of habitat to be restored include two coastal ecosystems (coastal freshwater marsh and riparian scrub) and one upland area (Diegan coastal sage scrub).

3.1.1 Biological

Coastal ecosystems maintain a variety of microhabitats, which support diverse assemblages of biota over many levels of the food web. The various habitat types within the ecosystem provide habitat for the protection, breeding, and foraging of migratory birds, reptiles, fish, amphibians, and insects. The high primary productivity (plant and algal growth) also leads to large amounts of detritus, which feeds the detrital food web consisting of aquatic and benthic (living on the bottom of a body of water) insects and other organisms. The large detritivore community is available as prey for foraging birds. The shallow water within coastal ecosystems allows light penetration to support algal growth on emergent vegetation. Algae are an excellent food source for snails, shrimp, small fish, and other prey of higher food levels. It is anticipated that the restoration effort will provide significant increases in available native food sources within the system and lead to an increase in wildlife, including the light-footed clapper rail population.

Many species of wildlife are dependent on coastal ecosystems during some or all of their lifecycles. Coastal freshwater marshes and riparian scrub habitats within dry regions such as San Diego County are especially important, because many species that live in the adjacent shrub vegetation types seek refuge in the marsh and riparian vegetation during the dry season.

Coastal and riparian habitats are often preserved through the regulations imposed by federal and state agencies (i.e., Section 404 of the Clean Water Act; Section 1600 of the California Fish and Game Code, Streambed Alteration Agreement). Riparian habitat may facilitate wildlife movement from one area to another, while marsh systems with habitat connectivity maintain populations of migratory animals, provide corridors for gene flow, allow wildlife and plant dispersal to new areas, and provide movement corridors at both the local and regional level. Dispersal into connecting habitats increases the diversity of plants and animals that can be supported. This Project will increase the connection of habitats throughout the lower San Dieguito River by increasing the size and connectivity with downstream restoration areas and upstream riparian habitat.

Through implementation of this Plan, biological conditions will be restored that encourage the development of plants and lower animals that provide the basis of the food web. The plant growth, plant and insect species diversity, and the use of the restored habitat by animals are ways to measure whether this goal has been met. The monitoring program is discussed in Section 7.0 of this Plan.

3.1.2 Chemical

Primary biogeochemical marsh and riparian functions include nutrient cycling and the transformation or elimination of pollutants from water. Coastal ecosystems receive, store, and recycle nutrients that support primary productivity and the lower levels of the food chain. Soluble inorganic nutrients (i.e., nitrogen as nitrate and ammonia, and phosphorus as phosphate) present in the influent are taken up by attached algae and marsh vegetation for growth. The nutrients are subsequently stored as living material until death and decay. Then, the nutrients are held as detritus within the marsh substrate, decomposed to peat, or released as insoluble organic nitrogen and phosphorus. Bound in organic compounds, the nutrients are not immediately available to support algal growth that leads to poor water clarity and quality.

When coastal ecosystems are inundated with water and when soils are saturated, oxidized nitrogen and sulfur can be reduced in the anoxic soil and released in their respective gaseous forms. Generally, the coastal marsh ecosystems within the project area should be saturated year round, leading to high accumulation of organic nutrient compounds in their substrate and producing high levels of gaseous release, while riparian habitat, due to drying periods, are only seasonally saturated, leading to less accumulation of organic nutrient compounds in their substrates. During this time, toxic conditions induce organic matter to break down and nutrients to be recycled to inorganic forms.

In addition, vegetation growing in these soils hold nitrogen and phosphorus as well as other nutrients and toxins that are filtered out by vegetative uptake and water movement. Natural filtration and sedimentation that removes imported elements (i.e., macronutrients, heavy metals) and pollutants (i.e., oils, pesticides) from floodwaters, runoff, and precipitation provide a medium for chemical reactions. The removal of toxins and available nutrients greatly improves water quality.

Implementation of this Plan will set the physical and some of the biological parameters to allow the restoration of the chemical function and value of the coastal ecosystems.

3.1.3 Physical

Key physical functions of coastal ecosystems include reducing flood risk, sediment trapping, and ground water recharge. The gradual slope of coastal ecosystem terrain and proliferation of vegetation slows flowing water to promote silt deposition and sediment trapping. The reduction in particulate matter improves the water clarity and quality. The riparian zone between aquatic and terrestrial environments provides a catchment or buffer zone for downstream flood control, while the marsh ecosystems provide a dissipation buffer for flood waters and an area for groundwater recharge. The benefits of these physical processes include floodwater attenuation, erosion control, improved water quality, and improved groundwater uptake.

The physical functions within the riparian ecosystem will be restored by replacing the existing stands of invasive plant species with a broad diversity of herbs, shrubs, and trees that are native to the region, and the coastal ecosystems will be created by grading the area to meet marsh topography in areas that are currently under agricultural production.

3.2 Types of Habitat to be Created, Restored, and Preserved

Consistent with U.S. Army Corps of Engineers (USACE) guidance, the terms “creation,” “restoration,” and “enhancement” as used in this plan have the following meanings (USACE 2012):

- Creation: The development of the hydrologic, geochemical, and biological components necessary to support and maintain a wetland (marsh) where a wetland (marsh) did not previously exist. Creation results in a gain in wetland acres.

- Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former or degraded wetland (marsh).
- Enhancement: The alternation of an existing wetland (marsh) to increase its specific functions and values. Enhancement actions include new capabilities, management options, or other actions to influence one or several functions and values. Enhancement includes the removal of non-native vegetation and does not result in a gain of wetland (marsh) acres, but establishes their long-term conservation.

Habitat creation, restoration, and enhancement will focus on four vegetation communities, as described for the JPA site in detail below. Coastal freshwater marsh and riparian scrub restoration will focus on providing refuge and foraging habitat for the light-footed clapper rail, thereby increasing the habitat value for this species. All habitat types will provide benefits to this species as well as other wildlife in the provision of forage, cover, and unrestricted movement—aspects that are currently compromised by the dense cover of invasive plant species and residual effects of agricultural production.

3.2.1 Coastal Freshwater Marsh

Coastal freshwater marsh is a vegetation community dominated by perennial, emergent, herbaceous monocots up to five meters tall. Vegetation cover is often very dense, and these areas are flooded by fresh water (Holland 1986). Characteristic freshwater marsh species found dominating the project area include southern cattail (*Typha domingensis*), willow dock (*Rumex salicifolius*), saltgrass (*Distichlis spicata*), California bulrush (*Schoenoplectus californicus*), salt heliotrope (*Heliotropium curassavicum*), and southwestern spiny rush (*Juncus acutus*).

An area of approximately 15.4 acres will be graded to approximately the same elevation as the existing freshwater marsh to create habitat suitable for providing breeding habitat for light-footed clapper rails (see Figure 4).

3.2.2 Riparian Scrub

Riparian scrub being restored as part of the mitigation for the El Camino Real Bridge/Road Widening Project includes southern willow scrub and mule fat scrub. Both habitats are considered sensitive wetland habitat by CDFW and USACE.

Southern willow scrub is a dense riparian community dominated by broad-leafed, winter-deciduous trees such as willows (*Salix* spp.), and often scattered with Fremont cottonwoods (*Populus fremontii*) and sycamores (*Platanus racemosa*). The density of the willows typically prevents a dense understory of smaller plants from growing. The representative species typically grow in loose, sandy, or fine gravelly alluvium deposited near stream channels during flood flows. This community requires repeated flooding to prevent succession to a community dominated by sycamores and cottonwoods (Holland 1986).

Mule fat scrub is a tall, herbaceous riparian scrub strongly dominated by mule fat. This plant community is an early seral plant community that occurs along drainages with a coarse substrate and a moderate depth to the water table. Mule fat scrub is developed and maintained from flooding or other disturbance, but may change through successional processes to willow–cottonwood or sycamore-dominated riparian forest/woodland in the absence of disturbance (Holland 1986). The community can also occur where dominant riparian scrubs and woodlands are disturbed or open, and will integrate with the willow scrub currently growing along the riparian corridor of the San Dieguito River.

Southern willow scrub/mule fat scrub habitat will be created at the same elevation as the existing southern willow scrub/mule fat scrub habitat on-site. This will require the removal of approximately four feet in elevation of existing soil for a three-acre area. In addition, two acres of degraded riparian scrub habitat will be enhanced by the removal of invasive plant species such as salt cedar (*Tamarix* spp.) and iceplant (*Carpobrotus* spp.) (see Figure 4).

3.2.3 Diegan Coastal Sage Scrub

Diegan coastal sage scrub is a vegetation community considered sensitive by federal and state resource agencies, and a Tier II Uncommon Upland (City of San Diego 2012) by the MSCP. Diegan coastal sage scrub is the southern form of coastal sage scrub and is a plant community comprised of low growing, aromatic, drought-deciduous soft-woody shrubs that have an average height of approximately three to four feet. This plant community is typically dominated by facultatively drought-deciduous species such as California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*), and white sage (*Salvia apiana*). This vegetation community is typically found on low moisture-availability sites with steep, xeric slopes or clay rich soils that are slow to release stored water. These sites often include drier south- and west-facing slopes and occasionally north-facing slopes, where the community can act as a successional phase of chaparral development (Holland 1986).

Diegan coastal sage scrub will be established along the 1.48-acre earthen berm separating freshwater marsh from the riparian area (see Figure 4).

3.2.4 Additional Off-site Mitigation

If the Roundabout Alternative is accepted, areas within a City-owned parcel in Gonzales Canyon may undergo a combination of cismontane alkali marsh creation, freshwater marsh enhancement, cismontane alkali marsh restoration, and southern willow scrub enhancement. Should the Roundabout Alternative be selected and additional mitigation areas be required, similar site preparation techniques, a planting and seed palette, and a maintenance and monitoring program described above will be implemented to ensure the success criteria for the desired habitat types. Enhancement of southern willow scrub would occur at an additional mitigation area on a City-owned parcel east of San Dieguito Road. Proposed acreages per mitigation type and habitat type have been included on Figure 5; however final acreage of each activity within these habitat types will be approved following the selection of an alternative and prior to permitting of the project.

3.3 Light-footed Clapper Rail

Enhancement and restoration of habitat for the light-footed clapper rail is included in all aspects and habitat types of this Plan, from the creation of the freshwater marsh habitat to the buffer of the riparian scrub that will be created and enhanced.

Specific actions toward significantly enhancing this species' habitat include:

- Improving water quality and habitat value through the restoration of agricultural land;
- Increasing native cover and protection around breeding areas;
- Removing invasive plant species within and adjacent to the riparian corridor;
- Replanting with native riparian species where exotic species are removed; and
- Creating a new breeding and foraging habitat.

4.0 Mitigation Requirements

In general, the El Camino Real Bridge/Road Widening Project will impact upland and wetland habitat as described in the NES prepared for the project. Mitigation methods for wetland habitats will be habitat creation and enhancement, and mitigation for the construction corridor will be accomplished through restoration in the river. The City intends to use a combination of creation and enhancement at the JPA property for off-site mitigation. Off-site mitigation and on-site mitigation within the construction footprint are described in more detail below.

4.1 Off-site Mitigation

The off-site mitigation site will be used to achieve the biological mitigation requirements, consisting of creation of 15.4 acres of coastal freshwater marsh, creation of 3.0 acres of riparian scrub, and enhancement of 2.0 acres of riparian scrub (see Figure 4).

Should the Roundabout Alternative be selected, an additional 6.4 acres of mitigation would be achieved through creation of 3.1 acres of cismontane alkali marsh, 2.9 acres of freshwater marsh enhancement, and may also include 2.9 acres of cismontane alkali marsh restoration and 1.9 acres of southern willow scrub enhancement.

4.1.1 Coastal Freshwater Marsh

The coastal freshwater marsh mitigation area will be created to provide compensation for impacts to coastal freshwater marsh, disturbed coastal freshwater marsh, and disturbed coastal salt marsh impacted by the project (see Figure 4). Freshwater marsh habitat in the area appears to be favored by the light-footed clapper rail despite their typical preference for low cordgrass-dominated salt marsh habitat (ICF/Nordby Biological Consulting 2015). Details regarding habitat specifications can be found in Section 3.2.1.

4.1.2 Riparian Scrub

Riparian scrub mitigation requirements will be met by the creation of both southern willow scrub and mule fat scrub habitat types. Riparian scrub creation will be focused in areas adjacent to the costal freshwater marsh (see Figure 4).The proposed mitigation area for riparian scrub enhancement is immediately downstream of the project area. It is currently composed of mule fat and willows with a high density of salt cedar. The salt cedar and other invasive plant species will be removed to enhance the riparian corridor in this part of the river. Details regarding habitat specifications can be found in Section 3.2.2.

4.1.3 Diegan Coastal Sage Scrub

Disturbed Diegan coastal sage scrub occurs in small patches and narrow bands adjacent to developed areas. Although impacts from the bridge and road construction are proposed to be mitigated through the Habitat Acquisition Fund, there is an opportunity to create coastal sage scrub habitat along the constructed berm (see Figure 4).

4.2 Mitigation for Construction Footprint

On-site mitigation will be for areas disturbed only during construction, which includes the road and bridge construction corridor. Mitigation for the construction footprint will include returning areas temporarily impacted during construction, such as construction staging or access, back to their original condition following project completion. Habitat types to be restored in the river include riparian scrub (southern willow scrub, disturbed southern willow scrub, and disturbed mule fat scrub), and coastal brackish marsh habitat.

4.3 Timing

In order to coincide with optimal growing conditions, mitigation implementation and planting will occur from fall/early winter through the early spring months (October through January). Further, pursuant to mitigation for the project (see Mitigation Measure Bio-9, General Mitigation Measures, in the EIR for the project), implementation is required to occur outside the bird breeding season to avoid impacts to general and sensitive birds on site per MMRP requirements in the EIR. Therefore, earthwork and plant installation will be conducted from fall/early winter.

The mitigation program goals of establishing the desired species should be met within the five-year maintenance and monitoring period required for the Project. However, it may take 15 years or more for some of the vegetation communities and individual species, particularly within the riparian scrub area, to reach full maturity and habitat value. A timeline for implementation of mitigation activities is presented in Section 5.4.

5.0 Implementation Program

5.1 Adaptive Management

An adaptive management approach will be implemented as part of this Plan. Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational procedures. If operational procedures are not meeting management goals, methods are adjusted until they are achieved. Adaptive management will consist of the following key elements: establishment of management goals, identification/prioritization of issues that interfere with management goals, assessment of techniques, development/implementation of a management plan, monitoring/assessment of impacts of management actions, and periodic review of management goals and restoration methods.

5.2 Restoration Techniques

Active restoration is the process of taking specific and intentional actions to re-establish natural processes, vegetation, and habitat of an ecosystem. In the case of this Project, active restoration practices will include site preparation, non-native species removal/treatment, site grading/recontouring, earthwork (creation of earthen berm) to establish natural drainage pattern, and introduction of native plant material (container and seed) to encourage the rapid establishment of target plant species and to supplement natural recruitment of native species from the surrounding areas. The methods and materials for active restoration are described in detail in the following sections and include seed collection and container plant production, planting layout and design, plant and seed specifications, and an irrigation plan.

5.3 Qualified Personnel

5.3.1 Restoration Biologist

An experienced restoration biologist will coordinate the mitigation installation and maintenance activities. The restoration biologist will supervise these activities and provide quality assurance and control including confirming that the site is prepared properly, the invasive plant eradication measures are implemented properly, and that the seeding and planting specifications follow those outlined in this Plan. The restoration biologist will also oversee mitigation measures during the five-year monitoring and maintenance period, including qualitative and quantitative monitoring requirements.

The restoration biologist shall have the following minimum qualifications:

- A bachelor's degree in biology, ecology, botany, horticulture, or landscape planning;
- Knowledge of the vegetation associations proposed for the restoration effort including species identification, composition, canopy, understory, and species ecological positions;
- A minimum of five years of practical horticultural experience or equivalent study, including plant installation, weeding, pruning, irrigation, and pest control;
- Knowledge of avian biology, the Federal and California Endangered Species Act, the Clean Water Act, and jurisdictional boundaries;
- Storm Water Pollution Prevention 24-hour training;
- State of California Qualified Applicator License.

5.3.2 Installation Contractor

An experienced native habitat restoration contractor shall be retained to perform the mitigation installation under the direction of the restoration biologist. The installation contractor must be experienced in installing native wetland habitat mitigation areas in southern California. The installation contractor will be responsible for:

- Ordering specified plant material and seed from appropriate vendors, based on the specifications of the Plan;
- Performing earthwork in coordination with specified plans and specifications;
- Installing the plant materials per the specifications of the Plan;
- Implementing remedial actions under the direction of the restoration biologist.

5.4 Implementation Schedule

Earthwork should begin prior to the onset of the rainy season (October to November) and should be outside of the bird-breeding season (February 1–September 30). The mitigation site should be prepared and seeded/planted during the fall and early winter months to take advantage of winter rains and maximize the length of the growing season for the critical first year after installation (November to February). Planting during late spring through early fall months (late May through October) should be avoided if possible, as plants installed during these periods are subject to additional stresses that can greatly increase mortality levels. If planting during the preferred period is not possible, the irrigation plan may need to be revisited to ensure adequate growing conditions.

5.5 Site Preparation

Site preparation will consist of marking the limits of work for the mitigation area as well as the boundaries of each vegetation community to be created and enhanced within the mitigation site. Following the delineation of all areas, the restoration biologist shall identify and flag all sensitive biological resources. Once resources are flagged, non-native vegetation will need to be removed from the entire mitigation site. After all biomass is removed from the mitigation site, grading of the habitat creation sites will occur to achieve appropriate hydrology. Areas to be graded will include the mule fat/southern willow scrub creation area, and the freshwater marsh creation area.

5.5.1 Habitat Protection and Monitoring

Monitoring will be conducted during construction of the mitigation site to minimize impacts to native vegetation, sensitive species, and areas beyond construction limits. Construction monitoring will be conducted by the restoration biologist. Prior to the commencement of construction activities, the restoration biologist shall identify and flag all sensitive biological resources for protection. The monitor will then provide a letter to the City and all other appropriate resource agencies that will propose mitigation for impacts not assessed in this report that may occur during construction activities.

Construction fencing shall be installed along the boundaries of the work areas prior to vegetation removal and grading activities. The limits of work shall be clearly demarcated in the field and remain in place for the duration of implementation. In addition, the entire mitigation site will be sign-posted to deter vehicular entry on to the site during the five-year maintenance and monitoring period.

5.5.2 Best Management Practices

In order to meet the objectives of the Federal Clean Water Act "to restore and maintain the chemical, physical and biological integrity of the Nation's waters," and to meet the goals and objectives of this Plan, the proposed mitigation program has adopted BMPs for riparian and freshwater marsh mitigation.

These practical, non-regulatory guidelines shall be used during the construction of the mitigation site, the use of pesticides, grading, and all activities resulting in the alteration of the landscape in order to minimize the environmental impact of mitigation activities. BMPs offer a flexible, preventive, and non-regulatory approach to protecting water quality during construction operations. The following sections outline mitigation measures that shall be implemented during construction activities within the mitigation areas. This list is not exhaustive; additional measures may be regulated at the discretion of the Project restoration biologist or regulatory agencies. Additionally, construction monitoring for the project shall follow the *Bridge Construction Methodology & Associated Noise Reduction Measures, and Biological & Hydraulic Impacts*, which was included as an appendix to the NES (ICF/Nordby Biological Consulting 2015).

5.5.2.1 Water Quality Management Planning and Protection

- Avoid, where possible, the long- and short-term adverse impacts to water quality associated with the occupancy and modification of landscape.
- Prevent contamination from accidental spills.
- Minimize the amount of erosion and sedimentation at developed sites.

5.5.2.2 Pesticide Treatment

- Use only U.S. Environmental Protection Agency (U.S. EPA) registered pesticides and comply with all label directions for use.
- Ensure proper transportation, handling, and application according to the label.
- Avoid pesticide application during or right before significant weather events, such as heavy rainfall, which could cause runoff of pesticides.
- Store pesticides according to label directions so that spills and loss are prevented.
- Mix and load pesticides on impermeable surfaces where any accidental spills would not enter surface waters or potentially impact drinking water supplies.
- Contain and clean up spills immediately; report spills to appropriate regulatory agency.
- Dispose of containers properly; recycle if possible.
- Consider alternatives to pesticide use including biological controls and mechanical treatments.

5.5.3 Vegetation Removal

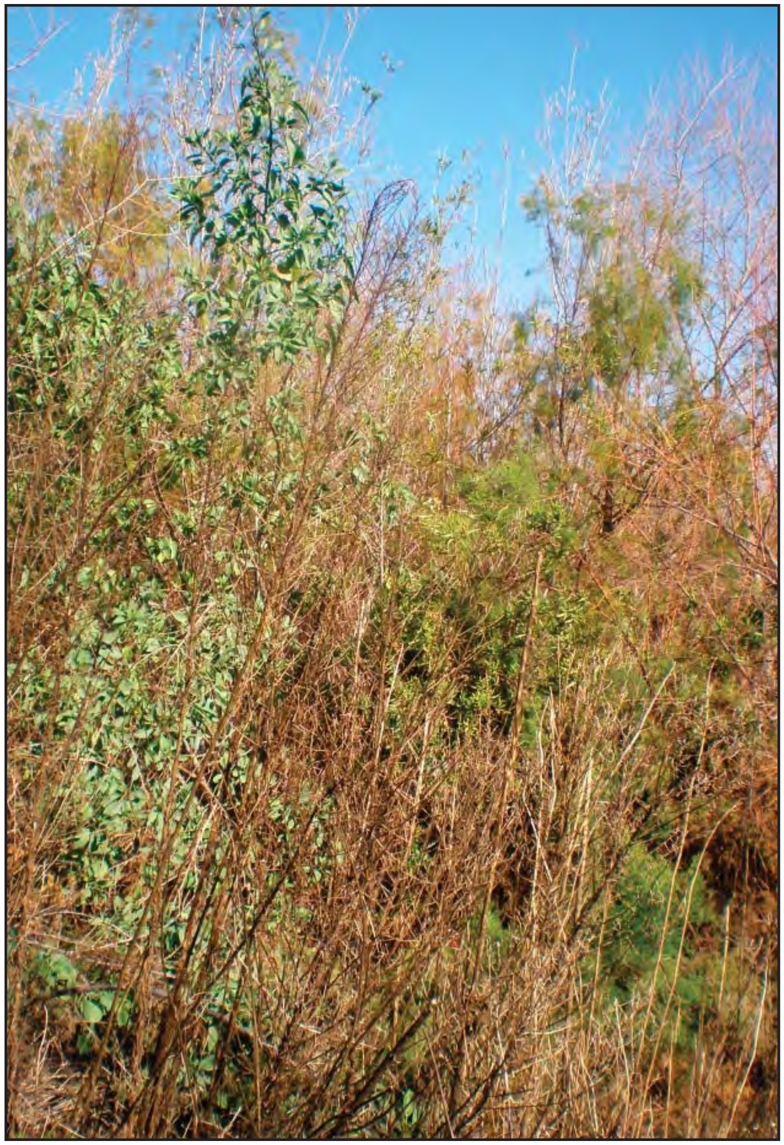
Vegetation removal will need to occur within the mitigation areas to prepare for site grading followed by container stock and seed installation. Grubbing is recommended for the entire mitigation parcel to remove all vegetation biomass including root material. Invasive plant species, including salt cedar, tree tobacco, and Russian thistle, were noted in high densities throughout the proposed mitigation site. Following initial removal, any resprouts of non-native vegetation should be controlled to limit competition with native plantings. See Section 5.6 on proper control methods for invasive plant species. Photographs 1 through 3 present some of the locations for off-site mitigation as they looked in January 2010, and Photograph 4 was taken of very large tree tobacco plants within the off-site mitigation area, indicating that fertilized soils may have an overall positive effect on native plantings.

5.5.4 Site Grading and Excavation

Grading to create wetland habitat will be required in order to lower the existing elevation after the site has been cleared and grubbed and the top six inches has been removed. The next 18 inches of topsoil should be salvaged and stockpiled on-site to later be used as topsoil for the mitigation areas. The removal of the top six inches is imperative, since

PHOTOGRAPH 1
Proposed Freshwater Marsh Creation Area, Looking Northwest, January 2010

PHOTOGRAPH 2
Proposed Riparian Scrub Enhancement Area, Looking West, January 2010



PHOTOGRAPH 3
Proposed Riparian Scrub Off-Site Mitigation Area,
Looking Southwest, January 2010

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PHOTOGRAPH 4
Large Tree Tobacco Growing in Off-Site Mitigation Area,
Looking Southwest, January 2010

this zone contains the highest concentration of non-native plant seed. Soil is to be stockpiled on-site in windrows no greater than three feet high. Site grading will result in excavation of approximately 125,000 to 254,000 cubic yards of soil. Table 1 details the estimated movement of soil by area off-site and stockpiled for later use.

TABLE 1
SOIL EXCAVATION SUMMARY BY MITIGATION AREA

Mitigation Area	Disposal Soil Volume (yd^3)	Stockpiled Soil Volume* (yd^3)
Freshwater Marsh Creation Area	64,090–192,269	27,467
Riparian Scrub Creation Area	12,100	7,260
Earthen Berm Area	n/a	n/a
Total		39,567

*Stockpiled soil to be reused as topsoil to facilitate revegetation efforts.

The restoration biologist will supervise all grading activities in the mitigation area to verify that the appropriate grading requirements are met. Proper grading is required to achieve sufficient hydrological conditions necessary to meet long-term goals and to ensure that no damage occurs to the existing utility easement or off-site parcels not specified for mitigation. Excavated soil that is exported is to be disposed of at an approved off-site location.

5.5.4.1 Hydrologic Regime

The target hydrologic regime for the mitigation areas will be supported by groundwater and the seasonal flooding of the existing river. Soil will be excavated from the mitigation site in order to achieve proper surface topography, relying on seasonal fluctuations of the water table, surface flows, and supplemental water for container plantings during the plant establishment period (PEP).

The goal of this mitigation effort is to create a mosaic of inter-related habitat types that provide habitat function and values for wildlife and are supported by a natural hydrological regime. The freshwater marsh will be created with slight variations in bottom elevation in order to create areas of open water adjacent to areas of dense vegetation. The freshwater marsh habitat associated with the San Dieguito River that currently supports clapper rails has such topographic diversity. It is apparent that the rails require dense cover for moving within the marsh and for nesting, but forage in open areas. The created site will mimic the topographic diversity and flow regime of the existing freshwater marsh associated with the San Dieguito River.

Long-term alteration to the current hydrologic regime is expected due to the creation of marsh habitat. The design of the marsh mitigation area was the result of extensive study of the hydraulics of the San Dieguito River. Those studies determined that an earthen berm parallel to the river will be required to protect the created marsh from sediment deposition. During flood events, water is expected to flow freely into the northern portion of the channel and over time increase the dynamic structure of the channel system by allowing geomorphic alterations to the existing landforms.

5.5.4.2 Coastal Freshwater Marsh

To create coastal freshwater marsh habitat, approximately 91,000 to 219,000 cubic yards of soil will need to be excavated (see Table 1). Freshwater marsh habitat will be created at approximately the same elevation as the existing freshwater marsh habitat that occurs in the riverbed near the bridge (roughly five to six feet NGVD). The existing elevation of the proposed freshwater marsh area within the off-site mitigation area ranges from approximately 11 to 17 feet NGVD. Thus, anywhere from five to 12 feet of soil must be graded, with a portion of it disposed of and a portion of it stockpiled for later use during revegetation activities.

5.5.4.3 Riparian Scrub

Approximately 19,000 cubic yards of soil will need to be excavated to create riparian scrub habitat, as shown in Table 1. The riparian scrub habitat (consisting of mule fat and southern willow scrub vegetation) will be created at the same elevation as the existing riparian scrub corridor along the San Dieguito River, which is roughly seven to eight feet NGVD. This will require the removal of approximately four feet of existing soil.

In addition, degraded riparian habitat will be enhanced in an area along the San Dieguito River. Soil does not need to be excavated from this area; however, several invasive plant species will be removed, including salt cedar and eucalyptus (*Eucalyptus* spp.), among others.

5.5.4.4 Earthen Berm

A berm will be constructed parallel to the river, extending laterally near the existing bridge and immediately south of the riparian scrub creation area (see Figure 4). This berm will run in a westerly direction from the existing El Camino Real bridge alignment for approximately 1,100 feet and will be about 1.41 acres in size. The berm will have a 10-foot top width, and will be constructed at a 2.5:1 slope on the channel side of the berm, and a 2:1 slope facing into the mitigation area. An armored weir will be constructed within the berm approximately three feet lower than the top of the berm. This weir will be approximately 250 feet long and will allow water to flow through the constructed wetland during large flood events while excluding bedload sediment (sand). The portion of the berm that will parallel the main river channel will be protected with Turf Reinforcement Matting (TRM) along the north-facing slope (adjacent to main channel) and will be fully vegetated and planted with native upland species (see Section 5.7 for Planting Plan). The remaining portions of the berm (i.e., the inside slopes facing the mitigation area) will also be vegetated and planted with native upland species; however, they will not require the installation of TRM.

5.6 Invasive Plant Species Control Program

The restoration biologist will supervise the control and eradication of invasive plant species from the mitigation area. Species to be controlled include salt cedar, tree tobacco, Russian thistle, castor bean, black mustard (*Brassica nigra*), and non-native grasses (*Bromus* spp.). Other species that may be found on-site shall be eradicated under the guidance of the restoration biologist.

Invasive plant species control will require effort throughout the five-year maintenance and monitoring period to achieve effective control. Many invasive plants require repeated and properly timed control measures. In addition, propagules are likely to wash or blow into the mitigation site and recolonize it. The Maintenance Program includes an ongoing exotic control component (see Section 6.3.1).

The restoration biologist will oversee the weed control operations and determine if, at any time, chemical control is to be used. The type, quantity, and method of herbicide application will be determined by a qualified licensed professional who will inspect the site and recommend methods of application and rates to the restoration biologist. Pesticide recommendations shall be limited to those appropriate for native habitat restoration, including the use of only aquatic pesticides near open water. The restoration biologist will approve the rates, methods, and areas to which pesticides are to be applied.

5.6.1 Control Methods

Controlling weeds in riverine environments requires selecting one or more control mechanisms—mechanical, cultural, biological, and chemical. Of these four methods, chemical control is most frequently used because herbicides are an economical way to control most wetland weeds in a quick and thorough manner (O'Connor–Marer and Garvey 2001). However, in some cases, the other three methods, or a combination of other methods, may provide the most effective results.

Control of non-native species is to occur within the entirety of the area and within a 50-foot buffer (where applicable) surrounding the site to reduce the encroachment potential of invasive plant species.

5.6.1.1 Mechanical Control

Mechanical control involves cutting or removing weeds by machine or by hand. Mechanical control provides immediate clearing of the infested area, and no lag time is necessary between removal activities and revegetation. Mechanical control methods are often costly because they are either labor intensive or require the use of heavy machinery.

5.6.1.2 Cultural Control

Cultural control requires altering the environment to inhibit the growth of riparian weeds. These control methods include the control and manipulation of water, nutrients, dyes, bottom barriers, or aeration. Many of these controls are more practical in small bodies of water such as stock ponds, detention basins, or small recreational lakes. No cultural control methods are identified at this time; however, their use may be relevant in the future under the guidance of the restoration biologist.

5.6.1.3 Chemical Control

The use of herbicides to control non-native weeds has both advantages and disadvantages. The use of herbicides is often the quickest and most cost-effective method for controlling invasive plants. Herbicides are easy to apply and require relatively little application time. All herbicides carry labels that are legal documents describing the ingredients, intended use, cautionary statements and health hazards, application rates, and other information. Violations of these instructions are violations of the law and could subject the user to fines and possible imprisonment. Since these labels and their legal uses change, the most recent label should be referenced before any recommendation for herbicide use is made.

Herbicides currently available for application on the target species are limited due to label restrictions and efficacy. However, application of herbicides can be one of the most effective tools for control and long-term management of invasive plants. Herbicides are effective when used alone to control infestations, but are often used in conjunction with other techniques such as cutting or mowing. The use of herbicides can substantially increase mortality rates of persistent invasive plants, reducing the need for mechanical excavation of roots and rhizomes and associated soil disturbances. The utility of herbicide application to control these target species can be affected by its relatively high initial cost, restrictions on use in proximity to water, the degree of intermixing of invasive plants with natives, and the presence of sensitive species. These factors can all restrict the type of herbicide allowed, the location and timing of use and the method of application.

A successful herbicide application as a means of control depends primarily upon selecting the appropriate herbicide for the task and adhering to label requirements. Many herbicides are prohibited for use around open water, and most exhibit seasonal variations in effectiveness. The most effective method of application can vary among brands and types of herbicides. Most herbicides perform better with the use of an adjuvant, which may be included in the product or added prior to application to increase effectiveness. An adjuvant is a substance other than water which is not in itself an herbicide but which enhances the effectiveness of the herbicide with which it is used. Colorants are also often added to herbicide solutions to enable spray crews to provide consistent and thorough application. Listed below are the herbicides anticipated to be used on the mitigation areas.

Glyphosate is a broad-spectrum, non-selective systemic herbicide. Glyphosate can be used on most invasive species. The EPA has approved several glyphosate-based products (i.e., Aquamaster®, Aquaneat®, Aquapro®) for use in aquatic environments, making glyphosate the primary herbicide for use throughout the mitigation area. Other glyphosate-based products are only approved for use in areas where water is not present (i.e., Roundup®, Buccaneer®, Makaze®, and Prosecutor®). Glyphosate is most effective when used on perennial plants when applied in the late summer and fall when the plant is entering dormancy; this permits transmission of the herbicide to the plant's root system.

Imazapyr is a broad-spectrum imidazolinone herbicide used to control grasses, broadleaves, vines, brambles, brush, and trees. Imazapyr (i.e., Habitat®, Polaris®) can also be used to treat all species in or around surface water. Imazapyr works by disrupting an enzyme (found only in plants) necessary for protein synthesis and interfering with cell growth and DNA synthesis in plants. Moreover, Habitat®, Polaris®, and others are labeled for use in aquatic environments. Unlike glyphosate, there is the potential to damage adjacent non-target plants by transfer between root networks.

Triclopyr, a pyridine, is a selective systemic herbicide used for control of woody and broadleaf plants along rights-of-way, on industrial lands, and on grasslands. Triclopyr can be used to treat salt cedar and pepper trees (*Schinus* sp.), and is a selective systemic herbicide. It has little or no impact on grasses (i.e., giant reed). Triclopyr is the active ingredient in Garlon® and Pathfinder® formulations. Garlon 4® and Pathfinder II® are approved for terrestrial habitats. Garlon 3A® is approved for use in closed aquatic habitats such as wetlands and lakes. It is not allowed for use on streams and rivers. Triclopyr will only be used for foliar application outside of USACE jurisdictional areas.

5.6.2 Target Invasive Plant Species

This section defines and describes management goals for the most invasive plant species expected to occur within the project area. Each species account includes a brief description of appearance and management recommendations.

5.6.2.1 Giant Reed (*Arundo donax*)

Description: Giant reed is a tall perennial grass with large light-green to light-blue leaves. The species is widespread throughout California at elevations below 1,000 feet, and is particularly problematic in coastal drainages. Mature plants can grow up to 20 feet tall and are commonly found in riparian areas, ditches, seeps, and disturbed areas.

Management Recommendations: The key to giant reed removal over the long-term is killing the root mass. This requires treatment of the plant with a systematic herbicide at appropriate times of year to ensure translocation to the roots. During the post-flowering and pre-dormancy period (usually mid-August to early November), the plants are actively translocating nutrients to the root mass in preparation for winter dormancy. Currently, aquatic glyphosate and aquatic imazapyr are the only effective herbicides that are approved for use in riverine ecosystems. Once the plant is dead, either the biomass may be left in place where populations are sparse, or cut down and removed from the site. The cut-stump method may also be used which involves cutting near the base of the stalk. After the stems are cut, a concentrated herbicide must be applied to the cut stem within one to two minutes in order to ensure uptake into the plant's tissues (Monsanto Company 1989).

5.6.2.2 Salt Cedar (*Tamarix* spp.)

Description: Salt cedar is a noxious weed that thrives along streams and riverbanks, lake and pond margins, canals, ditches, and any other area with available surface or subsurface water. Salt cedar is frequently found on saline soils where most native riparian plants are not able to survive (Lovich 2000). Salt cedar has a high reproductive rate, with an individual plant producing up to 500,000 seeds per year (DiTomaso 1996). These seeds are dispersed by wind and water.

Management Recommendations: The cut-stump method is the most effective and frequently used method of salt cedar removal in California. A triclopyr, glyphosate, or imazapyr herbicide should be applied to the cut stump immediately (in less than 30 seconds). This technique usually results in a 90 percent kill rate. All cut material should be bagged and carried off-site. Treatment of mature trees should be avoided during summer months in areas where nesting birds occur.

5.6.2.3 Pampas Grass (*Cortaderia* spp.)

Description: Pampas grass is a robust tussock grass that grows up to 11 feet in diameter, and has flowering stalks that can reach upwards to 13 feet in height. The leaves are gray or bluish–green with narrowly tapering tips. Pampas grass is often found in open sunny places that receive added moisture and becomes naturalized as a weed in damp places, depressions, along stream banks, the margins of mangrove swamps, and, in particular, disturbed areas associated with roads, pipeline cuts, and walking trails in forest areas (Global Invasive Species Database 2006).

Management Recommendations: Pulling or hand-grubbing pampas grass seedlings is highly effective. For larger plants, however, a Pulaski (axe on one end and hoe on the other), mattock (pick on one end and hoe on the other), or long-bladed shovel is the safest and most effective way of removing established clumps. A large chainsaw or weed eater can expose the base of the plant, allow better access for removal of the crown, and make disposal of the removed plant more manageable. Control of pampas grass can be achieved by spot treatment with the application of glyphosate (Invasive Plant Science and Management 2008). Fall applications result in better control compared to summer applications.

5.6.2.4 Tree Tobacco (*Nicotiana glauca*)

Description: Tree tobacco is a member of the Solanaceae family and is a loose-branching, small, evergreen tree or shrub between six and 18 feet tall. The leaves are thick, rubbery, lance-shaped, and less than 10 inches long. The flowers open at night and are yellow and trumpet shaped, with the stamens attached below the middle of the tube, and bloom year round. All parts of the plant are extremely poisonous. Tree tobacco is found in open, disturbed flats or slopes below 3,000 feet. First planted as a landscape ornamental, tree tobacco can now be found widespread along roadsides, disturbed sites, waste areas, riparian areas, and recently burned sites.

Management Recommendations: The areas within the mitigation site where tree tobacco is growing will be grubbed prior to grading. All tree tobacco biomass will be removed from the site. Any regrowth of this invasive plant should be controlled with a glyphosate-based herbicide through foliar treatment.

5.6.2.5 Castor Bean (*Ricinus communis*)

Description: Castor bean is a perennial shrub that grows three to 15 feet tall, with large palmately lobed leaves and sharply toothed leaf margins. The leaves are usually deep green, but may have a reddish cast. Castor bean spreads by seed and is capable of resprouting from the root crown. Castor bean is frequently found in riparian areas and drainages, where it displaces native plant species. Its seeds are among the first to germinate following fire and disturbance, and the plants grow rapidly, shading out native seeds and seedlings.

Management Recommendations: Small plants in wet, sandy soils may be pulled by hand, making sure to remove the bulk of the root, as plants broken at the root crown will regenerate with multiple shoots. The cut-stump method is most effective for larger plants; stumps should be spot-sprayed with a glyphosate-based herbicide.

5.6.2.6 Perennial Pepperweed (*Lepidium latifolium*)

Description: Perennial pepperweed belongs to the mustard or *Brassicaceae* family. An erect, branching perennial weed grows one to three feet high, but may reach heights of eight feet in wet areas. Perennial pepperweed is adapted to a wide range of ecological sites, which allows it to have a large geographical distribution. In the Intermountain West, the plant's distribution corresponds to riverine systems and riparian zones, which are the primary areas of invasion in most states. However, perennial pepperweed is not limited to riparian zones and is found in disturbed areas, ditches, roadsides, pastures, and residential areas as well. The plant can tolerate coastal salt concentration in soils, but is not limited to these sites.

Management Recommendations: Imazapyr herbicides, such as Habitat®, will kill the shoots of perennial pepperweed, but root crowns will quickly sprout new foliage (Krueger and Sheley 1999). Repeated applications for up to five years are necessary to starve the root system. In order to manage perennial pepperweed with chemicals successfully, competitive vegetation must be established immediately after its control to prevent reinvasion.

5.6.2.7 Eucalyptus (*Eucalyptus* spp.)

Description: Eucalyptus is a hardwood invasive tree species that spreads by suckers and seeds. It is considered undesirable in natural areas, as it consumes very large amounts of water to fuel its rapid growth. Eucalyptus also burns readily due to its volatile chemical compounds (terpenes and derivatives, furan and pyran compounds, ketones, benzene) and is known to have high fuel loadings for wildfires. It has a tendency to resprout along its trunk within three to six weeks, out-competing native species.

Management Recommendations: The cut-stump method is an effective and a frequently used method of eucalyptus removal. A triclopyr or glyphosate-based herbicide should be applied to the cut-stump within three minutes of cutting to prevent resprouting. Herbicide injection is also an effective method of eucalyptus removal. Holes are drilled every few centimeters, depending on trunk size, around the entire circumference of the tree using a 5/16 inch (or larger) drill bit at a downward angle through the bark and into the cambium layer. Each hole is filled with a concentrated dose of glyphosate and refilled on bigger trees. Eucalyptus trees as large as 60 to 90 centimeters in diameter can be successfully killed in this manner. Depending on the size of the tree, either the cut-stump or the injection method will be used.

5.6.2.8 Russian Thistle (*Salsola tragus*)

Description: Russian thistle, a member of the Chenopodiaceae family, is a dense intricately branched annual. The plant forms a roundish, bushy clump, growing one to four feet tall. The leaves are 1.25 to two inches long, alternate, very slender, and end with a sharp prickly point. Bisexual flowers are in the leaf axils and look like membranous saucers, pink or reddish in the center and no petals. Russian thistle, an extremely common inhabitant of many plant communities in waste and disturbed areas and cultivated fields, blooms from July to October. In the fall, it often breaks off at ground level and tumbles along the ground dropping its seeds, which are black and shining.

Management Recommendations: Russian thistle within the mitigation site will be removed when the site is grubbed prior to grading. Russian thistle seedlings should be spot-sprayed with a glyphosate-based herbicide.

5.6.2.9 Fivehook Bassia (*Bassia hyssopifolia*)

Description: Fivehook bassia is a member of the Chenopodiaceae family and is an annual plant native of Asia and introduced from Europe. It can grow anywhere from one to six feet tall with stems branched, slender and often red-tinged. Flowers are inconspicuous and form short, dense, bracted spikes. Fivehook bassia can be distinguished by the five hooked structures on each seed. This plant is commonly found in cultivated fields, roadsides, and other disturbed areas.

Management Recommendations: All fivehook bassia will be removed from the mitigation site when the site is grubbed prior to grading. Fivehook bassia resprouts should be spot-sprayed with a glyphosate-based herbicide.

5.6.2.10 Crystalline iceplant (*Mesembryanthemum crystallinum*)

Description: Crystalline iceplant, a member of the Aizoaceae family, is a succulent, low-growing annual (biennial) herb with flat, fleshy leaves. The leaves and stems are covered with distinctive minuscule, transparent, blister-like out growths and the small, radial flowers have many narrow petals that range from white to pinkish, depending upon the age of the flower (Cal-IPC 2006). The stems range from green to red and usually trail along the soil surface.

Management Recommendations: Crystalline iceplant should be removed from the mitigation site when the site is grubbed prior to grading. If any of the iceplant becomes re-established prior to plant installation it should be sprayed with a glyphosate-based herbicide and left in place. Once it has dried out, it should be rolled up and removed from the site.

5.7 Planting Plan

The planting plan for the mitigation site incorporates a combination of container plants, cuttings, seed, and native volunteer recruitment to create the basic structure of the desired habitat. The planting plan will be based on the specifications defined herein after treatment of invasive plant species. All active restoration areas will be planted using standard horticultural practices, as outlined below.

This section covers activities relating to the installation of the mitigation areas; including seed and container plant sources, seed mix, salvaging of plant material, and seeding specifications. Specifications shall be followed in implementing the mitigation and shall be documented at the end of the installation phase. The final plant installation will be reviewed and approved by the restoration biologist.

The habitat types that are expected to be restored following site preparation include coastal freshwater marsh, riparian scrub and Diegan coastal sage scrub habitats. Natural recruitment will play a major role in these habitats becoming established, but container plants will also be introduced into active restoration areas to speed up the revegetation process.

Exact planting design will be determined following site preparation and once the hydrology and topography of the site has been assessed. Plant palette tables are to be used as guidelines (see Tables 3 through 8). The proportions and quantities of these species will be determined based on site conditions at the discretion of the restoration biologist.

5.7.1 Coastal Freshwater Marsh

This planting plan is for the coastal freshwater marsh creation area within the mitigation site. The creation of coastal freshwater marsh habitat will include the installation of perennial herbaceous species established from container stock. The planting palette for this habitat has been designed to mimic existing coastal freshwater marsh habitat in the area near the bridge and includes planting densities and container sizes proposed in the Park Master Plan for the Coastal Area of the San Dieguito River Valley Regional Open Space Park (JPA 2000). The proposed plant species include traditional freshwater marsh species and a few salt marsh species including but not limited to saltgrass (*Distichlis spicata*), spiny rush (*Juncus acutus*), and salt heliotrope (*Heliotropium curassavicum*). Recommended plant and seed mix consider the presence of salt marsh species observed on-site. All species except southern cattail will be planted from container stock grown from seed or cuttings collected within the project site. Southern cattail is expected to colonize the site naturally from existing populations within the region. Spacing and densities are presented in Table 2.

After the removal of non-native vegetation, the coastal freshwater marsh mitigation area shall be installed with the container plants and seed listed in Tables 2 and 3. These guidelines are to be used as a reference for container size, maximum number per acre, and spacing. The total number of individual species per acre will be determined by the restoration biologist.

TABLE 2
COASTAL FRESHWATER MARSH CONTAINER PLANT PALETTE

Scientific Name	Common Name	Container Size	Percent Composition	Spacing on Center (initial planting)
Anemopsis californica	Yerba mansa	4-inch pot	10	2 ft.
Distichlis spicata	Saltgrass	4-inch pot	5	3 ft.
Eleocharis macrostachya	Pale spike rush	1-gallon	5	3 ft.
Heliotropium curassavicum	Salt heliotrope	4-inch pot	5	3 ft.
Juncus acutus	Spiny rush	1-gallon	15	6 ft.
Juncus mexicanus	Mexican rush	1-gallon	5	3 ft.
Pluchea odorata	Salt marsh fleabane	1-gallon	5	3 ft.
Rumex salicifolius	Willow dock	1-gallon	5	3 ft.
Schoenoplectus maritimus	Alkali bulrush	1-gallon	7	3 ft.
Scirpus californicus	California bulrush	1-gallon	8	3 ft.

TABLE 3
COASTAL FRESHWATER MARSH SEED MIX

Scientific Name	Common Name	Pounds/Acre	Total Pounds*
Anemopsis californica	Yerba mansa	8	123
Artemisia douglasiana	Mugwort	3	46
Eleocharis macrostachya	Pale spike rush	4	62
Juncus acutus	Spiny rush	2	31
Juncus dubius	Mariposa rush	2	31
Pluchea odorata	Salt marsh fleabane	3	46
Total		22	339

*Acreage = 15.4 acres. Total pounds are approximate.

5.7.2 Diegan Coastal Sage Scrub (earthen berm)

To create the coastal freshwater marsh mitigation area, an earthen berm parallel to the San Dieguito River, approximately 1.41 acres in size, shall be constructed in order to protect the marsh from sediment deposition. As described in the NES Report (TES 2006; ICF/Nordby Biological Consulting 2015), the berm will be 10 feet wide on the top and will stand approximately seven to 10 feet above the current ground level. The north-facing slope of this berm (adjacent to the main channel) will be seeded with native upland plant species. The earthen berm is to be hand-seeded and raked into the soil. The recommended plant palette for the earthen berm is included in Table 4.

TABLE 4
DIEGAN COASTAL SAGE SCRUB BERM SEED MIX

Scientific Name	Common Name	Pounds/Acre	Total Pounds
Ambrosia psilostachya	Western ragweed	0.75	1.06
Artemisia californica	California sagebrush	3.5	4.94
Castilleja exserta	Owl's clover	0.25	0.35
Encelia californica	California encelia	3.5	4.94
Eriogonum fasciculatum	California buckwheat	3.25	4.58
Eschscholzia californica	California poppy	1.75	2.47
Isocoma menziesii	Coast goldenbush	1.25	1.76
Lupinus bicolor	Miniature lupine	1.5	2.12
Mimulus aurantiacus	Bush monkeyflower	0.5	0.71
Stipa pulchra	Purple needlegrass	2.5	3.53
Phacelia parryi	Parry's phacelia	1.25	1.76
Plantago ovata	Woolly plantain	2.25	3.17
Saliva mellifera	Black sage	2.75	3.88
Total		25.0	35.27

*Acreage = 1.41 acres. Total pounds are approximate.

5.7.3 Riparian Scrub

Riparian scrub, composed of southern willow scrub and mule fat scrub, will be planted with willow species and mule fat along with various understory species typically found within riparian scrub habitat. Willows and mule fat will be planted from one-gallon containers and cuttings installed on approximately 10-foot centers. Containers will be planted in augered holes to facilitate taproot development. Container stock will be planted in groups to allow open areas for seeded understory plants. Shrub and grass species are also included in the planting palette, and include southwestern spiny rush (*Juncus acutus* spp. *leopoldii*), San Diego marsh elder (*Iva hayesiana*), and giant wild rye (*Elymus condensatus*). These species, among others, will provide native plant diversity and food sources for wildlife.

Several species will also be seeded. Some of these species include western ragweed (*Ambrosia psilostachya*), Palmer's sagewort (*Artemisia palmeri*), Douglas mugwort (*Artemisia douglasiana*), and creeping wild rye (*Leymus triticoides*). Seeds will be collected within the project area or within a 15-mile radius of the Project to retain genetic integrity.

The restoration biologist will determine the total number of individual species per acre and the difference between southern willow scrub and mule fat scrub species. Table 5 includes guidelines to be used as a reference for container size, maximum number per acre, and spacing, and Table 6 includes a recommended seed mix for the riparian scrub area.

TABLE 5
RIPARIAN SCRUB CONTAINER PLANT PALETTE

Scientific Name	Common Name	Container Size	Plants/ acre	Spacing on Center (initial planting)
Artemisia palmeri	Palmer's sagewort	1-gallon	60	3 ft.
Baccharis salicifolia	Mule fat	1-gallon/cuttings	400	10 ft.
Iva hayesiana	San Diego marsh elder	1-gallon	200	6 ft.
Leymus condensatus	Giant ryegrass	1-gallon	200	3 ft.
Muhlenbergia rigens	Deergrass	1-gallon	100	3 ft.
Pluchea odorata	Salt marsh fleabane	1-gallon	100	3 ft.
Pluchea sericea	Arrow-weed	1-gallon	80	3 ft.
Salix exigua	Narrow-leaved willow	1-gallon/cuttings	100	10 ft.
Salix gooddingii	Goodding's black willow	1-gallon/cuttings	80	10 ft.
Salix laevigata	Red willow	1-gallon/cuttings	200	10 ft.
Salix lasiolepis	Arroyo willow	1-gallon/cuttings	200	10 ft.
Sambucus mexicana	Blue elderberry	1-gallon	50	10 ft.
Vitis girdiana	Wild grape	1-gallon	100	3 ft.

TABLE 6
RIPARIAN SCRUB SEED MIX

Scientific Name	Common Name	Pounds/Acre	Total Pounds
Ambrosia psilostachya	Western ragweed	4	25
Artemisia douglasiana	Mugwort	5	31
Artemisia palmeri	Palmer's sagewort	2	13
Baccharis salicifolia	Mule fat	4	25
Carex alma	Sedge	2	13
Eleocharis macrostachya	Common spike-rush	2	13
Iva hayesiana	San Diego marsh elder	4	25
Juncus acutus ssp. *leopoldii*	Southwestern spiny rush	2	13
Leymus triticoides	Creeping wild rye	5	31
Muhlenbergia rigens	Deergrass	3	19
Oenothera elata ssp. hookeri	Hooker's evening primrose	1	6
Pluchea odorata	Salt marsh fleabane	2	13
Pluchea sericea	Arrow-weed	2	13
Total		36	240

*Acreage = 6.25 acres. Total pounds is approximate.

5.7.4 Construction Corridor

The planting plan for the construction corridor applies to areas temporarily impacted by proposed construction activities for the bridge and road. This includes the revegetation of the coastal brackish marsh areas disturbed in the ditches parallel to Via de la Valle and El Camino Real, and in the San Dieguito River, along with any riparian scrub temporarily impacted by the project. After the project is completed, the areas will be planted and seeded with the plant palettes shown in the above-referenced tables dependent on habitat type (Tables 3 through 8). These guidelines are to be used as a reference for container size, maximum number per acre, and spacing. The total number of individual species per acre will be determined by the restoration biologist.

5.8 Specifications

This section addresses all activities relating to the installation of the mitigation program, including source material (seed and cutting collection, and plant production), substitutions, plant inspections, container plant practices, seeding specifications, cutting specifications, guarantees, and an irrigation plan. Specifications shall be followed in implementing the mitigation project and shall be included as part of the construction document specifications package. The mitigation installation will be reviewed and approved by the restoration biologist.

5.8.1 Source Material

5.8.1.1 Seed and Cutting Collection

At least six months before restoration activities begin and continuing as needed for the duration of the maintenance and monitoring period, native seed and willow pole cuttings will be collected in and around the project area, as directed by the restoration biologist. In the first year, seed collection should focus primarily on the dominant perennials, grasses, and annuals, but the restoration biologist will endeavor to collect seed from all native species that may be found in all habitat types that will be restored. Seed will only be collected outside of the project area if there is not sufficient seed present in the project area or if additional species are needed. Seed and cutting collection areas will be limited to a 15-mile radius around the project area, but it is likely that all of the source material will come from within the San Dieguito River project area.

5.8.1.2 Plant Production

Container plants will be grown at an off-site nursery that specializes in producing high-quality native plant species for habitat restoration projects (such as RECON Native Plants or equivalent). Plant production will begin as seed and cuttings become available. Native soil will be used in the plant containers. If more native soil is needed than is available to fill plant containers, each container should receive some native soil mixed with an appropriate commercial nursery soil mix. The native soil in the container mix will inoculate mycorrhizae (fungi) and other microorganisms to the plant, which enhances native plant growth. The mycorrhizae present in native soil are superior to commercially available mycorrhizae since it possesses specific fungus-plant associations to the types of plants being planted and may inhibit ruderal plant growth. Container plants should be grown outdoors and in full sunlight. Prior to container plants being delivered to the project site, they should be hardened off from water, so they may be able to sustain themselves under potential drought conditions once planted.

5.8.2 Substitutions

The native habitat landscape contractor is expected to secure the necessary plant material prior to the expected planting date. In general, no substitutions above 10 percent of any specified species number will be allowed, and must be approved in advance by the restoration biologist.

5.8.3 Plant Inspections

All plants will be inspected by the restoration biologist and approved as healthy, disease free, and of proper size prior to planting. In addition, the restoration biologist will approve the final layout of all plant materials in the field prior to planting.

5.8.4 Container Plant Practices

Container plants will be planted using standard horticultural practices, using a hole at least twice the diameter of the root ball and leaving the plant crown one to two inches above grade after planting. All plants will be thoroughly watered in their pots before planting, and the soil in all planting holes will be thoroughly wetted before planting. The restoration biologist may specify additional soil amendments, as necessary.

5.8.5 Seeding Specifications

Seeding activities in the mitigation areas will occur after all container plants have been installed and weed eradication is complete. The mitigation areas may be hand-seeded with the seed mixes shown in Tables 3, 4 and 5. Seeding activities will proceed only after the restoration biologist certifies that the site preparation has been completed. Seed quality will be the most obtainable in the year of application for both purity and germination. As much as possible, the seed should be collected from the project site and the range of seed collection shall be limited to within a 15-mile radius of the project area to maintain genetic integrity. The amount of seed purchased and location collected will be provided in writing to the restoration biologist.

5.9 Irrigation Plan

The goal of habitat restoration is to create habitats that will persist over time and be self-supporting. Planting should be timed to occur during the winter and spring months in order to take advantage of cooler temperatures and seasonal rainfall. It is assumed that the mitigation site will naturally have saturated soils and adequate water under natural seasonal conditions to provide enough moisture to allow the container plants to become established. However, a temporary irrigation system should be installed at the riparian scrub and earthen berm areas to help the plants become established. A water source will be required for the irrigation system. It is anticipated that groundwater can be pumped to be used in the irrigation system as was done to irrigate the agricultural fields. Installation of the irrigation system will be completed prior to planting. If there are no nearby pipes, an alternative solution, such as a water truck, will be implemented. The irrigation design shall be approved by the restoration biologist and must demonstrate appropriate coverage and frequency of watering for plant establishment.

Water use is expected to be highest during the first growing season, tapering off gradually until no supplemental water is necessary. Local drought conditions will also be considered when evaluating the need and time period for supplemental irrigation. Supplemental watering will be discontinued at least two years prior to the end of the five-year maintenance program.

6.0 Maintenance Program

The purpose of the five-year maintenance program is to ensure the success of the mitigation planting and to allow native plants to establish and become self-sustaining. Maintenance is needed to create and maintain conditions favorable to establishment and growth of native plants. The maintenance program ensures that native species are being allowed to recruit, container plants are becoming established, and weeds are under control. Maintenance measures will be conducted throughout all mitigation areas and will be coordinated by the restoration biologist. Maintenance will consist of two phases: the PEP and long-term maintenance. The restoration biologist will oversee all aspects of the mitigation program in order to detect problems at the earliest stage.

Maintenance activities expected to be necessary during the maintenance program include weed control, irrigation system management, herbivory protection, trash removal, remedial planting, and access control.

Maintenance of the mitigation site will continue until the objectives of the plan are met. Success of the plantings will be assessed annually after installation. Plantings within the mitigation areas must achieve the specified goals of plant survival and coverage prior to meeting contractual obligations.

6.1 Schedule

The five-year maintenance program begins when the installation has been certified as complete by the restoration biologist. Often, success criteria are achievable by the end of Year 3. Therefore, the need for additional maintenance beyond Year 3 will be determined at the end of that year. Maintenance inspections will be conducted concurrently with biological monitoring of the site. Thus, maintenance inspections will be conducted monthly for the first 18 months after installation, approximately bimonthly for the next 18 months, and quarterly thereafter for the remainder of the five-year maintenance period following the PEP.

Specific maintenance activities will be determined by observations made during the scheduled site visits described above. Plant replacement, repairs to the irrigation system, erosion control and other remedial actions to correct problems or damage resulting from natural causes, vandalism or other factors that may jeopardize the successful completion of the project will be performed promptly, generally within two weeks of identification of the problem.

6.2 Plant Establishment Period

A 120-day PEP will commence upon planting of the container plants in the mitigation areas. During this period, relatively intensive maintenance activities will be conducted to aid in the establishment of container plantings under the direction of the restoration biologist. The maintenance crew will control emerging weed seedlings, replace dead plants, and remove any trash from the mitigation site.

If excessive damage from animals (i.e., browsing or trampling) is detected, individual plants may be protected by temporary installation of a chicken-wire fence around each plant. However, since browsing is a natural process, fencing will only be installed if browsing is expected to result in excessive plant mortality that would jeopardize the overall success of the project.

6.3 Long-term Maintenance

Long-term maintenance is directed at maintaining favorable general site conditions rather than to aid in establishment and protection of individual plants. Weed control will be the primary ongoing activity, while replanting may be performed, as needed, under the direction of the restoration biologist. The recommended schedule for long-term maintenance is shown in Table 7.

TABLE 7
APPROXIMATE MAINTENANCE SCHEDULE*

Task	PEP	Year 1	Year 2	Year 3	Year 4	Year 5
Weed control	Weekly	Monthly for 8 months	Monthly for first 6 months, bimonthly for second 6 months	Bimonthly for 12 months	Quarterly	Quarterly
Replanting	--	Fall	Fall	--	--	--
Irrigation	As needed	As needed	As needed	--	--	--

PEP = Plant Establishment Period (120 days)

6.3.1 Weed Control

Weed control will be an integral part of the five-year maintenance program. Weeds will be controlled through one of the means described in Section 5.6.1. A glyphosate-based herbicide approved for use in wetlands will be applied in most cases, but selective herbicides may also be applied to control specific types of weeds, as directed by the restoration biologist. Weeding will be performed by maintenance personnel familiar with and trained to distinguish weeds from native species. Emphasis will be on keeping weed species from producing seeds and controlling weed competition during establishment of the plants. Invasive species anticipated on the mitigation site are described in Section 5.6.2.

Weed control will be timed to prevent seed set by non-native species. During the first year after the PEP, weeding will be performed monthly, depending on site conditions. During Year 2, weeding shall be performed monthly for the first six months and bimonthly for the last six months. Bimonthly weeding will be performed during Year 3 and quarterly for Years 4 and 5. If necessary, the frequency of weeding visits may be modified, as determined by the restoration biologist.

The bird-breeding season strongly correlates with the weed growing season (February 1–September 30); therefore, it may be necessary to coordinate restoration activities with bird biologists to avoid any disturbance to sensitive species. The restoration biologist will be in close communication with the bird biologists to ensure that sensitive areas are being avoided during bird-breeding seasons. If a bird nest is observed within an area that should be treated during the bird-breeding season, the bird biologist will be consulted to establish an appropriate buffer to establish such that the breeding birds will not be disturbed while management activities continue.

6.3.2 Remedial Planting

If the performance standards, as established in Section 7.1, are not achieved because of disease, vandalism, or other natural causes, remedial planting will be necessary. Replanting will be conducted when soil moisture is optimal, between the months of October and March, as determined by the restoration biologist. In areas that do not establish well, or do not reflect the dominant and subdominant species of the reference sites, remedial seeding may also be recommended by the restoration biologist. Planting and seeding methods and specifications will be the same as those described for the PEP.

6.3.3 Vandalism

The mitigation area should be protected and maintained from vandalism, breakage of the irrigation system, uprooting of plantings, off-road vehicle activity, and illegal trash dumping by the installation of an appropriate access barrier. Posted signs designating the area as a mitigation site may deter casual vandalism.

7.0 Monitoring Program

The monitoring activities for on- and off-site mitigation areas are described in detail below. To determine if the mitigation site is functioning as expected, qualitative and quantitative monitoring will be conducted for five years or until final performance standards are achieved, whichever is shorter. Monitoring surveys will concentrate initially on qualitative observations to identify potential problems and recommend remedial maintenance actions, where necessary. Remedial actions may be necessary to address factors that could jeopardize attainment of the criteria for success. Ultimately, the success of the Plan will be evaluated by comparing the final year of monitoring data with project performance standards. The monitoring data will evaluate the functions and values of restored habitat, native and non-native vegetative cover, species diversity, and density. At the completion of any monitoring year, if all final performance standards have been achieved, further monitoring of the site will not be necessary and the mitigation site will be deemed a success.

7.1 Performance Standards

This section defines a set of yearly performance standards for evaluating the progress of the mitigation program. These standards will be used to monitor site development and to decide when to implement remedial measures to correct any deficiencies in progress. Performance standards will be assessed by the restoration biologist based on distinguishable criteria outlined in this Plan. Performance standards are characteristic of expected growth within the San Dieguito River and should be utilized for both the on- and off-site mitigation areas.

In order to determine if the goals of the revegetation program have been achieved, certain success criteria must be met. These criteria typically include quantified measures such as percent survival, percent cover by native species, and non-native cover. These data will be collected during annual monitoring events. Each annual monitoring report will evaluate if these criteria have been met and prescribe corrective measures if necessary.

By satisfying the performance standards, the mitigation areas indicate that they are establishing themselves as self-sustaining habitat. Moreover, mitigation sites are expected to sustain themselves for a minimum of two years (meeting the fifth-year performance standards) in the absence of significant maintenance measures for the final two years during the monitoring period. Performance standards for the coastal freshwater marsh and riparian scrub mitigation areas are included in Tables 8 and 9.

TABLE 8
PERFORMANCE STANDARDS FOR COASTAL FRESHWATER MARSH
(Absolute Cover)

Year	Native Cover*	Container Plant Survival	Non-native Coverage (not to exceed)
1	-	80%	20%
2	30%	100%**	10%
3	50%	100%**	5%
4	65%	-	5%
5	85%	-	5%

*This does not include areas of open water caused by slight variations in elevation.
**Relative percentage of Year 1.

TABLE 9
PERFORMANCE STANDARDS FOR RIPARIAN SCRUB
(Absolute Cover)

Year	Native Cover	Container Plant Survival	Non-native Coverage (not to exceed)
1	50%	80%	20%
2	50%	100%*	10%
3	50%	100%*	5%
4	65%	-	5%
5	85%	-	5%

*Relative percentage of Year 1.

 RECON

7.1.1 Light-footed Clapper Rail

A primary goal of the Plan is to improve the breeding and foraging habitat of the light-footed clapper rail. Performance standards for assessing whether these goals have been met will include a habitat component and a species-specific component. The habitat for the light-footed clapper rail will be evaluated based on vegetation performance standards, a habitat assessment of the created marsh and restored riparian corridor, and focused surveys. The vegetation performance standards for cover discussed above, particularly in terms of native and non-native vegetation cover, are useful parameters to evaluate the progress of the restoration effort and to evaluate that the quality of the habitat has been improved. These parameters also directly relate to the suitability of the habitat for light-footed clapper rail, as increased cover provides refugia from predators and vegetative cover for breeding and foraging.

In order to evaluate the benefits of the restoration effort for the light-footed clapper rail, focused surveys will be conducted. The surveys will help confirm whether individual birds are using the created marsh and what the relative use and distribution is of the birds within the restored areas. Specifically, the goal would be to document the use of newly created marsh habitat and the use of restored habitat in the disturbed channel and adjacent riparian corridor. No performance standards are included for bird number or population size.

7.2 Monitoring Methods

A qualified restoration biologist will conduct the restoration monitoring (the responsibilities and qualifications of the Project's restoration biologist are detailed in Section 5.3.1 of this report). This monitoring program is intended to provide continued oversight of the mitigation areas after installation is completed. The mitigation areas will be monitored through a combination of qualitative and quantitative means. Qualitative monitoring provides proactive direction and oversight of the maintenance program, and quantitative monitoring measures overall habitat development. This oversight will accomplish two objectives: 1) provide feedback for the maintenance contractor, and 2) provide information to evaluate progress so that recommendations can be made to help meet performance standards.

Initial monitoring will begin following a 120-day PEP. The as-built plantings will be compared to the planting specifications in this report (Tables 2–6), with any deviations from this plan included in an as-built report. Any significant deviations from this plan will be evaluated by the restoration biologist and, if necessary, changes made to conform to the plan.

Both qualitative and quantitative data will be collected during monitoring surveys. Qualitative monitoring will include observations of wildlife use on-site, general site conditions and plant health, identification of potential problems, and remediation alternatives. Quantitative information will include survivorship and native and non-native cover

7.2.1 Vegetation Measurements

Monitoring data will be analyzed for trends and changes in cover of the most common tree, shrub, and herbaceous species. Year-to-year changes in vegetative cover will be compared to determine whether the mitigation areas are approaching characteristics of mature vegetation. The performance standards described below for achieving success are attributable to percent cover and survivorship of native species and their relation to providing habitat for clapper rail.

7.2.1.1 Container Plant Survival

Survival of all container plant material shall be 80 percent in Year 1. Remedial planting shall occur to account for plant mortality to ensure that 90 percent of the plant palette survives in all vegetation communities. The only exception is willow and mule fat cuttings, which have reduced survival rates. Cuttings will be installed at sufficient numbers so that vegetative cover requirements will be met. Generally, a guideline of 60 percent survival or greater in Year 1 is a good measure that the cuttings were installed correctly and that the hydrology is suitable for cuttings. Should survival be less than 60 percent, all remedial planting should be through installation of container plants that can be irrigated.

7.2.1.2 Cover of Native Plants

As directed in the NES report for this project, monitoring data should be analyzed separately for cover of the herbaceous understory, shrub midstory, and tree overstory, as appropriate for each habitat type. Native cover performance standards for each mitigation area are included in Tables 10 through 12.

7.2.1.3 Cover of Non-Native and Invasive Plants

At the completion of Year 5, there shall be no perennial invasive plant species within the mitigation site (see Section 5.6.2 for a list of the targeted invasive plant species). Other non-native annual species shall not exceed 5 percent in Year 5. These values are absolute.

7.2.1.4 Diversity

Although there is no performance standard for native diversity, all plant species will be noted during monitoring visits. Native species diversity within the herbaceous understory, shrub midstory, and tree overstory will create habitat for a more diverse array of wildlife species.

7.2.2 Qualitative Monitoring Methodology

Evaluation of plant health and identifying and correcting problem areas is necessary for ensuring successful habitat establishment. In Year 1, qualitative monitoring will be conducted monthly, then quarterly for Years 2 through 5. The monitor will review the project areas to assess germination, survival, and growth of seeded and planted material, levels of weed competition, and erosion. The monitor will record and report findings and make recommendations for remedial actions, if needed, to the maintenance contractor after each monitoring event. If site conditions are such that additional remedial actions are required beyond those envisioned in this plan, the monitor will communicate recommendations for remediation to the project proponent.

A component of qualitative monitoring will be to determine the efficacy of invasive plant management/treatment methods, especially within the riparian scrub enhancement area due to high density of invasive species. Monitoring for invasive species will consist of site visits to determine the presence and location of invasive species as well as the percent cover and life stage. Monitoring will dictate whether remedial measures are required. Results will objectively determine if the treatment areas approach the goals specified at the beginning of treatment activities.

7.2.3 Quantitative Monitoring Methodology

Quantitative monitoring will measure the development of the vegetation within the mitigation areas and will provide documentation on whether the sites are meeting their performance standards. Quantitative monitoring will be performed within the mitigation areas once a year during the late spring to early summer to measure year-to-year changes on the sites. Late spring to early summer monitoring will allow winter deciduous trees such as willows time to leaf out and be monitored during their active growing season as well as coinciding with the period of maximum growth of marsh plants. Quantitative monitoring will begin the second spring following implementation of restoration activities in order to allow time for the new vegetation within the mitigation areas to become established.

Some plant species take significantly longer than five years to mature; therefore, full maturation of the mitigation areas will not be achieved by the end of the monitoring period. However, the monitoring data will be analyzed for trends and changes in cover of the most common tree, shrub, and herbaceous species. Year-to-year changes in vegetative cover will be compared to determine whether the mitigation areas are approaching characteristics of mature vegetation. Performance standards will be measured as absolute values. The following describes the various sampling methods proposed for each of the vegetation habitats.

7.2.3.1 Point-intercept Transect (Coastal freshwater marsh area)

The point-intercept transect monitoring method will quantitatively measure the freshwater marsh mitigation area. Transects will be positioned randomly throughout these areas, with two transects per acre. The monitoring methods will follow the protocol published by the California Native Plant Society (CNPS) in Sawyer and Keeler–Wolf's, *A Manual of California Vegetation*, revised in 2004 (CNPS 2004). This method uses a 50-meter point transect centered on a 50×5-meter plot. Using this method, vegetation is sampled by the point method at 0.5-meter intervals along the 50-meter transect to determine cover. The surveyor notes the species encountered and classifies their height (i.e., herb, shrub, or tree) at each interval. In addition, each shrub or perennial species growing in the 5×50-meter plot is counted to determine shrub density and diversity. All annuals present in the 5×50-meter plot shall also be noted. Survival will be measured by direct counts within the established belt transects.

7.2.3.2 Line-intercept Transect (Riparian scrub area)

The riparian scrub mitigation area will be quantitatively monitored using the line-intercept transect method. Quantitative sampling will be carried out during the late spring or early summer to ensure the best representation of species diversity. Quantitative monitoring should follow the line-intercept method described in Measuring & Monitoring Plant Populations (Elzinga et al. 1998). This method is a simple quantitative sampling technique where canopy cover is measured along a line intercept transect by noting the point along the tape where the canopy begins and the point at which it ends. When these intercepts are added and then divided by the total line length, the result is a percent cover for that species along the transect. For overhead vegetation, a pole with a level may be used. The line-intercept transect method is effective for species with dense canopies, such as riparian scrub habitats.

7.2.4 Photo-documentation

The mitigation effort will be qualitatively documented using photographic monitoring and general observations. Several permanent viewpoints for photo-documentation will be established in each of the different mitigation areas, including in association with the monitoring of the point-intercept and line-intercept transects. Photographs shall be taken each monitoring period from the same vantage point and in the same direction, and shall reflect information discussed in the monitoring report. These photos will be included in each annual report.

7.3 Monitoring Schedule

The monitoring period will be conducted by the restoration biologist, will begin with implementation of the mitigation work, and will last for five years or until the restored vegetation has met performance standards, whichever is shorter. Qualitative monitoring will be conducted monthly during the PEP (the 120 days following plant installation), and then quarterly for the remainder of Year 1. Qualitative monitoring will also be performed quarterly for Years 2 through 5. The monthly monitoring surveys conducted during the first four months will concentrate on qualitative observations to identify potential problems and recommend maintenance activities, where necessary. A monitoring schedule is presented in Table 10.

TABLE 10
APPROXIMATE MONITORING SCHEDULE

Description	PEP	Year 1	Year 2	Year 3	Year 4	Year 5
Qualitative						
Monitoring	Weekly	Monthly	Monthly	Bimonthly	Quarterly	Quarterly
Quantitative						
Spring Point-intercept Sampling	–	–	Annually	Annually	Annually	Annually
Spring Line-intercept Sampling	–	–	Annually	Annually	Annually	Annually

8.0 Reporting

8.1 As-built Report

Per the NES Report for the Project (TES 2006; ICF/Nordby Biological Consulting 2015) and Draft EIR, within 60 days of completion of site preparation and planting, a report shall be submitted describing the as-built status of the mitigation project. Topographic maps shall also be included with this report showing the as-built contours of the mitigation site as well as the locations of the plants. Changes from the original plans will be indicated in indelible red ink. Separate reports shall be submitted for grading, plant installation, and erosion control measures (if not implemented by the same contractor) and shall be included as attachments to the final as-built report submitted to the appropriate resource agencies.

8.2 Annual Monitoring Report

Annual monitoring reports will be submitted to the City and all other appropriate resource agencies for a period of five years or until final performance standards are achieved, whichever is shorter, beginning approximately one year after installation. These reports will discuss the qualitative and quantitative methods and results, the progress of the mitigation sites, and will include corrective measures that may facilitate the attainment of mitigation success as defined by the established performance standards (see Section 7.1). A review of the project by the resource agencies should occur within 45 days of receiving the report and remedial measures recommended, if necessary.

These reports will include the following:

- A list of names, titles, and companies of all persons who prepared the content of the annual report and participated in monitoring activities for that year;
- An analysis of all qualitative and quantitative monitoring data;
- A report of number of acres of exotic vegetation removed, treated, and retreated;
- Copies of monitoring photographs; and
- Maps identifying monitoring areas, planting zones, etc., as appropriate.

9.0 Overall Schedule

In order to coincide with optimal growing conditions, mitigation implementation and planting should occur from fall/early winter through the spring months (approximately October through February). Implementation of mitigation will be timed to occur following the construction of the El Camino Real Bridge/Road Widening Project. Mitigation work will begin with site preparation in approximately September, followed by planting and seeding starting the following January. Table 11 provides a general schedule of the implementation and monitoring activities.

The goals of the mitigation program to establish the desired species should be met within the five-year maintenance and monitoring period required for the mitigation site. However, it may take 15 years or more for some of the vegetation communities and individual species to reach full maturity and habitat value.

TABLE 11
CONCEPTUAL SCHEDULE FOR PROJECT

	Month											
Year	J	F	M	A	M	J	J	A	S	O	N	D
0									SP	SP/G	G	I
1	I	I	I									
2	S/R	S/LCRM	S/LCRM	LCRM	LCRM	LCRM						
3	R	LCRM	LCRM	LCRM	LCRM	LCRM						
4	R	LCRM	LCRM	LCRM	LCRM	LCRM						
5	R	LCRM	LCRM	LCRM	LCRM	LCRM						
6	RT											

SP = Site Preparation
G = Grading
I = Installation Phase
S = Seeding
LCRM = Light-footed Clapper Rail Monitoring
R = Annual report due
RT = Final report and termination of monitoring period for habitat restoration

10.0 Final Mitigation Success

If all performance standards are met at the end of any monitoring year, the mitigation will be considered a success. When the monitoring period is complete and final performance standards have been met, the Permittee will notify the resource agencies when submitting the final annual report that documents this completion.

10.1 Contingency Measures

The functions and values of a native and self-sustaining riparian ecosystem should be restored to the mitigation sites within a period of five years. There is enough native plant material adjacent to the mitigation site to provide an ample seed source for the natural recruitment of native species. Active restoration practices will be provided in areas where natural recruitment is slow to take effect, and this will speed the revegetation process. An intensive weed management program will eradicate invasive plants from the mitigation sites and allow native species to flourish.

Beginning in Year 2, if the site has not met its performance standards at the end of the annual maintenance and monitoring period for that year, the restoration biologist will meet with the project client and resource agencies to recommend remedial measures. Each annual report will contain a section that addresses remedial actions that should be taken in order to meet the project goals. If followed, these recommended contingency measures will ensure that the mitigation program is successful.

11.0 References Cited

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2000 Park Master Plan for the Coastal Area of the San Dieguito River Valley Regional Open Space Park. January.

Southern California Edison
2005 San Dieguito Wetlands Restoration Project. Final Restoration Plan. Submitted to California Coastal Commission. November.

Tierra Environmental Services
2006 Natural Environment Study Report for the El Camino Road/Bridge Widening Project. June 13.

U.S. Army Corps of Engineers (USACE)
2012 12501-SPD. Regulatory Program Standard Operating Procedure for Determination of Mitigation Ratios. Current Approved Version 11/30/12.

U.S. Fish and Wildlife Service (USFWS) and San Dieguito River Park Joint Powers Authority (JPA)
2000 Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project. August.

Appendix L
Resumes of Key Personnel

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NORDBY BIOLOGICAL CONSULTING

CHRIS S. NORDBY

Principal Biologist

Education

San Diego State University, Master of Science, Biology
University of Northern Colorado, Bachelor of Arts, Zoology (Chemistry Minor)
Western Michigan University, Continuing Education, Federal Wetland Policy

Professional Experience

2008-Present	Principal Biologist/Owner, Nordby Biological Consulting, Inc., San Diego, CA
1993-2008	Principal Biologist, Tierra Environmental Services, Inc., San Diego, California
1991-1993	Senior Project Scientist, Woodward - Clyde Consultants, San Diego, California
1990-1991	Senior Scientist, Science Application International Corporation, San Diego, California
1985-1990	Research Ecologist and Manager, Pacific Estuarine Research Laboratory (PERL), San Diego State University, San Diego, California
1984-1985	Senior Biologist, Mooney - Lettieri & Associates Environmental Consultants, San Diego, California
1982-1984	Wildlife Biologist, U.S. Fish & Wildlife Service, Ecological Services, Laguna Niguel, California
1980-1982	Sea Grant Trainee, San Diego State University, Biology Department, San Diego, California

Qualifications

Mr. Nordby has over thirty years of experience in the ecology of southern California wetlands, including development and implementation of wetland restoration plans, habitat requirements of wetland-associated endangered species, development and implementation of long-term monitoring programs and environmental permitting/compliance as required under the Clean Water Act, the Endangered Species Act, the Coastal Zone Management Act, and the Fish and Wildlife Coordination Act. He has worked as a research ecologist at the Pacific Estuarine Research Laboratory at San Diego State University; as a wildlife biologist for the U.S. Fish and Wildlife Service; and as a professional consultant. He is co-author of the *Ecology of Tijuana Estuary, California: An Estuarine Profile*, a detailed description of one of San Diego County's remaining coastal wetlands, and has worked in regional lagoons and estuaries from Bahia de San Quintin in Baja, Mexico to Goleta Slough in Santa Barbara County, California. A summary of relevant project experience includes:

SDG&E South Bay Substation Relocation Wetland Mitigation Project. SDG&E has proposed relocation of its existing South Bay Substation formerly associated with its recently demolished South Bay Power Plant located in the City of Chula Vista California. The site of the proposed relocation was determined to support approximately 2.5 acres of jurisdictional wetland habitat and in order to secure discretionary permits for the project restoration/creation of approximately 10 acres of coastal wetland habitat was required by the California Coastal Commission. Through a screening process that involved multiple potential restoration sites, D Street Fill, located within the boundaries of the

San Diego Bay National Wildlife Refuge managed by the U.S. Fish and Wildlife Service (USFWS) was selected as the site with the greatest potential to successfully fulfill SDG&E's mitigation requirements. Mr. Nordby is currently serving as Restoration Ecologist as a subconsultant to AECOM on development of a wetland restoration plan to provide compensatory mitigation for impacts associated with the substation relocation. His duties to date have included participation in the screening process for site selection; development of conceptual restoration plans for the D Street Fill site; coordination between SDG&E and the USFWS during concept development and site characterization surveys; coordination with the soils contamination analysis completed to document the potential for contaminants on-site; and, coordination with on-site biological and cultural resources investigation. Future tasks are anticipated to include development of the final mitigation plan; development of the long-term monitoring and maintenance plan; development of construction plans and specifications; construction management; and, participation in long-term monitoring of the project.

Poseidon Resources Marine Life Mitigation Plan, Otay River Estuary Restoration Project. Poseidon Resources has proposed construction of a seawater desalination plant on Aqua Hedionda Lagoon in Carlsbad. The Carlsbad Desalination Plant will use water that has been used by the Encina power plant for once-through cooling of its generators. Because the once-through cooling results in mortality to fish larvae, the California Coastal Commission has required Poseidon to mitigate for these impacts by creating or restoring 66.4 acres of intertidal estuarine wetlands. After consideration of 12 potential restoration sites located within the southern California Bight, the lower Otay River was selected and approved. The lower Otay River mitigation site is located on the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge and includes a portion of Pond 20 and former agricultural lands to the east of Pond 20. The U.S. Fish and Wildlife Service has agreed to partner with Poseidon to accomplish this restoration. Mr. Nordby is currently serving as the project Restoration Ecologist for Poseidon. His duties have included screening of the potential restoration sites resulting in the Otay River site, development of restoration concepts, permit support and coordination with the USFWS and the Coastal Commission. Five restoration alternatives have been developed and are under being considered by Coastal Commission staff and Scientific Advisory Panel **.**

South San Diego Bay Restoration Project, Western Salt Ponds Restoration. The South San Diego Bay Restoration Project is a comprehensive long-term restoration project planned for the south bay. A major component of the project is the restoration of three salt evaporation ponds located in the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge. This component will involve the conversion of approximately 230 acres of salt evaporation ponds – Ponds 10a, 10 and 11- (referred to as the western ponds) to intertidal wetlands habitats. The western ponds restoration is funded by two federal grants and one state grant and is administered by the non-profit Southwest Wetlands Interpretive Association.

Mr. Nordby served as Restoration Ecologist during the planning phase of the project and as Construction Manager during construction. His duties included development of construction plans and specifications, development of a planting plan for establishment of salt marsh and transitional habitats, development of a long-term monitoring plan to assess project success, and daily oversight of project contractors and subcontractors. Project construction was completed October 2011. Long-term monitoring will continue through 2016.

San Elijo Lagoon Restoration Project. The San Elijo Lagoon Restoration Plan is an ecosystem-wide restoration of the entire 690-acre lagoon located in northern San Diego County. Funded by the San Diego Association of Governments (SANDAG), the project seeks to reverse decades of degradation, including sedimentation, sewage treatment, diking for duck hunting, and constriction of tidal influence by road and railway bridges and abutments. Mr. Nordby is serving as Restoration Biologist for this on-going project in association with AECOM and Moffatt &

Nichol. His duties include: development and assessment of four restoration alternatives, including potential relocation of existing infrastructure and tidal inlet; coordination with stakeholders, including regulatory agency personnel; and assessment of predicted sea level rise for all restoration alternatives. This project is on-going and is scheduled for completion in 2016.

San Dieguito Lagoon Restoration Project. The San Dieguito Lagoon Restoration project is a feasibility study funded by SANDAG that seeks to restore a minimum of 50 acres of intertidal wetland in the eastern portion of the lagoon. Designed to complement the 115-acre restoration undertaken by Southern California Edison at San Dieguito Lagoon as mitigation for the San Onofre Nuclear Generating Station, this restoration plan is currently in the conceptual development phase. Future phases will take the project, if proven feasible in Phase I, to detailed engineering plans. Mr. Nordby serves as Restoration Biologist on the multi-disciplinary restoration team. His duties include: development of three restoration alternatives; coordination with stakeholders, including regulatory agency personnel; selection of a preferred alternative; assessment of existing biological resources to determine pre-project resources and impacts to those resources, if any; and development of preliminary engineering and design to estimate construction costs and sediment disposal alternatives.

Ballona Wetlands Restoration Project. The Ballona Wetlands Restoration Project addressed restoration of the last remaining wetland in Los Angeles County. The project included development of five alternatives for restoration of approximately 600 acres of degraded wetland habitat. Mr. Nordby served as Restoration Biologist for this project funded by the California Coastal Conservancy. Mr. Nordby's duties included the developing the biological components of a project feasibility and design report; developing criteria for assessing measures of change associated with each alternative relative to existing conditions; and developing a method of comparing each alternative involving selected target species. The feasibility study was completed January 2009.

Tijuana Estuary - Friendship Marsh Restoration Feasibility and Design Study. The Tijuana Estuary - Friendship Marsh Restoration Feasibility and Design Study is a multi-discipline study of the restoration of the southern arm of Tijuana Estuary, located in extreme southwestern San Diego County. The study, funded by the California State Coastal Conservancy and directed by Mr. Nordby, examines restoration alternatives for approximately 250 acres of degraded habitat. Project constraints analyses included the hydrology and sediment budget of the Tijuana River, coastal processes such as sea level rise and estuarine hydrology, existing biological resources, existing cultural resources, sediment characterization disposal options, and long-term monitoring plans for both physical and biological processes. Three project alternatives were developed and a preferred alternative identified. The feasibility report was completed August 2008.

San Elijo Lagoon Enhancement Study. Mr. Nordby served as Project Biologist on this study, funded by the City of Encinitas which addressed the feasibility of restoring San Elijo Lagoon in northern San Diego County. The project evaluated several alternatives that included realignment of Highway 1 through the project area; constructing various bridges for Highway 1 to cross the lagoon; removing the berm for the current railroad crossing of the lagoon and constructing a new crossing on a bridge; combining the Highway 1 and railroad bridge crossings of the lagoon; moving the channel inlet from its current position; and dredging portions of the lagoon. The project included costs associated with each alternative, potential impacts to sensitive habitats and sensitive species; changes in tidal prism associated with various dredging options; and the feasibility of permitting each alternative. The study was completed in 2001 and was used as the basis for a revised restoration analysis currently underway and funded by San Diego Association of Governments.

Tijuana Estuary Tidal Restoration Project, Model Marsh. The Model Marsh is a 20-acre intertidal salt marsh restoration project at Tijuana Estuary that was identified in the Tijuana Estuary Tidal Restoration Program EIR/EIS completed in 1991. Mr. Nordby served as the Project Biologist for this project, constructed in 1999-2000. His duties included project design, design and implementation of the sediment testing program, vegetation mapping, wetland delineation, permitting, endangered species surveys and consultations, agency coordination, construction management, and long-term vegetation monitoring. A census of the site by the USFWS in 2005 detected five pairs of the endangered light-footed clapper rail and vegetation monitoring was ceased to avoid impacting this species.

Wetland Restoration of the Napolitano Trust Property, 2001. Caltrans District 11 conducted this restoration of approximately 1.25 acres of former wetland filled adjacent to Tijuana Estuary in Imperial Beach, California. Mr. Nordby was retained by Caltrans to design the restoration project, oversee construction activities, and conduct a long-term monitoring and maintenance program for the site. Construction was initiated December 4, 1998 and was completed by February 15, 1999. The project received final sign-off from the permitting agencies in 2002.

ERIKA EIDSON
Biologist

Erika Eidson has more than eleven years of experience working in the environmental consulting industry. Her experience includes preparing biological technical reports; conducting nesting bird and raptor surveys; conducting rare plant surveys; mapping of native and exotic vegetation communities; monitoring construction activities in wetland and upland habitats; and collecting and analyzing qualitative and quantitative data for revegetation/ mitigation sites. She is permitted to conduct focused surveys and habitat assessments for Quino checkerspot butterfly (*Euphydryas editha quino*) and southwestern willow flycatcher (*Empidonax traillii extimus*), as well as least Bell's vireo (*Vireo bellii pusillus*), and burrowing owl (*Athene cunicularia*).

Years of Experience

- Professional start date: 11/2001
- ICF start date: 07/2008

Education

- BS, Ecology, Behavior, and Evolution, University of California, San Diego, 2002

Certifications

- USFWS Recovery Permit #TE-051236-0 for Southwestern willow flycatcher (*Empidonax traillii extimus*) and Quino checkerspot butterfly (*Euphydryas editha quino*), 2008-03/2015
- DFG Permit #SC-10052 Authorization to survey and locate southwestern willow flycatcher, California

Training

- Southern Sierra Research Station's Southwestern Willow Flycatcher Workshop, May 2013
- San Diego County Sensitive Butterfly Workshop, December 2008 and 2010
- San Diego Plant Family Forum-Amaranthaceae-The Amaranth Family in San Diego County, San Diego Natural History Museum, San Diego, California, February 2009
- San Diego Plant Family Forum-Lamiaceae-The Mint Family in San Diego County, San Diego Natural History Museum, San Diego, California, March 2009
- Wetland Regulations, Lorman Education Services, January 2009

Project Experience

Parks, Trails, and Open Space

Mission Trails Regional Park Presence/Absence Surveys for Quino Checkerspot Butterfly—San Diego County Water Authority, California

Served as permitted surveyor. Duties included presence/absence surveys for the Quino checkerspot butterfly and least Bell's vireo. The San Diego County Water Authority proposed the Mission Trails Flow Regulatory II, Pipeline and Vend Demolition Project.

Task 6 San Diego River Multi-Use Bicycle and Pedestrian Path Biological and Cultural Surveys—City of San Diego Water and Wastewater Division, California

Served as field surveyor and author. Duties included performing a general biological survey, vegetation mapping, mapping sensitive plant species, and writing a biological technical report and an NES (minimal impact) involving potential impacts to wetland habitats. Duties also included preparing a conceptual mitigation plan for impacts to mule-fat scrub and addressing comments from the City of San Diego on the report.

Military

Quino Butterfly Surveys at Camp Monsoor—U.S. Navy, San Diego, California

Served as permitted surveyor. Duties included providing support for Quino checkerspot butterfly focused surveys.

Camp Morena Biological Surveys—U.S. Navy, San Diego, California

Served as field surveyor. Duties included performing spring and summer rare plant surveys and providing support for Quino checkerspot butterfly focused surveys.

Water

Alvarado Trunk Sewer Phase 3 Revised Biology, Wetlands, and Revegetation—City of San Diego Water and Wastewater Facilities Division, California

Served as field surveyor and author. Duties included performing a general biological survey, vegetation mapping, mapping sensitive plant species, and writing a biological technical report involving potential impacts to wetland habitats. Duties also included addressing comments from the City of San Diego on the report.

Regional Access Road Site Plan—Otay Water District, San Diego County, California

Served as field surveyor and author. Duties included mapping vegetation communities, mapping sensitive species, conducting Quino checkerspot butterfly protocol surveys, and preparing a constraints analysis.

Creekside Slope Protection—RICK Engineering, Riverside, California

Served as field surveyor. Duties consisted of conducting least Bell's vireo presence/absence surveys within the impact area and a 100-foot-wide buffer. A report presenting survey results was also prepared.

Transportation—Roads, Bridges, and Highways

SR 39 North Fork San Gabriel River Bridge Replacement Project—Caltrans, Los Angeles County, California

Served as permitted surveyor and author. Duties consisted of conducting least Bell's vireo and southwestern willow flycatcher presence/absence surveys within the impact area and a 250-foot-wide buffer. A report presenting survey results was also prepared.

Otay Mesa Road Widening Biological Surveys and Report—County of San Diego Department of Public Works, Chula Vista, California

Served as field surveyor and author. Duties included preparing a constraints analysis, mapping vegetation communities, assessing potential for sensitive species, providing support for burrowing owl presence absence surveys, and conducting Quino checkerspot butterfly protocol surveys.

El Camino Real Road and Bridge Widening Biological Surveys—City of San Diego Water and Sewer Division, California

Served as field surveyor and author. Duties included preparing an NES, mapping vegetation communities, assessing impact areas, conducting rare plant surveys, and providing support for least Bell's vireo presence/absence surveys.

I-15 Widening from San Bernardino to I-215 EIR/EIS—Riverside County Transportation Commission/HDR Engineering, California

Served as permitted surveyor. Provided support with focused surveys for least Bell's vireo, southwestern willow flycatcher, and burrowing owl along the project alignment.

Willow Street Bridge—City of Chula Vista, California

Served as field surveyor. While employed with Tierra Environmental Services, conducted a reconnaissance survey, mapped vegetation communities, monitored soil boring activities, conducted a sensitive plant survey, and conducted presence/absence surveys for least Bell's vireo. The City of Chula Vista has proposed the widening of the Willow Street Bridge, which crosses over the Sweetwater River in the unincorporated community of Bonita.

Borden Road Bridge Project—City of San Marcos, California

Served as field surveyor. While employed with Tierra Environmental Services, conducted a reconnaissance survey, mapped vegetation communities, assisted with a wetland delineation, and conducted least Bell's vireo presence/absence surveys along areas proposed for vegetation removal and within 500 feet of the project boundary.

Energy

Sunrise Powerlink Biological Resources—SDG&E, San Diego County, California

Served as field surveyor. Assisted with wetland delineations.

Tehachapi Renewable Transmission Project (TRTP) Biological Consulting Services—SCE, San Diego, California

Serves as permitted surveyor. Duties included conducting habitat assessments for sensitive status species, including burrowing owl, least Bell's vireo, and southwestern willow flycatcher. Providing support for focused surveys for least Bell's vireo and southwestern willow flycatcher.

TRTP Regulatory Compliance—SCE, Los Angeles, Kern, and Riverside Counties, California

Served as monitor. Monitored least Bell's vireo activity and behavior during construction activities within 500 feet of occupied habitat. Completed daily monitoring logs for the project.

Sunrise Powerlink Wetlands and Waters Delineations—SDG&E, San Diego, California

Served as field surveyor. Duties consisted of assisting with field work during wetland delineations.

Conservation Planning

Desert Renewable Energy Conservation Plan—CEC/Aspen Environmental Group, California

Served as author. Prepared species accounts for southwestern willow flycatcher and Parish's alkali grass to be included in the Desert Renewable Energy Conservation Plan.

Schools

Palomar College North Education Center—Palomar College District, Fallbrook, California

Served as field surveyor. While employed with Tierra Environmental Services. The Palomar College District proposed the construction of a North County campus in Fallbrook. Duties included conducting a reconnaissance survey, mapping vegetation communities, conducting presence/absence surveys for least Bell's vireo, and focused surveys for sensitive plants.

Restoration

Maintenance and Management of the San Miguel Habitat Management Area—Otay Water District, Spring Valley, California

Served as field surveyor. Provided support for annual investigation of the revegetation areas at the Otay Habitat Management Area. Duties included surveying artificial burrows for burrowing owls, conducting focused surveys for Quino checkerspot butterfly, and providing support for focused surveys for least Bell's vireo.

San Pasqual Streambed Restoration Project—Private Client, San Diego County, California

Served as field surveyor. While employed with Tierra Environmental Services, duties consisted of conducting least Bell's vireo presence/absence surveys along areas proposed for vegetation removal and within 500 feet of the project boundary. A streambed enhancement project was proposed in San Pasqual Valley including approximately 2.3 miles of sediment-chocked streambed from "The Narrows" in the San Dieguito River to within one mile of the SR 78 Bridge over Santa Ysabel Creek.

Employment History

ICF International. Biologist. San Diego, California. 07/2008–Present.

URS Corporation. Biologist. San Diego, California. 04/2008–07/2008.

Tierra Environmental Services. Biologist. San Diego, California. 11/2001–04/2008.

KYLIE FISCHER

Wildlife Biologist

Kylie is a senior biologist at ICF who has been working in southern California with local fauna and flora for 18 years. She specifically has 18 years of experience studying California gnatcatchers, with more than 7,000 hours of field experience, including supervisory roles in several extensive, long-term gnatcatcher studies on Marine Corps Air Station Miramar that encompassed surveying during the breeding and non-breeding season, nest monitoring, territory mapping, and color marking. She has conducted numerous protocol surveys for the coastal California gnatcatcher throughout their range in San Diego, Riverside, Orange, and San Bernardino Counties. Kylie has 11 years of experience conducting surveys and territory mapping for least Bell's vireo. Kylie has participated in bird banding in San Diego, Riverside, and San Bernardino Counties for ten years. In addition, she is experienced in vegetation mapping and general vertebrate surveys in San Diego, Riverside, Orange, and San Bernardino Counties.

Project Experience

Military

Naval Weapons Station Seal Beach Detachment Fallbrook Least Bell's Vireo Surveys—U.S. Navy, San Diego County, California

Project Manager and Lead Biologist. Conducted focused surveys and nest monitoring for least Bell's vireo along nine drainages (approximately 8 miles). Performed all field work, report writing and administrative tasks in 2010 and 2011. Project is funded for 2012.

Naval Weapons Station Seal Beach Detachment Fallbrook California Gnatcatcher Surveys—U.S. Navy, San Diego County, California

Project Manager and Lead Biologist. Conducted focused surveys for California gnatcatchers within 14 previously defined polygons (1,400 acres). Performed all field work, report writing, and administrative tasks in 2010 and 2011. Project is funded for 2012.

Years of Experience

- Professional start date: 02/1994
- ICF start date: 01/2005

Education

- BA, Psychology (minor in Ecology), San Diego State University, 1993

Certifications

- USFWS Permit (TE-039321) — Authorization to survey, locate and monitor nests of the threatened coastal California gnatcatcher (*Polioptila californica californica*) and the endangered least Bell's vireo (*Vireo bellii pusillus*), Expires 04/2012
- CDFG Authorization to survey, locate and monitor nests of the coastal California gnatcatcher (*Polioptila californica californica*) and least Bell's vireo (*Vireo bellii pusillus*), Expires 09/2012
- CDFG Permit (SC-006068) — Authorization to capture for study by means of pitfall traps, live traps or other methods reptiles, amphibians, and mammals in San Diego, Orange, Riverside, San Bernardino, and Imperial Counties. Authorization to PIT-tag chuckwalla (*Sauromalus ater*), 12/2010–12/2012

Training

- Passerine Banding, Barbara Carlson, Riverside, California, 1995
- Hummingbird Banding, Barbara Carlson, Riverside, California, June 2000Hummingbird Banding, Barbara Carlson, Riverside, California, 2000

Naval Weapons Station Seal Beach Detachment Fallbrook Fallbrook California Gnatcatcher Construction Monitoring—U.S. Navy, San Diego County, California

Project Manager and Lead Biologist. Conducted pre-construction surveys for California gnatcatcher and monitored the birds during project implementation. Performed field work, report writing and administrative tasks.

Remote Training Site Warner Springs Quino Checkerspot Butterfly Surveys—U.S. Navy, Warner Springs, California

Project Manager. Provided project management assistance to four surveyors and assisted with report writing for a project focused on determining the presence/absence of Quino Checkerspot butterfly at Remote Training Site Warner Springs.

Camp Michael Monsoor Quino Checkerspot Butterfly Surveys— U.S. Navy, San Diego, California

Project Manager. Provided project management assistance to four surveyors and assisted with report writing for a project focused on determining the presence/absence of Quino Ceckerspot butterfly at Camp Michael Monsoor.

Marine Corps Air Station Miramar Jet Fuel Underground Storage Tank Replacement Biological Monitoring—U.S. Navy, San Diego, California

Project Manager and Lead Biologist. Serves as the biological monitor for construction of above-ground jet fuel tanks and duties include nest monitoring a pair of coastal California gnatcatchers that occur adjacent to the project and report preparation.

Transportation—Roads, Bridges, and Highways

I-15 Widening from San Bernardino to I-215 EIR/EIS—Riverside County Transportation Commission/HDR Engineering, Riverside County, California

Lead Biologist. Conducted focused least Bell's vireo surveys in all suitable habitat from the intersection of I-15 and I-215 in southern Riverside County to the northern boundary of the County.

SR-94 Widening and Realignment Study—County of San Diego Department of Public Works (DPW), San Diego County, California

Lead Biologist. Providing support of the investigation into widening and realigning the highway for a 22-mile stretch of the highway. Services have included least Bell's vireo and California gnatcatcher surveys, coordination of the Southwestern willow flycatcher surveys, and preparation of a NES.

Laguna Canyon Road Wetland Mitigation Construction Monitoring—Orange County Resources and Development Management Department, Orange County, California

Lead Biologist. Duties included conducting surveys for least Bell's vireo and nesting birds for a two-mile long revegetation project.

Aldine Drive—Private Client, San Diego, California

Project Manager and Lead Biologist. Duties included conducting California gnatcatcher surveys and preparing a focused survey report.

Black Canyon Road Bridge—County of San Diego Department of Public Works (DPW), Ramona, San Diego County, California

Biologist. Conducting focused surveys for the least Bell's vireo and coastal California gnatcatcher for a bridge replacement project.

Willows Road Bridge—County of San Diego Department of Public Works (DPW), Alpine, San Diego County, California

Biologist. Conducted two years of focused surveys for the least Bell's vireo for a bridge project.

Parks, Trails, and Open Space

San Miguel Habitat Management Area—Otay Water District, Chula Vista, San Diego County, California

Biologist. Conducted focused surveys for the least Bell's vireo and California gnatcatchers for this multi-year project focused on managing the Otay Water District's mitigation property.

Water

Otay Mesa Recycled Water System CIP EIR—Otay Water District, Chula Vista, San Diego County, California

Project Manager. Conducted focused costal California gnatcatcher surveys, general wildlife surveys, and prepared the Biological Assessment for this pipeline.

Otay Water Treatment Plant Upgrade Pre-construction Nesting Bird Surveys, City of San Diego—San Diego, California

Project Manager and Lead Biologist. Conducted nesting bird surveys in 2009 and 2010 as needed and provided additional construction monitoring support as needed.

I-15 Widening/Second Aqueduct Relining Monitoring—San Diego County Water Authority (SDCWA), San Diego, California

Biologist. Conducted coastal California gnatcatcher monitoring during construction.

Otay II Pipeline Improvements—City of San Diego Water Department, San Diego, California

Biologist. Conducted focused surveys for California gnatcatcher and prepared a survey report for a 19-mile water pipeline project in the City of San Diego. Also conducted biological monitoring of construction work performed along this pipeline route.

Energy

Sunrise Powerlink 2007 California Gnatcatcher Surveys—San Diego Gas & Electric (SDG&E), San Diego, California

Project Manager for the coastal California gnatcatcher a surveys for the preferred northern alignment. Duties included general project management, conducting focused surveys, coordinating the schedule for the work crews, and preparing the reports.

Sunrise Powerlink 2007 Least Bell's Vireo Surveys—San Diego Gas & Electric (SDG&E), San Diego, California

Project Manager for the least Bell's vireo surveys for the preferred northern alignment. Duties included general project management, conducting focused surveys, coordinating the schedule for the work crews, and preparing the reports.

Development Projects

Tabata Tentative Parcel Map, San Luis Rey River—Private Client, Bonsall, San Diego County, California

Biologist. Duties included conducting least Bell's vireo surveys and preparing the San Diego County Biological Technical Report.

Coastal California Gnatcatcher Nesting Activity within and Adjacent to the Belmont Village Senior Housing Development Project Area—Tierra Environmental Services, Encinitas, California

Project Manager and Lead Biologist. Duties included conducting California gnatcatcher surveys to determine nesting status during construction and preparing letter reports for the USFWS.

Canyon View Estates—National City, SD County, California

Biologist. Conducted focused surveys for the California Gnatcatcher and pre-construction surveys for nesting birds.

Schools

Grossmont New High School #12—Essentia Management Services/Grossmont Union High School District, Alpine, San Diego County, California

Biologist. Conducted least Bell's vireo surveys and prepared the Biological Technical Report for a project to develop a high school in Alpine.

Palomar College North Education Center—Fallbrook, San Diego County, California

Project Manager and Lead Biologist. Duties included conducting California gnatcatcher surveys and preparing a focused survey report.

Mines and Quarries

Rosemary's Mountain Quarry—Granite Construction, Fallbrook, San Diego County, California

Biologist. Assisting with agency consultation and permitting for construction of a rock quarry near Fallbrook. The project is located along SR-76 and the San Luis Rey River and requires re-aligning and widening a 1.25-mile segment of the highway. Performed focused surveys for California gnatcatcher and least Bell's vireo. Performs surveys at potential mitigation sites to determine if the required resources are located onsite.

Landfills

Otay Landfill—County of San Diego Department of Public Works (DPW), Chula Vista, California

Biologist. Conducted focused surveys for the California Gnatcatcher in an area of expansion for the Otay landfill.

Employment History

ICF International. Wildlife Biologist. San Diego, California. 01/2005–Present.

Varanus Biological Services, Inc. Wildlife Biologist. San Diego, California. 01/2001–01/2005.

Cambell BioConsulting. Bird Bander. Temecula, California. March/1999–August/2002.

Hubbs-Sea World Research Institute and San Diego State University. Wildlife Biologist. San Diego, California. 01/1994–01/2001.

DALE RITENOUR

Senior Biologist

Dale Ritenour has 15 years of experience in wetland delineation, habitat restoration, botanical and wildlife surveys, and research. He has conducted numerous survey and restoration projects within the City of San Diego, and is familiar with the City Biology Guidelines.

Dale regularly conducts wetland delineations on small to large sites including atypical situations, pursuant to USACE and CDFW guidance. He is familiar with recent regulatory guidance from the USACE.

He has extensive experience with the design, planning, implementation, and monitoring of wetland and upland restoration sites throughout southern California. Restoration projects range from 5-acre riparian corridors to a complex of 80 vernal pools. Dale has managed restoration projects focused on creating pool habitat for San Diego and Riverside fairy shrimp, installing and monitoring artificial burrows for burrowing owls, and establishing habitat for least Bell's vireo.

Field survey responsibilities have included vegetation mapping; general and focused sensitive plant, mammal, avian, reptile, amphibian, butterfly, and freshwater invertebrate species surveys; habitat assessments; and evaluation of impacts to sensitive species. He has conduced surveys for least Bell's vireo on over a dozen sites throughout San Diego County.

Selected Project Experience

Sunrise Powerlink and LEAPS Extension—CPUC and SDG&E, San Diego County, California

Served as biologist. Conducted biological surveys along portions of eight alternative alignments for Sunrise Powerlink. Surveys included vegetation mapping and focused surveys for least Bell's vireo, arroyo toad, burrowing owl, fairy shrimp, Quino checkerspot butterfly, and rare plants. Conducted baseline stream bioassessments and biological monitoring during construction.

High Desert Corridor—Caltrans, Antelope Valley, California

Served as lead biologist. Oversaw a team of biologists conducting rare plant surveys and a jurisdictional delineation along this proposed road widening project. Prepared the

Years of Experience

- Professional start date: 03/1998
- ICF start date: 02/2011

Education

- BS, Biology (Emphasis in Ecology) *cum laude*, San Diego State University, 1998

Certifications

- Wetland Delineation Certificate
- USFWS Endangered Species Recovery Permit TE-58888A-0 (wet and dry season fairy shrimp, and Quino checkerspot butterfly presence/absence surveys)
- Wildlife Track and Sign Level III (CyberTracker Conservation)

Selected Training

- Instructor – Riparian Flora Identification, Wetland Training Institute (WTI)
- Instructor - Vernal Pool Flora and Habitat Restoration, WTI
- California Rapid Assesment Method (CRAM) Riverine and Depressional Modules
- Basic Wetland Delineation, WTI
- Arid West Regional Supplement, Wetland Training Institute
- Botanical Families Workshop Series, 14-courses, San Diego Natural History Museum (SDNHM)
- Sedges and Rushes Identification, Louisiana State University Herbarium
- Oaks of San Diego County Identification Workshop, SDNHM
- Southwestern Willow Flycatcher Survey Techniques, Southern Sierra Research Station, CA

Selected Training Cont.

- Raptor Identification Workshop by Willam Clark, Sea and Sage Audubon
- Birds of Anza-Borrego Desert, UC Riverside Extension
- Advanced Bird Banding, Audubon Starr Ranch
- Introduction to Bird Banding, UC Riverside Extension
- San Diego Sensitive Butterfly Workshops, 2003&2012
- Anostracata of California, Oregon, and Washington, EcoAnalysts, Inc.
- Fairy Shrimp Identification, Dr. Denton Belk,
- SWPPP Compliance Workshop, City of San Diego
- Wilderness First Responder, Wilderness Medical Associates

Professional Memberships

- California Native Plant Society
- Society for Ecological Restoration
- Society of Wetland Scientists
- Western Field Ornithologists

preliminary jurisdictional delineation.

Lawson Valley Road Bridge West Bioassessment for Geotechnical Boring—County of San Diego Department of Public Works, Jamul, California

Served as biologist. Conducted a Jurisdictional Delineation, vegetation mapping and general site survey, and prepared a Caltrans NES (minimal impact).

Wetland Credit Assessment at Manchester—San Diego County Water Authority, Encinitas, California

Served as biologist. Conducted a Jurisdictional Delineation and vegetation mapping for this 10-acre site adjacent to San Elijo Lagoon.

Montgomery Field Runway Extension Project Vernal Pool Restoration—City of San Diego, California

Served as project manager and lead biologist. Responsible for the planning, implementation, and monitoring of the vernal pool restoration. Conducted all mitigation site baseline surveys and prepared the restoration plan for 25 pools with 1.03 acres of pool area and 4.9 acres of watershed. Directed the restoration and enhancement of vernal pools and surrounding uplands. Conducted wet season fairy shrimp surveys, maintenance and annual monitoring. Prepared annual monitoring reports.

Ocotillo Express Wind Energy Project—Pattern Energy, Imperial County, California

Served as biologist for a proposed 15,000-acre wind energy project located in the Colorado Desert near the town of Ocotillo in Imperial County. Conducted vegetation mapping, general wildlife and botanical surveys, jurisdictional delineations, avian point counts, avian migration counts, habitat assessments for listed and sensitive species, and focused surveys for rare plants, burrowing owls, flat-tailed horned lizards, and barefoot banded geckos.

Rolling Hills Ranch—McMillin Land Development, Chula Vista, San Diego County, California

Conducted construction monitoring for a 300-acre residential development in Chula Vista. Conducted biological monitoring of the additional 214-acre open space. Managed a translocation project for Otay tarplant (*Deinandra conjugens*). Conducted surveys for burrowing owl, least Bell's vireo, and California gnatcatcher.

Bachmann and Handler Properties—Bachmann Family Trust, San Diego, California

Served as lead biologist. Mapped vernal pools and conducted two years of fairy shrimp surveys for 60-acres in Otay Mesa. Mapped rare plants. Conducted surveys for Quino checkerspot butterfly and burrowing owl.

Vernal Pool Inventory—City of San Diego, California

Served as biologist. Assisted with vernal pool site visits and preformed data management tasks for the City vernal pool inventory.

ERIN SCHORR

Senior Biologist

Erin Schorr has 13 years of experience in preparing a variety of biological reports in conformance with CEQA, NEPA, and local jurisdiction guidelines. She has conducted general biological surveys, wetland delineations, and focused surveys for sensitive species and has worked on public works projects and native habitat restoration/creation projects throughout San Diego County. Erin specializes in managing on-call environmental projects for public agencies. She also has extensive experience managing small- and large-scale projects involving impacts to sensitive biological resources that require coordination with numerous local, state, and federal agencies. Erin has earned acceptance to the County of San Diego Department of Planning and Land Use's approved consultants list for biologists, and she is also certified to conduct wetland delineations per the Corps 1987 *Wetlands Delineation Manual*. She provides general biological surveys, wetland delineations, and focused surveys for sensitive species and native habitat restoration/creation projects throughout San Diego County.

Project Experience

Parks, Trails, and Open Space

San Miguel Habitat Management Area—Otay Water District, Spring Valley, California

Served as project director. Managed biological services for the ongoing maintenance and management of a 230-acre preserve in Spring Valley. Services included general maintenance and management; coordination with the resource agencies; revegetation/habitat restoration; rare plant surveys; Quino checkerspot butterfly, least Bell's vireo, and coastal California gnatcatcher surveys; burrowing owl habitat restoration; and invasive species removal.

Hazard Center Bike Path Project—City of San Diego Water and Wastewater Facilities Division, California

Served as project manager/senior biologist. Managed biological services for a proposed bike path. Issues included cultural resources and biological resources, including impacts to sensitive vegetation communities.

Years of Experience

- Professional start date: 09/1998
- ICF start date: 09/1998

Education

- BA, Biology, Southwestern University, Georgetown, Texas, 1997

Professional Memberships

- Association of Environmental Professionals
- Women's Transportation Seminar

Certifications/Licenses

- CEQA Approved Consultants List for Biologists, County of San Diego DPLU
- Certified Wetland Delineator, Corps 1987 *Wetlands Delineation Manual*
- USFWS Endangered Species Act 10(a)(1)(A) Recovery Permit for the Coastal California Gnatcatcher (TE-014806-2)

Special Training

- Fairy Shrimp Identification Training
- Endangered Species: Regulation, Planning, and Permits for Development
- Construction Safety Management and Regulatory Compliance Training
- Widget Training, San Diego Gas & Electric
- Project Management Training, ICF International

Plaza Bonita Bike Path Project—County of San Diego Department of Public Works, Chula Vista, California

Served as project manager and senior biologist. Managed environmental services for a project involving construction of a bike/pedestrian/equestrian trail in the City of Chula Vista and the County of San Diego. Services include general biological surveys/vegetation mapping, wetland delineation, rare plant surveys, focused surveys for the light-footed clapper rail and least Bell's vireo, preparation of a biological resources technical report, coordination with the City of Chula Vista, preconstruction surveys, and construction monitoring.

San Luis Rey Riverpark—County of San Diego Department of Parks and Recreation, California

Served as senior biologist. Managed biological services for the proposed San Luis Rey Riverpark Master Plan project. Services included attending public meetings, compiling and field checking biological data, and preparing a biological opportunities and constraints report, which assisted in the development of the master plan. Issues included the presence of the arroyo toad, coastal California gnatcatcher, least Bell's vireo, and southwestern willow flycatcher and their proposed/designated critical habitat; wetlands and other waters; giant reed removal opportunities; wetland creation/enhancement opportunities; and permit requirements. The San Luis Rey Riverpark Master Plan opportunities and constraints report was given the Outstanding Environmental Resource Document award by the Association of Environmental Professionals.

Post-Fire Quino Surveys—USFWS, Jamul, California

Served as senior biologist. Conducted a post-fire Quino checkerspot survey effort for the USFWS during the 2004 flight season. The goal of the study was to document the status of a Quino population previously documented by Mooney & Associates during the 2003 flight season. Several previously undiscovered Quino populations were documented.

Guajome Park Wetland Delineation—County of San Diego Department of Public Works, California

Served as project manager/senior biologist. Managed biological services for the proposed expansion of Guajome Park. Services included a formal wetland delineation, vegetation mapping, and preparation of a feasibility assessment/constraints analysis.

Morelli Park Improvement Project—City of Stockton, San Joaquin County, California

Served as biologist. Assisted in the preparation of an NES per Caltrans guidelines. Issues included impacts to the jurisdictional waters, nesting raptors and migratory birds, and potential impacts to sensitive fish species, including Delta smelt, Central Valley steelhead, and two seasonal "runs" of chinook salmon.

Water

On-Call Emergency Services—City of San Diego, California

Served as project manager. Managed an on-call emergency services contract which involved providing on-call biological services for emergency repairs related to pipeline breaks within the City of San Diego.

On-Call Environmental Services—City of San Diego Water Department, California

Served as project manager. Tasks included coordination with the City regarding specific proposed projects, attending site meetings, conducting biological surveys, preparing environmental documents, and coordinating with the resource agencies.

On-Call Environmental Services—City of San Diego Water and Wastewater Facilities Division, California

Served as project manager. Tasks included coordination with the City regarding specific proposed project, attending site meetings, preparing environmental documents, and coordinating with the resource agencies.

Mission Canyon Sewer B Biological Surveys—City of San Diego Water and Wastewater Facilities Division, California

Served as project manager and senior biologist. Managed biological services for a proposed sewer pipeline project. Services included preparation of a biological resources report, a mitigation plan, and permit applications for impacts to jurisdictional waters.

Force Main A/V Valves and Road Improvements Project—Otay Water District, Spring Valley, California

Served as project manager and senior biologist. Managed environmental services for a valve replacement and access road improvement project along an existing pipeline. Tasks included general project management, coordination with the resources agencies, and preparation of a low-effect HCP for incidental take of the Quino checkerspot butterfly and the coastal California gnatcatcher.

Emergency Storage Project Upland Mitigation Project—San Diego County Water Authority, California

As adjunct staff, managed environmental services associated with the upland mitigation required for the emergency storage project. Services included coordination with the County of San Diego, City of San Diego, and City of Oceanside staff regarding preparation of habitat management plans and coordination with DFG and USFWS regarding the approval of these plans.

North Mission Valley Interceptor Sewer—City of San Diego, California

Served as project manager and biologist. Managed biological services for a wetland revegetation project. Biological services included botanical monitoring, horticultural monitoring, general plant and wildlife surveys, site maintenance, eradication of giant reed, collection of quantitative data, and preparation of annual reports for submittal to City staff and the resource agencies.

Otay II Pipeline—City of San Diego Water Department, California

Served as biologist. Conducted biological surveys along 19 miles of an existing water pipeline. Sensitive species identified during the surveys included the coastal California gnatcatcher, yellow warbler, burrowing owl, California horned lark, Vaux's swift, southern California rufous-crowned sparrow, Cooper's hawk, San Diego black-tailed jackrabbit, red diamond rattlesnake, San Diego marsh elder, San Diego barrel cactus, Pacific saltbush, Otay tarplant, snake cholla, Palmer's grappling hook, and southwestern spiny rush.

Los Peñasquitos Canyon Preserve—City of San Diego Metropolitan Wastewater Department, California

Served as biologist. Monitored the implementation of a wetland and oak woodland restoration plan to satisfy mitigation requirements for various maintenance and repair projects performed by the City of San Diego Metropolitan Wastewater Department (MWWD). Supervised a riparian enhancement program involving the removal of mature eucalyptus trees from the Los Peñasquitos Creek corridor. Conducted general nesting bird surveys and focused surveys for the federally listed least Bell’s vireo. Supervised an oak woodland revegetation plan involving the installation of oak trees and native understory species. Conducted monitoring of the site during the 120-day plant establishment period, performed plant mortality counts, and prepared observation forms and reports to be submitted to the regulatory agencies.

Peñasquitos Reservoir—City of San Diego Water Department, California

Served as biologist. Conducted biological surveys, which included general plant and wildlife surveys and vegetation mapping for a reservoir rehabilitation project. Prepared biological resources technical report in conformance with City guidelines. Coordinated with City staff and subcontractors regarding implementation of a restoration plan and mitigation monitoring program for impacts to coastal sage scrub.

Olivenhain Water Storage Project—Olivenhain Municipal Water District, Encinitas, California

Served as biologist. Provided biological mitigation services for a water storage project, which included construction monitoring and revegetation implementation. Implemented a weed eradication program and maintenance and monitoring plan, which included success criteria to ensure the long-term viability of the revegetation site. Prepared annual reports to be submitted to the Olivenhain Municipal Water District, Corps, and DFG. Assisted with surveys for federally listed (threatened) coastal California gnatcatcher and general avifaunal surveys.

Point Loma Berm Revegetation Site—City of San Diego MWWD, Point Loma, California

Served as biologist. Provided biological monitoring of a revegetation site involving revegetation with maritime sage scrub on a 100-foot high berm that was created as a visual screen for Digesters 7 and 8 upgrades at the Point Loma Treatment Plant. Tasks included general avifaunal surveys, conducting quarterly monitoring visits to evaluate site success and coordinate maintenance, collecting annual transect data to quantify site success, preparing annual mitigation monitoring reports to be submitted to the jurisdictional agencies, and coordinating final sign-off of the site by MWWD staff.

Regional General Permit 53 Renewal Project—County of San Diego Department of Public Works, California

As adjunct staff, managed environmental services associated with the renewal of the County of San Diego's Regional General Permit 53, which allows for ongoing maintenance of drainages and flood control channels. Coordinated and attended meetings with the County Department of Public Works, Corps, DFG, and RWQCB/State Water Board staff. Services included the preparation of permit applications, a wetland delineation, an MND, and a BA.

Institutional Facilities

San Miguel Regional Firefighter Training Facility Project—Otay Water District, Spring Valley, California

Served as project manager and senior biologist. Managed biological services for a proposed regional training facility. Potential issues included Quino checkerspot butterfly and coastal California gnatcatcher. This project also involved coordination with the County of San Diego.

Development Projects

Oak Rose Subdivision—Private Client, San Diego County, California

Served as biologist. Managed biological services for a residential subdivision. Services include general biological surveys and report; vegetation mapping; a habitat assessment for the Quino checkerspot butterfly; a resource protection ordinance wetland assessment; and focused surveys for wart-stemmed ceanothus, summer holly, and San Diego sagewort.

Mt. Woodson—The Woodson Group, Ramona, California

Served as project manager and senior biologist. Managed biological services for a proposed residential subdivision west of SR 67 near the community of Ramona. Biological services include general biological surveys and report, focused surveys for sensitive wildlife species including arroyo toad (habitat assessment) and California gnatcatcher, a formal wetland delineation, spring rare plant surveys, vegetation mapping, and negotiating with the County of San Diego and the resource agencies.

Otay Southview—Private Client, Chula Vista, California

Serves as project manager and senior biologist. Managing biological services for a proposed residential development in Otay Mesa. Services include general biological surveys and report; vegetation mapping; spring rare plant surveys; a wetland survey; focused surveys for the Quino checkerspot butterfly, San Diego fairy shrimp, Pacific pocket mouse, and burrowing owl; and coordination with staff and the resource agencies regarding a potential MHPA boundary adjustment.

New Hope Church—Private Client, Rancho Peñasquitos, California

Served as biologist. Managed biological services for a proposed church classroom addition project in Rancho Peñasquitos. Services included preconstruction nesting bird surveys and construction monitoring; issues included MHPA adjacency and suitable coastal California gnatcatcher habitat.

Orchard Run—Private Client, Valley Center, California

Served as biologist. Managed biological services for a proposed subdivision in Valley Center. Services included general biological surveys, vegetation mapping, a formal wetland delineation, and focused surveys for the burrowing owl. Coordinated with County of San Diego staff and the resource agencies regarding impacts to jurisdictional wetlands and other waters and proposed mitigation, impacts to coastal sage scrub and the required HLP, and brush management issues. Prepared and submitted permit applications to the Corps, DFG, and RWQCB. Prepared an addendum to the biological resources report in accordance with County of San Diego guidelines and managed/assisted in the preparation of a conceptual wetland mitigation plan and a habitat management plan.

Emerald Oaks Subdivision—Private Client, Ramona, California

Served as project manager and senior biologist. Managed biological services for a proposed subdivision. Services include biological surveys; focused surveys for Quino checkerspot butterfly, Stephens' kangaroo rat, and coastal California gnatcatcher; a formal wetland delineation; and spring rare plant surveys. Negotiated with the County of San Diego and the resource agencies regarding apparent land clearing and unauthorized wetland impact violations.

Oak Country Estates—Private Client, Ramona, California

Served as senior biologist. Managed biological services for a residential subdivision on 748-acres in Ramona. Services included general biological surveys and report; focused surveys for sensitive plant species, including Orcutt's Brodiaea and southern tarplant; and focused surveys for sensitive wildlife including arroyo toad, San Diego fairy shrimp, Stephens' kangaroo rat, and coastal California gnatcatcher.

Sunset Ranch—Private Client, Riverside County, California

Served as biologist. Managed biological services for the proposed conversion of aquaculture ponds to ski lakes. This work was completed to support a conditional use permit application to the County of Riverside. Services included coordination with the resource agencies, general biological surveys, vegetation mapping, and formal wetland delineation.

Hoehn Pond—Private Client, San Diego County, California

Served as biologist. Conducted biological surveys, including general plant and wildlife surveys, vegetation mapping, and a formal wetland delineation for a pond expansion project immediately upstream of a sensitive coastal lagoon. Prepared a biological resources letter report per County of San Diego guidelines, which addressed the unauthorized expansion of an existing pond. Coordinated with the project applicant, County of San Diego staff and the resource agencies regarding the need for after-the-fact permits.

Carolino West Canyon Estates—Private Client, San Diego County, California

Served as biologist. Conducted biological surveys, including general plant and wildlife surveys, vegetation mapping, and a formal wetland delineation for a proposed residential subdivision in southern San Diego County. Prepared a biological constraints and opportunities report, which identified potential constraints to development on the subject property.

Perrin Property Violation—Private Client, San Diego County, California

Served as biologist. Completed biological resources assessment in response to apparent land clearing and unauthorized impact violations on Highland Valley Road. Services included forensic vegetation mapping, general biological surveys, wetland delineation, and preparation of a biological resources report, which identified mitigation measures to resolve the grading violation.

Jamul Property—Private Client, Jamul, California

Served as biologist. Conducted protocol surveys for the Quino checkerspot butterfly for an approximately 1,200-acre property. Documented three previously unknown populations of Quino checkerspot butterfly. Coordinated with USFWS regarding the implications of the sighting.

Legacy Estates—Private Client, Campo, California

Served as biologist. Conducted biological surveys and report preparation for a proposed subdivision. Services included general biological surveys and report, focused surveys for Quino checkerspot butterfly, wetland assessments, and negotiations with the County of San Diego.

Rancho Jamul Estates Quino Surveys—Private Client, Jamul, California

Served as biologist. Conducted protocol Quino checkerspot surveys on an approximately 80-acre property in Jamul during the 2004 flight season. A previously undiscovered Quino population was documented on site, which resulted in a westward extension of the known Quino occupation in the project area.

Davis Eagle Ranch—Private Client, Ramona, California

Served as biologist. Conducted general biological surveys for an approximately 1,300-acre property. Prepared a constraints and opportunities report to initiate consultation with the County of San Diego and the resource agencies regarding a proposal for a hardline preserve area that would maintain developable areas on site for potential future residential development. Issues include wetlands, waters of the United States, vernal pools, San Diego fairy shrimp, Stephens' kangaroo rat, arroyo toad, California gnatcatcher, and southern tarplant.

Pine Valley Estates—Tierra Environmental Services, Pine Valley, California

Served as biologist. Conducted protocol Quino checkerspot butterfly surveys for a proposed subdivision.

Kraus Property—Private Client, San Diego, California

Served as biologist. Completed biological surveys and a wetland delineation and prepared a report for a proposed residential development.

National City Commercial/Retail—Private Client, National City, California

Served as biologist. Conducted biological surveys that included vegetation mapping, general wildlife surveys, focused surveys for sensitive species, wetland delineation, and preparation of survey reports.

Whispering Hills Subdivision—Zijlstra Architecture, Elfin Forest, California

Served as biologist. Conducted biology surveys that included vegetation mapping, general wildlife surveys, and a wetland delineation for a 39-acre property. Assisted with surveys for the federally threatened coastal California gnatcatcher and the coastal cactus wren, a state species of concern. Prepared biological technical report per County of San Diego guidelines.

Alpine Subdivision (TM 5210)—REI Builders, Alpine, California

Served as biologist. Completed protocol Quino checkerspot butterfly surveys for an approximately 63-acre property.

Victoria Shangrila Subdivision—Private Client, San Diego, California

Served as biologist. Conducted biological surveys including general wildlife surveys, vegetation mapping, focused surveys for San Diego sagewort and assisted with focused surveys for the coastal California gnatcatcher. Prepared a report in conformance with County of San Diego guidelines.

Father Joe's A Children's Village (formerly PromiseLand Ranch)—S.V.D.P. Management, Inc., Campo, California

Served as biologist. Completed general biological surveys and protocol Quino checkerspot butterfly surveys for an approximately 300-acre project site in Campo. Prepared a biological resources report in conformance with County of San Diego guidelines.

Rios Canyon Ranch—Private Client, Lakeside, California

Served as biologist. Completed biological surveys, including general wildlife surveys, vegetation mapping, and a wetland delineation and focused protocol surveys for the Quino checkerspot butterfly for a proposed residential subdivision. Prepared biological resources technical report in conformance with County of San Diego guidelines.

Paseo del Sol—Private Client, San Diego, California

Served as biologist. Conducted biology surveys that included vegetation mapping, general wildlife surveys, and preparation of survey reports. Performed focused habitat assessment for the Quino checkerspot butterfly and assisted with focused surveys for the federally threatened coastal California gnatcatcher.

Sherwood Ridge—Trimark Pacific Homes, Valley Center, California

Served as biologist. Conducted biology surveys that included vegetation mapping and preparation of survey reports. Performed focused habitat assessments and adult surveys for the Quino checkerspot butterfly and assisted with coastal California gnatcatcher surveys.

Woods Valley Ranch—Newlands Communities, Valley Center, California

Served as biologist. Performed focused habitat assessments and adult surveys for the Quino checkerspot butterfly and assisted with coastal California gnatcatcher surveys. Monitored for environmental compliance during the construction of a residential subdivision.

LSC—Private Client, San Pasqual Valley, California

Served as biologist. Completed general biological surveys including general plant and wildlife surveys, vegetation mapping, and a wetland survey for a proposed development project. Prepared a constraints and opportunities report to identify potential constraints to development of the property. Issues included wetlands and sensitive species including the coastal California gnatcatcher and the coastal California cactus wren.

Land Use Planning

Wild Animal Park MHPA Boundary Change—Zoological Society of San Diego, Escondido, California

Served as biologist. Managed biological services for a proposed fire break within the Wild Animal Park. Services included conducting biological surveys, preparing a biological letter report, and coordinating with the City of San Diego regarding an MHPA boundary line adjustment.

Transportation—Airports

Ramona Airport Wetland Mitigation Project—County of San Diego Department of Public Works, Ramona, California

Served as project manager and senior biologist. Managed environmental services for a wetland mitigation project. As adjunct staff for the County of San Diego Department of Public Works, coordinated and attended meetings with The Nature Conservancy, County Department of Public Works staff, County Airport staff, County Counsel, and the resource agencies regarding purchase of land from the Cagney Family Trust for use as mitigation land for impacts to jurisdictional resources associated with the Ramona Airport improvement project. Coordinated with subcontractors regarding preparation and implementation of a vernal pool management plan and the potential need to conduct Phase II analyses on the subject property. Completed general biological surveys and a wetland delineation per the Corps' 1987 Manual for an approximately 10-acre site proposed for use as wetland creation required as mitigation for impacts associated with the project. Prepared a wetland delineation report and permit applications for submittal to the Corps, RWQCB, and DFG. Coordinated and attended meetings with the USFWS, Corps, and DFG regarding potential impacts to vernal pools, San Diego fairy shrimp, and the arroyo toad. Prepared a BA to initiate formal

Section 7 consultation with the USFWS. Prepared a supplemental EIR to address additional impacts associated with the wetland creation project. Providing preconstruction surveys and construction monitoring (in accordance with the biological opinion issued by the USFWS).

Schools

Olive Peirce Middle School and Ramona High School Master Plan—Ramona Unified School District, California

Served as project manager and senior biologist. Managing biological services for a proposed school expansion project in Ramona. Services include general biological surveys and report; focused surveys for sensitive wildlife species, including Stephens' kangaroo rat and San Diego fairy shrimp; general survey for sensitive plant species; a formal wetland delineation; preparation and implementation of a vernal pool remediation plan to mitigate unauthorized impacts to vernal pools; preparation of a BA and associated vernal pool management plan to initiate formal Section 7 consultation with the USFWS; and consultation with the Corps, RWQCB, and DFG regarding impacts to jurisdictional resources.

Alliant University Site—San Diego Unified School District, Scripps Ranch, California

Served as biologist. Completed general biological surveys and wetland delineation, prepared biological resources report and co-wrote a wetland delineation report for a proposed school site.

Energy

Tehachapi Renewable Transmission Project Biological Consulting Services—SCE, California

Served as biologist. Conducted focused surveys for the coastal California gnatcatcher.

SDG&E Sunrise Powerlink 2007 California Gnatcatcher Surveys—Arcadis, San Diego County, California

Served as biologist. Conducted focused surveys for the coastal California gnatcatcher along the preferred route for a new electric transmission line to be constructed between El Centro in Imperial County and Los Peñasquitos Canyon in San Diego County.

SDG&E Sunrise Powerlink Least Bell's Vireo Surveys—Arcadis, San Diego County, California

Served as biologist. Conducted focused surveys for the least Bell's vireo along the preferred route for a new electric transmission line to be constructed between El Centro in Imperial County and Los Peñasquitos Canyon in San Diego County.

Sunrise Powerlink Coastal California Gnatcatcher Surveys—San Diego Gas & Electric, California

Served as biologist. Conducted surveys to determine the presence or absence of the federally listed coastal California gnatcatcher.

Tehachapi Renewable Transmission Project Regulatory Compliance—SCE, Los Angeles County, California

Served as biologist. Conducted protocol surveys for the federally listed coastal California gnatcatcher.

Transportation—Roads, Bridges, and Highways

As-Needed Biological and Environmental Services—City of San Diego, Engineering and Capital Project Department, various locations in the City of San Diego, California

Erin serves as project manager for this contract to provide biological and environmental services to the City of San Diego Engineering and Capital Projects Department. As the City's primary point of contact, Erin is responsible for responding to task order requests, preparing proposals and cost estimates, staffing individual projects and tasks, ensuring QA/QC procedures are completed for all deliverables, coordinating with subcontractors, and attending meetings with City and resource agency staff. Selected projects under this on-call contract include: El Camino Real Road and Bridge Project, Georgia Street Bridge Project, Hazard Center Bike Path Project, and the La Jolla Children's Pool project. Services provided under this contract have included the preparation of CEQA/NEPA documents, technical studies (biology, etc.), mitigation plans, and permitting.

Olive Vista Drive/Jefferson Road Improvement Project—County of San Diego Department of Public Works, Jamul, California

Served as project manager. Managed environmental services for a road widening/realignment project in the unincorporated community of Jamul. Issues included impacts to jurisdictional waters and associated mitigation/permitting requirement and suitable habitat for the Quino checkerspot butterfly.

Viejas Boulevard Bridge Replacement Project—County of San Diego Department of Public Works, Descanso, California

Served as project manager and senior biologist. Managed environmental services for a bridge replacement project in Descanso. Coordinated and attended meetings with County Department of Public Works staff, Caltrans staff, and the resource agencies to discuss the project's impacts to sensitive biological resources, which included the federally endangered arroyo toad. Completed general biological surveys and a wetland delineation per the Corps' 1987 Manual for the identified project impact area and prepared an NES per Caltrans guidelines. Prepared a BA to initiate formal Section 7 consultation with the USFWS and assisted in the preparation of a conceptual mitigation plan per RWQCB standards. Providing preconstruction surveys and construction monitoring (in accordance with the biological opinion issued by the USFWS).

Willows Road Bridge—County of San Diego Department of Public Works, Alpine, California

Served as project manager and senior biologist. Managed environmental services for a potential bridge retrofitting project in Alpine. Coordinated and attended meetings with County Department of Public Works staff and Caltrans staff. Completed a general biological survey and constraints analysis. Managed the completion of focused surveys for the arroyo toad, southwestern willow flycatcher, least Bell's vireo, and coastal California gnatcatcher. Future anticipated tasks include the preparation of an NES per Caltrans guidelines, a wetland delineation, and CEQA/NEPA documentation.

SR 67/Bradley Avenue Interchange Improvements—County of San Diego Department of Public Works, California

Erin served as senior biologist managing all biological aspects of this road-widening project located in both the City and County of San Diego. She conducted focused and general biological surveys and prepared an NES per Caltrans guidelines, which included a discussion of potential impacts to resources under the jurisdiction of the Corps, DFG, and the RWQCB. Erin also worked closely with County staff and engineers during the final design of the noise walls to minimize impacts to sensitive resources.

Old Morongo Road—County of Riverside, California

Served as senior biologist. Managed biological aspects of a road-widening/paving project. Prepared an NES (per Caltrans guidelines) for submittal to the County of Riverside and Caltrans. Issues included impacts to waters of the United States, waters of the state and potential impacts to the federally and state-listed desert tortoise.

Cypress Avenue Overcrossing Project—City of Fontana/County of San Bernardino, California

Served as senior biologist. Managed biological aspects of an overcrossing project located in the City of Fontana and the County of San Bernardino. Prepared an NES per Caltrans guidelines. Issues included potential impacts to the federally endangered Delhi Sands Flower-loving Fly.

Avenue 54—County of Riverside, California

Served as senior biologist. Managed biological aspects of a road-widening/paving project. Prepared an NES per Caltrans guidelines for submittal to the County of Riverside and Caltrans.

Avenue 53—County of Riverside, California

Served as senior biologist. Managed biological aspects of a road-widening/paving project. Prepared an NES per Caltrans guidelines for submittal to the County of Riverside and Caltrans.

SR 74/Sherman Road—County of Riverside, California

Served as senior biologist. Managed biological aspects of a road improvement project. Prepared an NES per Caltrans' guidelines for submittal to the County of Riverside and Caltrans.

SR 54/SR94 Road Widening Project—County of San Diego Department of Public Works, Rancho San Diego, California

Served as biologist. Managed and completed focused surveys for the Quino checkerspot butterfly and wetland delineation. Prepared a wetland delineation report and BA as part of the Section 7 consultation to address potential impacts to least Bell's vireo and the coastal California gnatcatcher.

Black Canyon Road Bridge—County of San Diego Department of Public Works, California

Served as project manager and senior biologist. Managed environmental services for a bridge project. Services include noise studies; a visual analysis; historic and cultural resource surveys; focused surveys for the Quino checkerspot butterfly, arroyo toad, least Bell's vireo, southwestern willow flycatcher, and coastal California gnatcatcher; general biological surveys; formal wetland delineation, and rare plant surveys (including surveys for plants known to be used by Native American tribes for basket weaving). Prepared an NES and BA per Caltrans format for submittal to Caltrans, the Corps, and the USFWS as part of the informal Section 7 consultation. Coordinated and attended meetings with

Caltrans, County staff, Forest Service staff, and the resource agencies regarding potential impacts to jurisdictional resources and sensitive species. Prepared permit applications for the Corps, DFG, and RWQCB as adjunct staff for the County of San Diego Department of Public Works and assisted in the preparation of a conceptual wetland mitigation plan and an EA. Providing preconstruction surveys and construction monitoring.

Dairy Mart Road—City of San Diego Metropolitan Wastewater Department, California

Served as biologist. Provided biological services for a road and bridge improvement project, which included noise monitoring in association with adjacent least Bell's vireo locations, construction monitoring, and revegetation implementation. Supervised revegetation installation and maintenance and conducted revegetation monitoring, which included success criteria to ensure the long-term viability of the revegetation site. Prepared annual reports to be submitted to MWWD staff, Corps, and DFG.

El Capitan Reservoir Road Widening—City of San Diego Water Department, Lakeside, California

Served as biologist. Performed wetland delineation for a project involving widening of the access road to El Capitan Reservoir, east of El Cajon. Co-wrote a wetland delineation report to support permit applications to the Corps, RWQCB, and the DFG.

Valley Center Road Widening—County of San Diego Department of Public Works, Valley Center, California

Served as project manager and senior biologist. Completed vegetation and wetland delineation analyses along a six-mile section of Valley Center Road proposed for widening. Duties involved preparing a comprehensive vegetation map of the site and completing a delineation of all wetland resources that may potentially be impacted by the road widening project. In addition, as adjunct staff for the County of San Diego Department of Public Works, coordinated and consulted with County engineers and consultants regarding the preparation and implementation of a wildlife movement corridor study for Valley Center Road.

Landfills

Otay Landfill Project—County of San Diego Department of Public Works, California

Served as project manager and senior biologist. Managed environmental services for a project involving a proposed minor amendment to the MSCP. Services included assessment of the presence of vernal pools/vernal swales/road ruts, sensitive plant surveys, coastal California gnatcatcher surveys, Quino checkerspot butterfly surveys, general biological surveys/vegetation mapping, and preparation of biological resources technical report.

Mines and Quarries

SR-76 Widening Rosemary's Mountain Quarry—Granite Construction, Fallbrook, California

Erin served as senior biologist/biological task manager for this project that involved the widening of a 1.25-mile section of SR-76. She conducted updated vegetation mapping for the previously approved Rosemary's Mountain quarry project; attended meetings with representatives from the County of San Diego, USFWS, DFG, and Corps; and prepared a BA as part of the formal Section 7 consultation to address potential impacts to arroyo toad, least Bell's vireo, southwestern willow flycatcher, and the coastal California gnatcatcher. Erin worked closely with Granite, County staff, and the engineers regarding the road alignment and widening and the associated effects, but during construction and operation of the roadway, on sensitive bird species. Erin also managed the development of mitigation plans for impacts to arroyo toad and riparian/wetland vegetation; ICF is currently providing long-term monitoring of the riparian/wetland mitigation site.

Campo Sand Mine—Tierra Environmental Services, Campo, California

Served as biologist. Completed protocol Quino checkerspot butterfly surveys for an approximately 300-acre project site. The project consists of a proposed sand mine operation.

Native American Projects

Morongo Water Bottling Plant—Morongo Band of Mission Indians, Riverside County, California

Served as biologist. Completed wetland delineation and general biological surveys for an approximately 85-acre site on the Morongo Indian Reservation in eastern Riverside County. Conducted focused surveys for the federally listed desert tortoise and co-wrote a report to be submitted to the USFWS.

Cellular and Radio Towers

KCBQ Radio Towers—KCBQ Radio, Lakeside, California

Served as biologist. Conducted general biological surveys and protocol Quino checkerspot butterfly surveys and assisted with protocol surveys for the coastal California gnatcatcher. Prepared biological resources technical report in conformance with County of San Diego guidelines.

Recognition and Commendations

On-Call Biological Consulting (Widget); Task for SKR Monitoring—San Diego Gas & Electric, San Diego County, California

"I wanted to thank ICF for providing a SKR monitor on such short notice…I really appreciate your responsiveness for this last-minute request. The construction supervisor was impressed with the monitor and was excited to learn about the SKR."

— Taschia Houston, Environmental Specialist, San Diego Gas & Electric

On-Call Environmental Services—Otay Water District, Spring Valley, California

“In their role as our as-needed consultant, ICF has proven to be invaluable to the District with their expertise in all aspects of environmental services. Erin Schorr is an excellent Project Manager, knowledgeable, responsive and proactive, really great to work with. We have used ICF for a variety of environmental projects and they have done consistently excellent work for us. As Project Director for several projects with the District, I appreciate that Ted Lee is always available to answer questions and ensure that we are provided with the services that we need in an efficient and timely manner.”

— Lisa Coburn-Boyd, Environmental Compliance Specialist, Otay Water District

As-Needed Environmental Services—County of San Diego Department of Public Works, California

“Erin has excellent technical knowledge as well as excellent skills on how to acquire knowledge quickly and efficiently… Erin has excellent project management skills, including mentoring, interpersonal, communication, and organizational skills that are important in project management. Erin has excellent written and verbal communication skills and has the ability to demonstrate those skills one on one or in group settings. Erin is an excellent employee who I enjoy working with and my clients enjoy working too.”

— Nelson Olivas, formerly the Program Coordinator of the County of San Diego Department of Public Works

Employment History

ICF International Inc. Branch Leader/Senior Biologist/Southern California Biology Team Leader/San Diego Biological Resources Team Leader. San Diego, California. 09/1998–Present.

Appendix M
History of Agency Consultation

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From: Greer, Keith [mailto:Keith.Greer@sandag.org]
Sent: Tuesday, May 20, 2014 11:19 AM
To: Marsden, Dean
Cc: 'Lavender-Martin, Sandra E@DOT'
Subject: RE: REMP Working Group Meeting Minutes (I-5 NCC Project)

Dean – Here are the USFWS, USACE-LA and CCC emails regarding the language on temporary impacts associates with the lagoon enhancements.

Sandra can you pass along Tim Dillingham's comments and any comments from the Carlsbad USACE.

What this means for you, is that the resources agencies are not going to require that we mitigate areas of wetlands that we impact. We may not get credit, but they will not call them an impact and there will be no ratio applied to the restoration.

If you have any question please call.

Keith Greer, SANDAG
619-699-7390

From: Brown, Sally [mailto:sally_brown@fws.gov]
Sent: Tuesday, May 20, 2014 11:12 AM
To: Lavender-Martin, Sandra E@DOT
Cc: aevans@dudek.com; Kosup, Allan R@DOT; awinecki@dudek.com; Jacobo, Arturo@DOT; Bryant.Chesney@noaa.gov; April, Bruce@DOT; goldmann.elizabeth@epa.gov; Buhr, Gabriel@Coastal; Greer, Keith; Smith, Kim T@DOT; Porter, Mike@Waterboards; McCaffery, Emery@DOT; Harrison, Shay Lynn M@DOT; Spencer.D.Macneil@usace.army.mil; Stephanie.J.Hall@usace.army.mil; Scatolini, Susan@DOT; susan_wynn@fws.gov; Brown, Kanani@Coastal; mcooper@scc.ca.gov; Larry.Vinzant@dot.gov; tim_dillingham@wildlife.ca.gov; Therese.O.Bradford@usace.army.mil; Meris.Bantilan-Smith@usace.army.mil
Subject: Re: FW: Temporary Impact/Mitigation Language + REMP WKGP Structure

Hi Sandra,
Susan and I have no further comments, thanks for the opportunity to review!

Sally Brown
U. S. Fish and Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008
Office: (760) 431-9440 x278
Cell: (619) 261-6027
FAX: (760) 431-5901
Sally_Brown@fws.gov

From: Hall, Stephanie J SPL [mailto:Stephanie.J.Hall@usace.army.mil]
Sent: Tuesday, May 20, 2014 9:58 AM
To: Buhr, Gabriel@Coastal; Lavender-Martin, Sandra E@DOT; aevans@dudek.com; Kosup, Allan R@DOT; awinecki@dudek.com; Jacobo, Arturo@DOT; Bryant.Chesney@noaa.gov; April, Bruce@DOT; goldmann.elizabeth@epa.gov; Greer, Keith; Smith, Kim T@DOT; Porter, Mike@Waterboards; McCaffery, Emery@DOT; Sally_Brown@fws.gov; Harrison, Shay Lynn M@DOT; Macneil, Spencer D SPL; Scatolini,

Susan@DOT; susan_wynn@fws.gov; Brown, Kanani@Coastal; mcooper@scc.ca.gov; Larry.Vinzant@dot.gov; tim_dillingham@wildlife.ca.gov; Bradford, Therese O. SPL; Bantilan-Smith, Meris SPL
Subject: RE: Temporary Impact/Mitigation Language + REMP WKGP Structure (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Sorry Sandra,

The Corps is also fine with the language regarding "Temporary Impact/Mitigation Language below...

-Stephanie

Stephanie J. Hall
Senior Project Manager, Caltrans Liaison Transportation & Special Projects Branch USACE Los Angles District, Regulatory Division
915 Wilshire Blvd, Suite 930, Los Angeles, California 90017-3401
P: 213.452.3410 | M: 213.304.9682 | F: 213.452.4196

Assist us in better serving you!
You are invited to complete our customer survey, located at the following link:
http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey

From: Buhr, Gabriel@Coastal [mailto:Gabriel.Buhr@coastal.ca.gov]
Sent: Tuesday, May 20, 2014 8:07 AM
To: Lavender-Martin, Sandra E@DOT; aevans@dudek.com; Kosup, Allan R@DOT; awinecki@dudek.com; Jacobo, Arturo@DOT; Bryant.Chesney@noaa.gov; April, Bruce@DOT; goldmann.elizabeth@epa.gov; Greer, Keith; Smith, Kim T@DOT; Porter, Mike@Waterboards; McCaffery, Emery@DOT; Sally_Brown@fws.gov; Harrison, Shay Lynn M@DOT; Spencer.D.Macneil@usace.army.mil; Stephanie.J.Hall@usace.army.mil; Scatolini, Susan@DOT; susan_wynn@fws.gov; Brown, Kanani@Coastal; mcooper@scc.ca.gov; Larry.Vinzant@dot.gov; tim_dillingham@wildlife.ca.gov; Therese.O.Bradford@usace.army.mil; Meris.Bantilan-Smith@usace.army.mil
Subject: RE: Temporary Impact/Mitigation Language + REMP WKGP Structure

Both look fine to me Sandra.

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Gabriel Buhr
Coastal Program Manager

California Coastal Commission
San Diego District Office
7575 Metropolitan Drive, Suite 103
San Diego, CA 92108
(619) 767 2370
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On Tue, May 20, 2014 at 7:58 AM, Lavender-Martin, Sandra E@DOT <sandra.lavender@dot.ca.gov> wrote:

Good Morning Everyone!

Just following up to see if anyone has any comments on the attached REMP Structure and/or the Temporary Impact Language below. To date, I have only received comments from Tim. Please provide any comments by this Thursday COB, so that these items can be finalized.

Thank you,

Sandra

From: Lavender-Martin, Sandra E@DOT
Sent: Monday, April 28, 2014 3:44 PM
To: 'aevans@dudek.com'; 'allan_kosup@dot.ca.gov'; 'awinecki@dudek.com'; 'arturo_jacobo@dot.ca.gov'; 'Bryant.Chesney@noaa.gov'; 'bruce_april@dot.ca.gov'; 'goldmann.elizabeth@epa.gov'; 'gbuhr@coastal.ca.gov'; 'kgr@sandag.org'; 'kim_t_smith@dot.ca.gov'; 'mporter@waterboards.ca.gov'; 'emery_mccaffery@dot.ca.gov'; 'Sally_Brown@fws.gov'; 'shay_lynn_harrison@dot.ca.gov'; 'Spencer.D.Macneil@usace.army.mil'; 'Stephanie.J.Hall@usace.army.mil'; 'susan_scatolini@dot.ca.gov'; 'susan_wynn@fws.gov'; 'kbrown@coastal.ca.gov'; 'mcooper@scc.ca.gov'; 'Larry.Vinzant@dot.gov'; 'tim_dillingham@wildlife.ca.gov'; 'Therese.O.Bradford@usace.army.mil'; 'Meris.Bantilan-Smith@usace.army.mil'
Subject: Temporary Impact/Mitigation Language + REMP WKGP Structure

Hello Everyone,
The proposed temporary impact/mitigation language for the REMP is below. The poposed structure for the REMP Working Group has been revised to include all edits received to date. Please review both and provide comments by Tuesday, May 6th.

Temporary Impact/Mitigation Language
Implementation of Resource Mitigation and Enhancement Program (REMP) as outlined in the NCC Public Works Plan will result in some temporary impacts to low quality wetlands, such as disturbed wetlands and non-tidal salt marsh, to re-establish, restore, and enhance high quality tidal and freshwater wetlands. Any potential impacts resulting from the re-establishment, restoration, and enhancement will be identified in the site specific HMMPs. No additional mitigation would be required for these temporary impacts as long as there is a net benefit or a significant increase in quality and function of the re-established/restored/enhanced wetlands. If any portion of the mitigation site fails to meet its success criteria under the HMMP, no credits would be released and mitigation for temporary impacts maybe required at that time.

Thank you,
Sandra

Sandra Lavender-Martin
Associate Environmental Planner
Department of Transportation - District 11
Environmental Stewardship/Ecological Studies Branch
P: (619) 688-0115

CITY OF SAN DIEGO EL CAMINO REAL ROAD/BRIDGE PROJECT
AGENCIES MEETING

Meeting Notes for September 26, 2012

Attendees

City: Kerry Santoro, Jerry Jakubauskas, Brad Johnson
Rick Engineering: Edgar Camerino, Brendan Hastie
RECON: Lisa Lind
Hon Consulting: Katherine Hon
Nordby Biological: Chris Nordby
RBF: Monica Kling
Caltrans: Kevin Hovey, Bob James
CDFG: Tim Dillingham, Libby Lucas, Kyle Dutro
US Fish and Wildlife: Sally Brown
USACOE: Michelle Madsen, Stephanie Hall
State Water Board: Alan Monji

Discussion

1. Review of Project Purpose and Need (City) – Following introductions, Kerry provided an overview of the project, including the project purpose related to the structural deficiencies and potential flood hazards of the existing El Camino Real Bridge. The bridge is not high enough for a 100 year flood event and does not meet current seismic standards.

2. Background/History/Timetable (City) – 1998 FHWA approved funding for the project with a 10-year timeline. In 2006 a Draft EIR was circulated for public review. Since that time, the City has been looking into additional alternatives and narrowing the footprint in response to community and agency concerns. The City also updated technical studies. The City was also granted an extension from FHWA and as a result is looking to complete the environmental by March 2013. Because the March 2013 deadline may not be met, Caltrans on behalf of the City has requested an unprecedented second extension. The City is currently waiting for the FHWA decision.

3. Current Project/Changes from Past Project – Bridge Design (Rick Engineering) – Edgar and Brendan reviewed the major changes, including: a reduction of 18-feet for the cross sections with reduced widths for travel lanes, bicycle lanes, and medians, a new tie-in to the D R Horton project, and eliminating the channel on the Kruer (former Hu) property in place of a new storm drain plan. Removal of the existing bridge after construction of a new bridge, and the introduction of roundabout alternatives are also changes from the past project. USACOE requested clarification on the length of the bridge and requested that a longer bridge be evaluated. Brendan indicated that the proposed bridge meets the hydraulic requirements. A longer bridge is discussed in the Alternatives Considered but Rejected chapter of both the EIR and the EA. The current proposed bridge design maintains the width of the channel for the protection of clapper rail habitat, and a longer bridge would not provide a benefit to clapper rail habitat. The river channel only carries the 10-year flow within its banks. Higher flows overtop the river banks. The substructure of the bridge needs to be clearly defined and may need to be retained so as not to negatively affect that area. All aboveground elements of the existing bridge will be removed entirely. When the engineers say the "substructure" would remain, they mean the buried piles. Rick Engineering clarified that the bridge for the Eastern Alignment and Roundabout alternatives is at an angle for geometry, so the road can meet De La Valle Place. This design does not affect hydraulics because the columns are round.

Agencies requested additional exhibits be added to the document, including an existing cross-section and a cross-section exhibit for each of the project alternatives. In addition, the location of the sewer line and protective rip rap blanket should be noted. Sally would like to see the rip rap blanket removed if it isn't necessary to protect the columns; however, we need to look at whether a stabilized river bed may be something the clapper rail like and therefore replacing the rip rap blanket would be needed to avoid impacts.

The agencies requested that the environmental documents disclose that this project would not limit or preclude what can happen on the Fairbanks Ranch property, including creation of additional riparian areas. CDFG clarified that the diagram of mitigation that was supposed to occur attached to their 2006 letter was to be a gentle transition of freshwater marsh with riparian scrub terrace, not a widening of the river.

Michelle asked for clarification of the City departments and Kerry explained what Real Estate Assets, Development Services, and Capital Improvements do.

4. Bridge Construction Methodology Memorandum (Rick Engineering) -- Rick Engineering discussed the two methodologies that will be included in the Draft EIR: berm versus trestle. The agencies provided their major concerns: berm would result in fill and a potential for washout during a significant rain event while the trestle would require piles for false work. The trestle would allow construction equipment to be above low river flows. CDFG requested data for sediment transport through the river channel and clear description of the materials that will be used to construct the berm. Kevin suggested that the environmental documents explain what storm event might wash out a berm. USACOE said the trestle may be preferable to the berm for construction; however, the agencies did not identify a preferred method and noted they will wait until the Draft EIR is out for public review in order to assess impacts for both options. All are looking for analysis that considers wildlife movement, hydrology, and duration of construction.

5. Other Impacts/Concerns (Nordby/Agencies) – USFWS brought up potential impacts to mule-fat scrub as a result of the grading under the north abutment. Brad mentioned that the north bridge abutment of the new bridge will be approximately 9 feet higher than the existing bridge, and as a result of the new fill, the existing vegetation will be disturbed regardless of whether or not a trail is constructed. There was confusion about the map of biological impacts showing impacts west of the existing bridge, and this needs to be clarified. The north abutment has been designed to accommodate a planned JPA trail. Per NEPA Section 4(f) requirements the project must not preclude any existing or future (planned) trail. This issue will be looked at. Eastern Alignment as City preferred alternative was raised as a concern by both wildlife agencies due to potential wetland impacts. Environmental documents need to clearly state impacts from all alternatives. Kevin stated Caltrans does not know yet which alternative is less impactive, and emphasized they have to consider more than biological resources impacts.

6. Mitigation (City/Nordby/Agencies) – Project impacts include disturbance of the salt marsh on the Kruer property, however mitigation for this vegetation community is not available on the JPA mitigation site for this project. There would be excess freshwater marsh creation available to satisfy the other mitigation requirements, and that could include Clapper Rail habitat mitigation needs. Chris noted that the mitigation approach to be ultimately approved will dictate if the JPA mitigation site can accommodate all of the mitigation needs for the project. Michelle noted that a proposed invasives removal plan in the river that would be implemented sooner rather than later would be viewed favorably. They are looking for a watershed approach. Tamarisk and pampas grass removal upstream would help protect the future W-19 restoration and the San Dieguito Lagoon restoration downstream. She suggested proposing this aspect as part of the mitigation plan rather than having the agencies require it as maintenance. Libby asked what was the invasive removal requirement for Fairbanks Ranch and the Polo Field code violation. This cannot be counted twice and may limit the "credit" for invasive removal plans as part of El Camino Real. Michelle stated they understand the expense associated with the "in perpetuity" requirement and would accept a defined time frame. The City will confirm if this mitigation has already been established as mitigation for the Fairbanks Ranch project and if it would be a viable option for this project. The agencies were interested in what would happen to the vacated roadway. Sally, Michelle and Libby agreed they would like to see the asphalt removed. Jerry explained that a portion will need to be retained for access to adjacent properties. The agencies asked if any of the W-19 acreage would be available for Fairbanks Ranch mitigation, and Kerry said she didn't think so, given the number of projects already wanting to use the mitigation area, including LOSSAN, I-5 widening, and El Camino Real.

From: Elizabeth Lucas [mailto:ELucas@dfg.ca.gov]
Sent: Thursday, November 15, 2012 12:50 PM
To: Santoro, Kerry
Cc: Kyle Dutro; Tim Dillingham; 'kevin_hovey@dot.ca.gov'; 'Robert A James'; Sally_Brown@fws.gov; nordbybio@gmail.com; aashimine@rbf.com; 'Lisa Lind'; bhastie@rickengineering.com; ecamerino@rickengineering.com; Johnson, Brad; Marsden, Dean; Jerry Jakubauskas; Michelle L SPL Mattson; stephanie.j.hall@usace.army.mil; Alan@Waterboards' 'Monji
Subject: El Camino Real Project Update Meeting Minutes

Hello Kerry,

Thank you for the minutes of the 9-26 meeting on the El Camino Real Bridge Project (Project). Just for the record, the minutes did not capture the following two points made during the meeting (for our purposes, this email effectively modifies the minutes).

1. DFG requested that the recirculated EIR address all the comments in the Wildlife Agencies' October 26, 2006, letter on the draft EIR for the Project.

2. Because the equestrian trail was a subject of significant discussion during the meeting, DFG explicitly pointed to comment #11 in that 2006 letter; that comment addresses the need for the EIR to include in its analysis the impacts of the equestrian trail (not just the grading for the trail).

Regarding the discussion of invasive species removal in San Dieguito River (item #6 in the minutes), attached is DFG's 2003 letter re: the last nine holes of the Fairbanks Ranch golf course; see #7 on page 4 re: the invasive species removal within the River. I assume that the City also required on-going invasive species removal within this reach of the River, but don't know for sure.

I think you were going to include the sign-in sheet for the 9-26 meeting with the minutes. Would you please email it out now?

Thank you.

Libby

Libby Lucas
Staff Environmental Scientist
NCCP Program
California Department of Fish and Game
3883 Ruffin Road
San Diego CA 92123
Phone: 858 467-4230
Fax: 858 467-4299
e-mail: ELucas@dfg.ca.gov

STATE OF CALIFORNIA-THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF FISH AND GAME

FACSIMILE TRANSMITTAL

TO: **Donna Clark, Environmental Planner**
City of San Diego
Development Services Center
Telephone (619) 446-5387
Fax (619) 446-5499

State Clearinghouse
Fax (916) 323-3018

FROM: **Libby Lucas**
South Coast Region
4949 Viewridge Avenue
San Diego, California 92123
Telephone (858) 467-4230
Fax (858) 627-3984

DATE: **10/23/06** **TIME:**

 # OF PAGES SENT INCLUDING TRANSMITTAL SHEET 20

COMMENTS:

This is the joint comment letter from the Department of Fish and Game and the U.S. Fish and Wildlife Service on the Draft Environmental Impact Report for the El Camino Real Road Widening/ Bridge Replacement Project (SCH# 1999071104). We will also send the City the letter by regular mail, and copies to the cc's by regular mail.

IF YOU DO NOT RECEIVE ALL OF THE PAGES INDICATED PLEASE CALL THE SENDER AS SOON AS POSSIBLE.

US Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92011
(760) 431-9440
FAX (760) 431-5902

California Department of Fish & Game
South Coast Regional Office
4949 Viewridge Avenue
San Diego, California 92123
(858) 467-4201
FAX (858) 467-4299

In Reply Refer to:
FWS-SDG-3236.4

October 23, 2006

Donna Clark, Environmental Planner
City of San Diego
Development Services Center
1222 First Avenue, MS 501
San Diego, California 92101

Re: Comments on the Draft Environmental Impact Report for the El Camino Real Road Widening/Bridge Replacement Project (SCH# 1999071104)

Dear Ms. Clark:

The California Department of Fish and Game (Department) and U. S. Fish and Wildlife Service (Service) (collectively, "Wildlife Agencies") have reviewed the above-referenced draft environmental impact report (DEIR) for the El Camino Real Road Widening/Bridge Replacement Project, which we received on July 26, 2006. The public review period for this DEIR ends on October 21, 2006, a Saturday. However, on October 18, 2006, you kindly granted the Wildlife Agencies an extension until 5:00 PM on Monday, October 23. We appreciate the extension.

The primary concern and mandate of the Service is the protection of public fish and wildlife resources and their habitats. The Service has legal responsibility for the welfare of migratory birds, anadromous fish, and endangered animals and plants occurring in the United States. The Service is also responsible for administering the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*). The Department is a Trustee Agency and a Responsible Agency pursuant to the California Environmental Quality Act (CEQA) and is responsible for ensuring appropriate conservation of fish and wildlife resources including rare, threatened, and endangered plant and animal species, pursuant to the California Endangered Species Act (CESA), and other sections of the California Fish and Game Code. The Department also administers the Natural Community Conservation Planning program.

The proposed project would modify the 0.5 mile segment of El Camino Real between Via de la Valle and San Dieguito Road and replace the bridge over the San Dieguito River in order to improve the structural integrity of the bridge, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, relieve traffic congestion, and improve consistency with the adopted land use plan in the project area. Approximately 1,000 feet of Via de la Valle would also be widened to accommodate the new configuration of El Camino Real. The western portion of the project site is within the Subarea II of the Future Urbanizing Area, and the eastern portion is in the Fairbanks Ranch Country Club Community Planning Area. Portions of the project are within the Multiple Habitat Preservation Area (MHPA) of the City of San Diego's (City) Multiple Species Conservation Program (MSCP) Subarea Plan. El Camino Real is upstream of San Dieguito Lagoon and the restoration efforts for the Lagoon under way by the San Dieguito River Park Joint Powers Authority (JPA) Restoration Plan.

On December 12, 2002, we sent the City a comment letter on the notice of preparation (NOP) of a draft environmental impact report / environmental assessment for the project. From April 10, 2002, through October 25, 2005, we attended several meetings coordinated by the City of San Diego (City) on the proposed project. We also corresponded with the City through many electronic mails, providing feedback on the subjects addressed at the meetings and on the minutes for the meetings.

We appreciate the City's efforts to resolve major issues related to the potential project-related biological impacts prior to preparation of the DEIR, so that the document circulated for public review would reflect avoidance and mitigation measures that satisfy the requirements and recommendations of the Wildlife Agencies and other resource agencies (*e.g.*, California Coastal Commission, Regional Water Quality Control Board, U.S. Army Corps of Engineers). However, as the DEIR acknowledges, there are several outstanding matters that remain to be resolved through further coordination and consultation with the agencies. From our perspective, the primary outstanding matters are the project-related (a) potential negative impacts on the Federal and State endangered light-footed clapper rail (*Rallus longirostris levipes*, clapper rail), also a State Fully Protected Species, and (b) proposed wetland mitigation.

For the City's preferred alternative (*i.e.*, the Eastern Alignment Alternative, EAA), the new bridge would be set on a diagonal, completely separate from the existing El Camino Real bridge. The west edge of the new bridge would be approximately 50 feet east of the existing bridge at the south end, and approximately 90 feet east of the existing bridge at the north end. The new bridge would be 354 feet long, approximately 14 feet longer than the existing bridge, and 94 feet wide and would have two sets of three piers each. By comparison, the existing bridge is 340 feet long and 27 feet wide and has eight piers.

The EAA is the only build alternative for which the existing bridge would be retained and vacated by the City to the JPA for non-vehicular use as a trail for pedestrians, equestrians, and bicyclists. Changes to this bridge would be minimal. The new bridge for the EAA would also have pedestrian walkways and bike lanes in the road and bridge cross section.

As with all the build alternatives, the river banks under the new bridge would be excavated to have a steeper slope than currently exists. The steeper bank slopes would be protected from erosion by rip rap that would be toed into the river bed. The steep slopes and bridge shading would prevent successful planting of open stabilization materials, so such materials are not proposed for the new bridge abutments. The existing rip rap under the river bed that currently protects the sewer pipeline would be replaced if it were disturbed by construction. The river banks under the existing bridge would not be steepened.

As with all except one of the six build alternatives, the EAA would provide a JPA multi-use trail crossing under the north bridge abutment. The trail platform would be set at the 10-year flood level (approximately 13 feet above mean sea level). The under crossing would be paved, and would be approximately 12 feet wide. It would connect to the existing public trail along the north bank of the river east of El Camino Real, and the planned Coast to Crest Trail alignment on the north bank of the river west of El Camino Real.

In addition to the clapper rail, the sensitive wildlife species within the project's area of potential effect include least Bell's vireo (*Vireo bellii pusillus*, a Federal and State endangered species, vireo), white-tailed kite (*Elanus leucurus*, a State Fully Protected Species), American bittern (*Botaurus lentiginosus*), and the following State Species of Special Concern: yellow warbler (*Dendroica petchia*), Vaux's swift (*Chaetura vauxi*), white-faced ibis (*Plegadis chihi*), and northern harrier

(*Circus cyaneus*). Of these, yellow warbler and the clapper rail are known to nest within the project alignment. While the clapper rail is an MSCP-covered species, the Federal MSCP permit does not authorize harm or lethal take for the species. And, since the clapper rail is a State Fully Protected Species, take authorization from the State is not feasible.

The losses of sensitive habitats associated with the EAA include the following: 4.57 acres of wetland habitats, over half of which are occupied by clapper rail; and 0.77 acre of coastal sage scrub (no habitat occupied by the coastal California gnatcatcher). The DEIR proposes to mitigate for the losses of wetland habitats by the construction, creation, and enhancement of wetland habitats to the west of (*i.e.*, downstream) El Camino Real on the JPA's property (formerly the Boudreau property) and along the San Dieguito River. The DEIR provides considerable detail about the phases of the construction and creation of the proposed wetland mitigation habitats (*i.e.*, coastal brackish marsh, riparian scrub, and high salt marsh). Among the other biological mitigation measures included in the DEIR are the following, most of which pertain to project construction.

a. Regardless of the alternative built, no construction would occur within the River corridor during the breeding season of the clapper rail and vireo (February 15 to September 15).

b. Noise from construction activities outside of the River corridor would be prohibited from exceeding 60 dBA at the River corridor during the breeding seasons of the clapper rail and the vireo.

c. Outside of the breeding seasons, construction in the River would occur during daylight hours.

d. All construction equipment would be removed from the wildlife corridor at the end of each construction day.

e. Staging areas and storage areas for equipment and materials would be located outside of the River.

f. Temporary construction lighting has not been proposed as part of the project.

g. A qualified biologist would train the construction crews and field workers to avoid unnecessary impacts to biological resources in the area.

h. Prior to the start of construction, the project biologist would supervise the placement of orange construction fencing or equivalent along the limits of disturbance within and surrounding sensitive habitats as shown on the approved plans to protect adjacent environmentally sensitive lands including sensitive upland and wetland habitat.

i. All construction activities (including staging areas) shall be restricted to the development areas as shown on the approved plan. A qualified biologist would monitor all phases of the construction to minimize impacts on sensitive species, and ensure that the construction activities do not encroach into biologically sensitive areas beyond the limits of disturbance as shown on the approved plan.

j. If unauthorized disturbances occur or sensitive biological resources are discovered that were not previously identified on the Landscape Construction Documents and/or the revegetation/restoration monitoring exhibit, the contractor would be directed to temporarily divert construction in the area of disturbance or discovery and immediately notify the appropriate people.

k. After completion of construction, permanent low-sodium lighting would be installed along the El Camino Real bridge, and directed away from the MHPA and areas that might be used for wildlife movement.

To assist the City in avoiding, minimizing, and adequately mitigating project-related impacts to biological resources, and to assure that the project is consistent with the City's MSCP Subarea Plan, we offer our recommendations and comments in the Enclosure. The comments and recommendations are based on the information provided during the meetings we attended, the minutes from those meetings, our previous correspondence with the City (cited above), our knowledge of sensitive and declining vegetation communities in San Diego County, and our participation in regional conservation planning efforts. In summary, our primary comments address the following: (1) consultation between the City and the Wildlife Agencies; (2) need to revise the DEIR and recirculate it for public review; (3) future management of the reach of San Dieguito River upstream of El Camino Real; (4) construction-related impacts to the clapper rail during and outside of the breeding season; (5) reducing and re-quantifying the loss of clapper rail habitat; (6) inadequate analyses of the post-construction impacts on the clapper rail, including impacts from the project-related hydraulic and hydrologic modifications, and the proposed equestrian trail; (7) concerns about the proposed wetland mitigation and alternatives to consider; and (8) the need to resolve the matter of the Fairbanks Ranch Country Club's wetland mitigation obligations per the 1981 EIR, prior to proceeding with the proposed project.

The Wildlife Agencies appreciate the opportunity to comment on this DEIR. We are hopeful that further consultation between the City and us will ensure the protection we find necessary for the biological resources that will be affected by this project. Please contact Libby Lucas of the Department at (858) 467-4230 or Kurt Roblek of the Service at (760) 431-9440 if you have any questions or comments concerning this letter.

Sincerely,

Carol A Roberts

Therese O'Rourke
Assistant Field Supervisor
U.S. Fish and Wildlife Service

Theresa A. Stewart

Michael J. Mulligan
for Deputy Regional Manager
California Department of Fish and Game

Enclosure

cc: California Coastal Commission (Ellen Lirley)
Department of Fish and Game (Marjorie Caisley, Libby Lucas, Kris Vyverberg, Tamara Spear)
Federal Highways (Steve Healow)
Regional Water Quality Control Board (Mike Porter)
San Dieguito River Valley Conservancy (Craig Adams)
U.S. Army Corps of Engineers (Stephanie Hall)
U.S. Environmental Protection Agency (Elizabeth Goldmann)
U.S. Fish and Wildlife Service (Carolyn Lieberman)

Wildlife Agency Comments and Recommendations on the Draft Environmental Impact Report for the El Camino Real Road Widening/Bridge Replacement Project, San Diego, California

Our comments and recommendations are not in order of priority, but rather in chronological order, with pre-construction considerations first, followed by considerations related to the construction period, followed by post-construction considerations.

PRE-CONSTRUCTION

Consultation with the Wildlife Agencies

1. As the DEIR indicates, it is likely that the effects of the proposed project on light-footed clapper rail (clapper rail) and least Bell's vireo (vireo) will require Section 7 consultation under the Act. The DEIR also indicates that the City contemplates applying to the Department for authorization for take of clapper rail under CESA, specifically section a 2080.1 of the Fish and Game Code. Because the clapper rail is a State Fully Protected Species, the Department cannot authorize its take. It is essential that the project result in no take of this species, and why, the continued pre-project consultation is critical.

2. As evidenced by the ensuing comments and recommendations, there are many matters that remain to be resolved for the project to proceed. Among the matters we wish to discuss in depth during further consultation are:

   a. the feasibility of the Central Alignment Alternative (*e.g.*, the duration of the construction);[1]

   b. the project-related impacts on the clapper rail and measures to avoid or minimize the impacts (see comments under the During Construction and Post-Construction sections);

   c. the proposed wetland mitigation (see comments under the Post-Construction section); and,

   d. the methodology and biological implications of the hydraulic and hydrologic studies conducted for the project (see comments under the Post-Construction section).

3. We do not yet have enough information to determine, with the exception of the No Build Alternative, which of the alternatives would have the least significant biological impacts. We must consider the impacts of the demolition of the existing bridge, both during and after its demolition. In this regard, we request some elaboration. Our understanding is that the EAA is the only build alternative that would not involve the demolition of the existing bridge. If the bridge is not demolished, please (a) clarify whether any structural changes

1 The Central Alignment Alternative would have the same design as the EAA, but it would be centered on the existing alignment of El Camino Real, and would affect adjacent properties on the east and west sides relatively equally

would be made to the deck or supporting structure, and (b) reconcile the retention of the bridge as is with the following statements in the DEIR which indicate that it needs to be removed or rebuilt: "the existing bridge does not completely convey the 100-year flood. Debris in the river carried during a large flood event could be trapped at the bridge, further decreasing capacity. Debris and flood flows could also damage the gas pipeline mounted on the bridge. Therefore, the entire bridge should be raised above the 100-year flood level" (page 1-4).

4. We would like to discuss with the City the possibility of (a) extending the existing MHPA designation along the San Dieguito River west of El Camino Real to the reach of the River east of El Camino Real (*i.e.*, so that the MHPA to the east of El Camino Real includes both the River and Gonzales Canyon), (b) developing and preparing Area Specific Management Directives for the clapper rail within this reach of the River, and (c) ensuring adequate funding to manage for this species. We may determine such measures to be necessary (in addition to other mitigation measures) if we are unable to determine during our consultation whether the project will result in significant indirect effects to the clapper rail.

Need to Revise the DEIR and Recirculate it for Public Review

5. Without sufficient information to support the conclusion, the DEIR concludes that there would be no project-related direct impacts on the clapper rail. As to indirect impacts on the species, the DEIR provides no discussion or analysis, but states, "potential indirect impacts to sensitive wildlife species would be significant but mitigable." The DEIR correctly states, "it is anticipated that ...[the Wildlife Agencies] will require further assessment and documentation of the potential project impacts" on the clapper rail. However, since the indirect impacts alone on the clapper rail may be significant (even with mitigation), the lack of any analysis in the DEIR for these impacts, with the exception of the direct loss of occupied habitat, undermines the basic purposes of CEQA. These purposes include, but are not limited to the following: (a) informing governmental decision-makers and the public about the potential, significant environmental effects of proposed activities; (b) identifying the ways that environmental damage can be avoided or significantly reduced; and (c) preventing significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible [CEQA Guidelines, section 15002(a)]. Deferring a thorough analysis of the direct and indirect impacts on the species until further consultation with the Wildlife Agencies is inappropriate. Given the protected status of the clapper rail and the importance of this population as a whole (see comment #7), the clapper rails within the project's area of potential effect warrant a thorough impact analysis and full mitigation for all significant impacts, both of which the DEIR lacks.

Based on the foregoing and ensuing comments and recommendations, we recommend that the information provided by the City to the Wildlife Agencies upon our request during the course of our consultation, be included in a revised EIR to be recirculated prior to certification for public review pursuant to Section 15088.5 of the CEQA Guidelines. This would be particularly appropriate, for example, if the consultation reveals a feasible project alternative or mitigation measures considerably different from those previously analyzed that would clearly lessen the environmental impacts of the project, but the City declines to adopt them [CEQA Guidelines, Section 15088.5(a)(3)]. While it is common for consultations with the Wildlife Agencies to generate a level of detail (on project impacts and mitigation) not typically expected of or provided by CEQA documents, this recommendation derives from the lack of basic impact analyses in the DEIR, analyses needed to conform to CEQA. The revisions to the DEIR to be recirculated should reflect the impacts discussed during the consultation and provide (a) updated analyses of the project-related biological impacts for each alternative, and (b) additional measures necessary to mitigate the impacts to a level less than significant, including modifications to the proposed wetland mitigation.

6. Due to the high probability of project-related adverse effects to several pairs of clapper rails, the proposed loss of clapper rail habitat (including the southern willow scrub and the mulefat scrub adjacent to the occupied marsh - - see comment #9) should be offset prior to commencement of the project components that would result in the loss. The creation and enhancement of clapper rail habitat will take a number of years to mature and thus provide the basic constituent elements for this species (*e.g.*, cover, prey, refuge etc.). Therefore, it is imperative to the continued success and survival of clapper rails in the area that compensatory creation and enhancement occur prior to the destruction of their habitat to minimize the temporal loss of its functions and values. Ideally, this would occur at least two growing seasons prior to project-related impacts.[2]

DURING CONSTRUCTION

Light-footed Clapper Rail (clapper rail)

7. During a focused survey conducted in 2006, an estimated 31 pairs of clapper rail were detected within the approximately mile-long reach of the San Dieguito River between El Camino Real and the Morgan Run Gold Course upstream of the bridge to the east (Zembal *et al.*, 2006). Citing John Konecny as the source of the information, the report entitled *Natural Environment Study Report for the El Camino Real Road/Bridge Widening Project* (Tierra Environmental Services, June 13, 2006; biology report) indicates that there were also four to five pairs reported west of El Camino Real in 2006, while another source informed the Department that there were one pair and three single males west of the bridge (D. Zembal, pers. comm., electronic mail, April 3, 2006).

   The biology report suggests that results of surveys conducted east of El Camino Real since 2004 indicate that the clapper rail population in the area has expanded rapidly. We are not aware of data that demonstrates that the population east of El Camino Real has expanded rapidly. It is not known how long or at what density clapper rails have occupied the reach of the San Dieguito River east of El Camino Real.[3] Our understanding is that formal

2 In an electronic mail dated November, 28, 2004, to Katherine Hon and copied to several people, the Department stated, "given that the project is likely to potentially affect the clapper rail, it would be best to have the mitigation in place prior to commencement of construction."

3 As described in the report entitled *Status and Distribution of The Light-footed Clapper Rail in California, 2006* (Zembal e al., 2006), from 2004 through 2006, the surveys encompassed progressively longer reaches of the River, until in 2006, they incorporated occupied habitat not previously surveyed southeast of the Morgan Run Golf Course. Clapper rails may have been in this reach of the River prior to its re-alignment for the Fairbanks Ranch Country Club (FRCC). The 1981

focused surveys for the clapper rail were not conducted along the reach of the San Dieguito River east of El Camino Real prior to 2004. This recently discovered subpopulation of clapper rail is the third largest in the state and the largest ever recorded in a freshwater marsh (Zembal *et al.*, 2006). It is critical that the population be protected. The following comments address some of our concerns about impacts on the clapper rail during construction.

a. We are concerned about the negative impacts on the clapper rail that might occur during the construction of the project, both during and outside of the species' breeding season. Such impacts include, but are not limited to, (a) direct impacts such as injury or death of a clapper rail, and (b) indirect impacts such as (i) disruption of breeding activities, (ii) disruption of daily activities such as foraging, (iii) displacement, (iv) resultant reduced genetic diversity among the clapper rails within the area, and (v) reduced productivity among the displaced individuals in subsequent breeding season(s). As the DEIR mentioned none of these, much less analyzed them, it will be necessary to discuss these in depth during the future consultation, and address them in the revised and recirculated DEIR.

b. As the clapper rail is a resident species, we do not believe that the measures proposed for implementation during project construction are adequate to avoid impacts on the species either during or outside of the breeding season. And, depending on the definition of "river corridor," the proposed prohibition of construction activities within the river corridor during the breeding season may not be sufficient to protect the clapper rail from significant impacts.

c. The potential effects, if any, on the clapper rail of the ground vibrations from driving the piles to a depth of 90 feet requires consideration.

d. Construction-related noise is one aspect of the construction of concern to us, and the proposed noise controls during the breeding season may not be sufficient to protect the clapper rail from significant impacts. The DEIR indicates that peak noise levels may be 85 to 90 A-weighted decibels (dBA) at a distance of 50 feet during most construction activities, and hourly average noise levels at 50 feet from the edge of the work area would be anticipated to be 70 to 80 dBA Leq.[4] According to the DEIR, construction noise levels at 50 feet of approximately 80 dBA Leq would be expected from work on the roadway, and noise levels of approximately 86 dBA Leq would be expected from work on the bridge. The distance to the threshold noise level of 60 dBA Leq would be a radius of 500 feet from a point source on the roadway, and 1,000 feet from a point source on the bridge. Appropriately, the DEIR prohibits construction activities that would generate 60 dBA Leq within the noise contour of 1,000 feet of the river during the avian breeding season. We wish to discuss the construction-related

Final Environmental Impact Report for the FRCC does not include them in the list of species within the River, but the species list is clearly incomplete.

4 Examples of common outdoor noise levels are (a) 80 dBA at a distance of 50 feet from a diesel truck going 50 miles per hour, (b) 100 dBA at a distance of 3 feet from a gas lawn mower, and (c) 110 dBA at a distance of 1,000 feet from a jet fly-over (DEIR, pages 3.11-1 and 3.11-2).

noise during the consultation, specifically, (a) what "river corridor" means, (b) what peak levels might occur within the 60 dBA Leq standard, (c) noise generated by the pile driving to a depth of 90 feet, and duration of the noise, and (d) what measures will be necessary to adequately attenuate noise levels outside of the breeding season.

e. We recognize that a biological advantage to the EAA is that its construction would span two breeding seasons, while the construction of the other build alternatives would span three breeding seasons. This aspect of the EAA, relative to the other build alternatives, would be beneficial to the clapper rail and other sensitive species in the project vicinity. However, we wish to further discuss with the City the Central Alignment Alternative (CAA), and the expected duration of construction of the bridge and the road segments north and south of the bridge for both the EAA and the CAA.

f. The DEIR requires that the biologist responsible for construction monitoring have a minimum of a Bachelor's degree in biology, botany, or related science and will have at least two years of experience in monitoring native habitat restoration projects in southern California. We request that the biologist have experience in surveying for clapper rail and be knowledgeable about the species' requirements and behaviors.

g. The breeding season for the clapper rail should be considered to be February 15 through September 30.

Habitat Losses

8. In the event that the EAA remains the City's preferred alternative and the one that is built, the Wildlife Agencies would like to discuss the possibility of reducing its width, and thereby reduce it biological impacts. As the City proposes it, the EAA would retain the existing bridge, which would be dedicated to non-vehicular use as a trail for pedestrians, equestrians, and bicyclists. The new bridge is also proposed to have pedestrian walkways and bike lanes. While we understand that some space is necessary to accommodate drivers of broken-down vehicles, it is not evident that all the space provided is necessary. Nor is it clear why, given the proposed trail on the existing roadway and bridge, bike lanes are proposed for the new bridge and roadway. Eliminating the non-vehicular amenities (*i.e.*, bike lanes) from the new bridge would reduce its footprint and reduce its direct impacts to the habitats and species present.

9. The Wildlife Agencies believe that the DEIR underestimates the project-related loss of clapper rail habitat. Table 3.12-8 on page 3.12-44 of the DEIR indicates that the EAA would result in the loss of 0.77 acre of clapper rail habitat, comprised solely of disturbed coastal brackish marsh. When seeking refuge from high flows (Zembal *et al.* 1989, Shuford 1993) or seeking out alternative forage (*e.g.*, grasshoppers), clapper rails will use riparian and upland habitat adjacent to the habitats supporting the emergent vegetation in which they reside. Although used infrequently, this habitat may be extremely important at reducing mortality during high flows. It is possible that, during the heavy flows of the 2004-2005 rainy season, the clapper rails in the marsh to the east of El Camino Real used the adjacent habitat along the northern bank of the San Dieguito River to escape the flows. Because such habitat is important to clapper rails we consider it as clapper rail habitat.

Therefore, the southern willow scrub (0.10 acre), and the disturbed mulefat scrub (0.40) within the EAA alignment and adjacent to the occupied disturbed coastal brackish marsh should be added to the 0.77 acre of clapper rail habitat (*i.e.*, the total should be 1.27 acres).

10. It is not clear from the DEIR whether the impacts from the proposed 500 feet of buried bank protection on the eastern side of the bridge are included in the impact analysis. Figure 3.12-5 depicts the outline of impacts associated with the EAA; however, impacts from the bank protection are not shown. Please revise all applicable figures to reflect the location of the bank protection, analyze the acreage and habitat types affected by the bank protection, and provide appropriate mitigation.

11. In a May 12, 2004, electronic mail to Katherine Hon and copied to several people, the Department inquired as to the status of the CEQA review for the JPA's undercrossing for equestrian use. The electronic mail stated the following.

> *If it has not yet gone through CEQA, it would be appropriate for the Bridge Replacement Project and the equestrian trail (at least the portion of it within the area of potential effect of the Bridge Replacement Project) to be considered under the same CEQA analysis (and NEPA if the trail is funded by federal sources). Since the design of the proposed bridge is affected by the need for the undercrossing (and possibly vice versa), these projects are definitely related and warrant concurrent CEQA analysis per Section 15003(h) of the CEQA Guidelines which states, "The lead agency must consider the whole of an action, not simply its constituent parts, when determining whether it will have a significant environmental effect..." If the equestrian trail has already gone through CEQA, the CEQA/NEPA document for the Bridge Replacement Project should discuss what, if any, aspects of the proposed bridge the approved alignment/design of the trail dictates.*

We have no record of receiving a response to this electronic mail. Our concerns about piecmealing remain as it is not clear whether the direct losses of sensitive habitats, or any related impacts (see comment #16), from the proposed multi-use trail under the bridge were accounted for in the impact analysis. Please provide a quantification of the habitat losses and, if they had not already been accounted for, increase the mitigation obligations accordingly.

12. The DEIR discusses the parcels that the project may affect (page 3.1-3). One of these (APN 302-090-28, PIF# 10) is a parcel whose development was the subject of a CEQA document (mitigated negative declaration, MND) the City circulated in December of 2004. The project name was Villa Paraiso and the Wildlife Agencies commented on the MND. Our understanding is that approval of the project was conditioned on meeting several requirements to protect the sensitive wetlands on site. Please explain (a) how, if at all, the widening of Via de La Valle would affect the ability of the Villa Paraiso project to meet its obligations to enhance and protect the on-site wetlands and/or (b) how the widening of Via de La Valle would exacerbate the impacts for which the measures to protect wetlands were imposed, and (c) how the detrimental effects would be mitigated.

POST-CONSTRUCTION

13. The two primary concerns we have about the post-construction aspects of the project are (a) the potential for short- or long-term type change or diminution in value of clapper rail habitat resulting from project-related hydrologic and hydraulic effects, and (b) the adequacy of the proposed wetland mitigation areas and plans.[5] Though hydrologic and hydraulic studies were conducted for the project, the analyses therein were not used to assess potential impacts on clapper rail habitat. Nor does the DEIR provide such an assessment, which we requested in our NOP comment letter. In an effort to determine whether the studies provide sufficient information to make such an assessment, Senior Engineering Geologist (Kris Vyverberg) and Associate Hydraulic Engineer (Marjorie Caisley), both with the Department, reviewed the document entitled *Hydraulic Study for El Camino Real Bridge Project on the San Dieguito River* (Rick Engineering Company, April 2006; Hydraulic Study) and pertinent excerpts from the DEIR. Their review generated several comments and questions, responses to which will influence our determination as to the adequacy of the proposed locations and designs of the wetland mitigation areas, and as to whether the Eastern Alternative or the Central Alignment Alternative would be less biologically damaging.

    In general, Ms. Vyverberg and Ms. Caisley found that the hydraulic study does not provide sufficient information or analysis for a meaningful evaluation of the environmental consequences of the proposed project. More specifically, in the absence of the information outlined below, the impact of this project on the habitat supporting the clapper rail population cannot be determined within the project's area of potential effect. Our review suggests that there could be changes in water depths, water velocities, and the physical form of the channel all of which collectively define the physical habitat the rails depend on. In fact, the DEIR indicates that upstream of the proposed bridge, 100-year velocities would be higher than with the current condition of the River. The information necessary to determine the magnitude of change to this habitat and the associated potential effects to the clapper rail has yet to be provided; and in its absence, the proposed project should be assumed to be a threat to the population. Specifically, the additional information and analyses required for a meaningful evaluation of the environmental consequences of the proposed project, and to assess the adequacy of the proposed wetland mitigation area, are outlined below.[6]

    a. *An explanation is needed for why the piers of the existing bridge are modeled in an unconventional manner and differently from the method used for the new bridge.* The piers have been coded as ground points rather than as bridge piers [Appendix A, HEC-RAS Output for the Existing Conditions, page 4, figure for River Station (RS) 2.614, and pages 15-16, HEC-RAS Project Data, Hydraulic Study, April 2006]. Accounting for the hydraulic influence of piers in this way likely results in greater channel

5 Though we provide these comments in the Post-Construction section, the mitigation for the losses of clapper rail habitat should occur prior to the completion of project construction, as addressed in comment #6.

6 Ms. Vyverberg and Ms. Caisley did not have the entire DEIR available for review. Their comments are provided here in their entirety, but there may be information that they request that is available in the DEIR.

roughness values, reduced channel capacity, and increased water surface elevations than would be expected from a conventional approach.

b. *A discussion is needed on the discrepancy between upstream locations and the water surface elevations (WSE) at section 2.439.* The WSE is higher downstream at section 2.439 than at the two sections immediately upstream for the 50- and 100-year recurrence interval events (HEC-RAS Work Map for the Preferred Alternative, Map Pocket 2, Hydraulic Study, Appendix B, HES-RAS Output for the Preferred Alternative, page 3, River Stations 2.59, 2.524, and 2.439). This may be an error in modeling or perhaps an incorrect accounting of flow exiting the channel over the weir and into the wetland area.

c. *Clarification is needed on the ineffective flow area selected for the proposed conditions downstream of the new bridge in the wetland mitigation area.* The ineffective flow area on the left bank of RS 2.439 appears to be incorrectly located at station 4220; the berm is actually located at station 4620 (Appendix B, HEC-RAS Output for the Preferred Alternative, page 7, RS 2.439, and HEC-RAS Work Map for the Preferred Alternative, Map Pocket 2, Hydraulic Study). Ineffective flow boundaries define bodies of ponded or recirculating water (*e.g.*, eddies downstream of structures) that are not contributing in a meaningful way to the overall conveyance of the flow downstream. Locating the ineffective flow boundary at station 4220 suggests graphically and hydraulically that the effective channel cross section is wider than it actually is. The net result of using a wider channel than actually exists is artificially improved hydraulics through and downstream of the proposed bridge.

d. *The following information is needed on the hydraulic performance of the proposed weir structures, which otherwise cannot be evaluated from the information provided*:

   (i) the water surface elevations in the wetland at the range of flow events being considered (*i.e.*, low flow - undefined in the report, and the 10-, 20-, 50-, and 100-year recurrence interval events);

   (ii) clarification on whether the weir coefficient in the equations was adjusted to reflect that the weirs are submerged at the 50-and 100-year recurrence interval flow events;

   (iii) clarification on whether the energy between the flow over the weir and the flow remaining in the channel were balanced when determining how much flow was left in the channel; and,

   (iv) clarification on which of the two values reported for weir flow is correct, and a discussion on the difference between the values as determined by the Fluvial-12 model [*e.g.*, 7,864 cubic feet per second (cfs) at the peak 100-year flood discharge] versus those determined using the HEC-RAS model (9,385 cfs, Appendix B, page 3, Reach-1, RS 2.59).

e. *The following information is needed on the design and hydraulic function of the wetland mitigation area, the effectiveness of which cannot be evaluated otherwise:*

(i) a discussion on the discrepancy between the design of the inlet to the wetland mitigation area as specified in the Hydraulic Study [*i.e.*, six 5-foot reinforced concrete pipe (RCP) culverts versus the single 3-foot RCP culvert specified in the main body of the report (respectively, Attachment 2, page 14 of the Hydraulic Study versus Section 5, Brackish Marsh Mitigation Area Hydraulics, paragraph 2, page 10 and Figure 3.12-6, El Camino Real Mitigation Concept Plan];

(ii) the location of the River at any given flow relative to the location of the proposed inlet;

(iii) the flow event at which the inlet becomes active and water begins to flow into the wetland area;

(iv) the range of flows over which the wetland is inundated, to what depths, and for what period of time;

(v) the typical water surface elevations in the wetland under normal, non-flood conditions; and,

(vi) the effect that the radical change in the recommended inlet size will have on wetland operation and function.

f. *A complete scour analysis is needed of the proposed structures on bed and bank erosion.* The hydraulic study uses a proprietary model (Fluvial-12, Chang 1988) not generally available to us to evaluate changes in general stream scour conditions associated with the proposed project. No evaluation of the local scour associated with local obstructions to flow by a bridge pier or abutment is provided. An evaluation of project-related impacts on bed and bank erosion and the impact of such erosion on the integrity of the physical habitat requires the following information.

(i) A transparent consideration is needed of general scour effects using a non-proprietary and standard model (such as HEC-RAS) and the methods described in Hydraulic Engineering Circular No. 18 (HEC-18, Evaluating Scour at Bridges, FHWA, 2001). HEC-18 presents the state of knowledge and practice for the design, evaluation and inspection of bridges for scour. A scour analysis using the methods in HEC-18 may also be required if the proposed project uses federal funds.

(ii) An analysis is needed that considers the project-related effects on general as well as local scour conditions, including the influence of debris and impinging flows. The DEIR indicates that the height of the bridge will be 3-feet higher than the elevation otherwise required to pass the 100-year recurrence interval (Section 2.2.11, page 2-16), but neither the DEIR nor the hydraulic study address whether the height of the water surface elevation includes any consideration of the confounding influence of flood debris on freeboard calculations.

g. *Consideration is needed of the potential influence of tidal flux on the hydraulic performance of the proposed structure and river channel.* Although this may have been considered and determined to be of no engineering or biological consequence, there is no mention in the various project documents of any consideration given to the effect (if any) of storm tides on the proposed design.

h. *Consideration is needed of a project alternative that includes a longer bridge span.* The span length of the proposed bridge is essentially the same width as the existing bridge (355 feet and 340 feet, respectively) even though the possible effective width of a new structure located 75 feet upstream could be 490 feet long. The proposed span length results in an undersized bridge opening and higher water velocities and stream channel scour that the project proponents address by over-steepening the stream banks to increase the capacity beneath the bridge. Lengthening the bridge span will provide a larger capacity opening beneath the bridge, will reduce local scour, eliminate the need to line the channel beneath the bridge with rock, eliminate the need for rip rap on the banks, and allow the banks beneath the bridge to be laid back to a slope flatter than the 1.5:1 slope proposed.

Locations of the Proposed Wetland Mitigation

14. One of the main subjects of discussion during the meetings the City held on the proposed project was the mitigation for the project-related losses of wetlands. The locations of the proposed mitigation for the loss of southern willow scrub and mulefat scrub (*i.e.*, along the southern bank of the River, just downstream of El Camino Real) appear acceptable as the mitigation that occurs there may adequately meet the compensation requirements for losses of acreage, functions, and values (*e.g.*, providing vireo habitat and fringe clapper rail habitat). However, though the gaps in the habitat have been lessened based on previous discussions, it is not clear whether these areas would remain in their current state (*i.e.*, disturbed and agriculture) or if there can be further modifications to actively restore them to provide greater contiguity to the other proposed mitigation areas.

The brackish marsh habitat proposed as mitigation would occur southwest of the bridge and result in an 11.35-acre area being converted from tomato fields. The area would be surrounded on two sides (north and west) by berms approximately 14 feet tall (final grade) with 10-foot wide tops. A 100-foot buffer of upland vegetation and the existing El Camino Real would create the eastern and southern boundaries. The area would receive fresh water from the San Dieguito River during lesser flows via a 36-inch corrugated pipe, and during larger events a spillway would allow for overflow into the area. The enclosed cell surrounded by berms and roadway on all sides would be an artificial system with little biological connectivity. A ramp is proposed for clapper rail access across the berm; however, clapper rail usage of this type of access is unknown.

The likelihood of the success of creating and managing brackish marsh habitat in an area which does not experience tidal influence and relies on saline soils to mimic salt water presence is questionable. There is a high potential for type conversion as the salts leach from the soils over time. The project area does not experience tidal influence due to (a) historical changes in the watercourse itself (primarily channelization), (b) year-round freshwater flows (versus primarily in the winter only), and (c) frequent blockage of the River's mouth. The brackish marsh creation area would receive flows (freshwater only) after precipitation events large enough to allow flow into the corrugated metal pipe and over the inlet weir. Brackish and salt marsh habitat is regularly inundated in sequence with the tidal prism at some point in time, whereas tidal influence may never reach this far upstream again.

San Dieguito River will become further channelized with the presence of a berm on the southern bank of the River and the construction of a larger bridge within the 100-year floodplain. Considerable channelization has already occurred in this system; as the DEIR states, "the area was generally wetlands (swamps, and overflow lands and tidelands) and a braided river channel." Channelization of watercourses may provide a human benefit by temporarily alleviating flooding and loss of property, but throughout the country this practice has resulted in inestimable losses of wetland habitats, functions, and values. Restoration of riparian corridors almost always involves reconnecting the floodplain/ geomorphology as the arteries of the system. The proposed artificial means of creation may provide habitat for a certain target species; however, as a whole, the River system will be further degraded.

As to the suitability of the proposed location of the mitigation for the loss of clapper rail nesting habitat, the transmission towers and lines within the utility corridor adjacent to the western boundary of the mitigation area must be considered. They likely serve as perches for raptors which prey on clapper rail chicks, which also renders the mitigation area inappropriate.[7] The presence of the utility corridor, especially the underground lines, could hamper any wetland restoration efforts by leaving a barrier (*i.e.*, a berm to protect the underground lines) across the floodplain after excavation for the restoration. Removal or other means of lessening the impacts of the utility corridor must be considered if high value and naturally functioning wetlands in this area are to be restored.

The high salt marsh mitigation area is located west of the proposed brackish marsh site. The two sites are separated by SDG&E's right-of-way. The DEIR provides very little information on the specifics of this mitigation site. It appears that the area would be excavated to create a 3-acre depression, but it is unclear how the area would be inundated or connected to river flow, tidal regimes, or groundwater. This mitigation area would be surrounded by agriculture, and it appears it would have no connection to the proposed or existing native habitats.

The future discussions regarding the questions above on the hydraulic and hydrologic studies should inform us about certain aspects of concern to us about these mitigation plans. In addition to other mitigation options mentioned in this letter, mitigation

7 The JPA property is split diagonally by a 150-foot wide utility corridor running southeast to northwest between El Camino Real and Via de la Valle. The utility corridor is controlled by San Diego Gas and Electric (SDG&E). In addition to the high voltage steel transmission towers are within the utility corridor above ground, there are three pipelines below ground. The pipelines carry fuel and high-pressure gas.

approaches that better complement the ongoing restoration efforts in San Dieguito Lagoon/River should be considered.

15. The Wildlife Agencies have repeatedly indicated that some of the mitigation for the project-related loss of wetlands and clapper rail habitat should occur along the northern bank of the San Dieguito River starting immediately upstream of the existing bridge, and we have requested that any outstanding issues regarding the previously required mitigation in this area be resolved before the City proceeds with this project.

    Per the 1981 Environmental Impact Report (EIR) for the Fairbanks Ranch Country Club (FRCC), part of the FRCC's mitigation obligation was to create an area of riparian vegetation along the northern bank of the San Dieguito River. The approximately 1700-foot long mitigation area along the bank was to have averaged 250-350 feet in width, occupying over nine acres.[8] This area is roughly depicted in the figure at the end of this Enclosure. During the April 4, 2005, meeting held by the City, the City explained that its 26-year lease of the City lands to the Polo Club Fields (*i.e.*, the leasehold adjacent to the northern bank of the San Dieguito River) which commenced in 1986 does not reflect the mitigation on the property referenced in the FRCC EIR. The City also noted that the failure of FRCC to carry out the required mitigation for the 1981 project is a code enforcement issue, and that the City would investigate it. We would like to discuss what actions, if any, the City has made to resolve this matter.[9]

    We understand that the projected increase in the 100-year velocities upstream of the proposed bridge require stabilization of the north bank of the San Dieguito River, and that this may impair efforts to provide mitigation along the north bank. However, we wish to further discuss this potential mitigation location with the City. We also request clarification on the following statement in the DEIR (page 3.7-27, Mitigation Measure 7.1), "the slope would be refilled and re-contoured and revegetated with native coastal sage scrub plant materials." This seems to conflict with information that the proposed riprap area would not be vegetated.

16. As addressed in comment #11, it is not apparent from the DEIR that the City analyzed the indirect (or any) impacts from the JPA's proposed trail under the bridge. Among the related subjects that we will discuss during the consultation will be (a) relocating the trail, (b) the impacts of the trail users on the clapper rail and other sensitive species in the San

8 This does not include FRCC's entire mitigation obligation north of the San Dieguito River. The riparian vegetation was to have extended farther upstream by at least double the 1700-foot reach, and was to have reached a maximum width of approximately 500 feet.

9 The minutes from the April 4, 2006, meeting correctly reflect that the Wildlife Agencies indicated that neither agency has the authority to require the City to select a particular mitigation site if several are adequate. The minutes go on to state, "If it can be demonstrated that emergent marsh can be established on the JPA site, then that site is acceptable for mitigation for El Camino Real Road/Bridge Project." We do not agree with this because the mitigation for the establishment alone of the marsh will not necessarily mitigate for the loss of clapper rail habitat; there are other factors involved. Also of note from the minutes is the following statement, "The Coastal Commission said that if there is biological benefit to mitigating outside of the Coastal Zone, they would consider such a plan." The Coastal Zone extends to El Camino Real (*i.e.*, it does not include the potential mitigation area to the east of El Camino Real).

Dieguito River, (c) the effects (*e.g.*, erosional runoff) of the paved trail on the downslope substrate and habitat, (d) the management of the horse manure, (e) cowbirds, and (f) measures to adequately mitigate for these impacts.

17. Another alternative to consider as part of the mitigation to enhance the existing clapper rail habitat would be to provide a transition of wetland (*e.g.*, southern willow scrub, mule fat scrub) to upland habitat along the southern bank of the River east of El Camino Real. The City's preferred alternative at the time of the April 10, 2002, meeting proposed to widen the river by excavating approximately 8.7 acres of upland along its southern bank. The project then proposed to widen the river by up to 100 feet for a distance of 800 feet upstream of (i.e., east of) El Camino Real and up to 300 feet for 1,000 feet downstream of the road. Project construction is proposed to occur in phases. It was subsequently determined that this extensive widening was not necessary to achieve no net rise in the 100-year water surface elevation, and the Wildlife Agencies expressed concern about the scale of the widening and its potential impacts on the extant habitat. The point is that if it was previously feasible to use some of the property along the southern bank of the San Dieguito River for this project, it must still be feasible to do so. A widening of 100 by 800 feet would occupy approximately 1.84 acres. We would like to discuss the possibility of incorporating this area into the mitigation by laying back (not widening the bed of the River) the slope and planting it with appropriate vegetation. This would provide an extension to the clapper rail habitat and an area for their use as a refugium and/or foraging.

Nature of the Proposed Wetland Mitigation

18. The DEIR states (and the City has explained to us before), "no sites for potential enhancement of coastal wetland habitat were found in the immediate project vicinity." Therefore, the City proposes to provide a considerable excess of creation of wetland habitat than will likely be required to compensate for the project-related losses. Because of our concerns about the proposed wetland creation, we requested that the City further investigate the enhancement opportunities within the San Dieguito River that the City may not have considered. We did not find evidence in the DEIR that the City had done so. We request again that the City consider opportunities for long-term / in-perpetuity invasive plant removal upstream of the existing bridge between the bridge and Morgan Run golf course, or beyond (at the first occurrence of invasive plants). We believe that both FRCC and MRGC are obligated to remove invasive plants, but we do not know the duration or aerial extent of their obligations. We request that the City investigate the terms of these obligations. If they do not include all the areas within the entire reach of the San Dieguito River between the bridge and the MRGC infested with invasive species and/or if the obligations are short-term, then long-term exotic species removal in those areas could partially or wholly replace excess creation proposed for the enhancement component of the mitigation, and could prove more ecologically beneficial (for wetland functions, including clapper rail needs) than the proposed creation of habitat.

19. Included in the Planting Plan for Riparian Scrub habitat are sensitive species such as San Diego marsh elder (*Iva hayesiana*) container stock and Palmer's sagewort (*Artemesia palmeri*) seed. These species are already present naturally. Therefore, to sustain the

genetic stock of these sensitive plant species, cuttings and seeds should be collected from those individuals on site and grown out at a nursery for later reintroduction during restoration activities. The locations of each species should also be documented and provided in a figure in the final EIR. Impacts to the naturally occurring specimens should be avoided and/or minimized.

20. The proposed wetland mitigation is intended to provide species specific mitigation by, for example, applying a mitigation ratio of 4:1 to the habitat occupied by the clapper rail and meeting the 4:1 ratio with creation only. The success criteria for this mitigation are based solely on the condition of the vegetation to be planted. Success criteria specific to the use of the mitigation area by the clapper rail should also be included. Absent exceptional circumstances (*e.g.*, clapper rail do not persist in the project area for reasons unrelated to the project), there must be evidence that the clapper rail uses the created habitat before it can be considered a success.

Water Quality and Noise

21. The DEIR explains that the created drainage ditches along El Camino Real and Via del la Valle would serve as best management practices (BMPs) by filtering contaminants out of the runoff from the roads. Proposed improvements to the drainage ditch would result in a trapezoidal channel 22 feet wide and 6 feet deep with the ability to handle 616 cfs (Q_{100}) from a 631-acre watershed. The alternative to this mentioned in the DEIR is an underground storm drain. Please explain how a channel of this capacity or an underground storm drain would provide water quality remediation. It is imperative that road improvements such as this one also include improvements to water quality to address concerns for the release of contaminants such as polyaromatic hydrocarbons, fecal coliform, pesticides, etc. which are regularly discharged into surface waters. We recommend that a treatment facility (*e.g.*, retention basin, vault system or an appropriately designed vegetated swale) be incorporated into the project to provide the necessary mitigation to offset the deleterious effects of storm water pollution on the sensitive species and habitats found in the river corridor. For example, research indicates that low fertility and egg-hatching success in northern populations of clapper rail may result from contaminants (Eddleman *et al.*, 1998).

We also request information on the BMPs that will be incorporated into the project design to accept flows from the bridge prior to their entry into San Dieguito River.

22. If the EAA is built, the sound of traffic will travel farther into the clapper rail habitat than it does now. We request that the City investigate and incorporate into the bridge and road design measures to dissipate the noise from traffic. For example, porous Elastic Road Surfaces (*i.e.*, asphalt-rubber) and/or noise dampening barriers could provide a reduction in noise pollution below harmful and disruptive levels.

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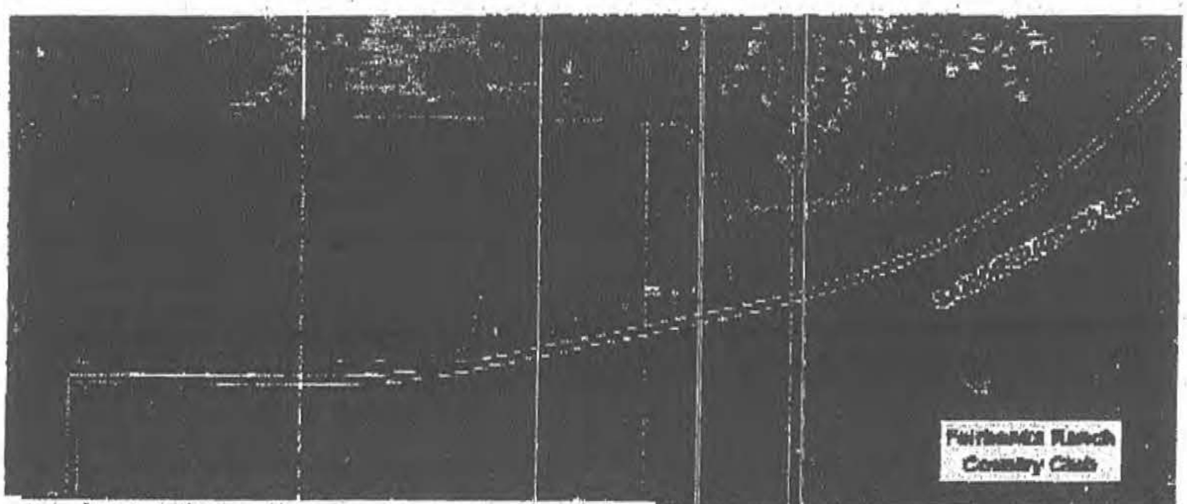
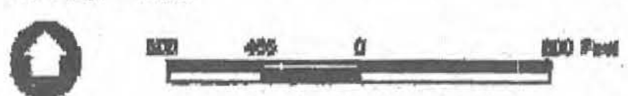
The figure below is associated with comment #15.





This image is excerpted from the DEIR for a project of the Olivenhain Municipal Water District (San Dieguito Water Storage and Project, Figure 2-1). Ignore the double yellow line.

= approximate mitigation area.

CITY OF SAN DIEGO
EL CAMINO REAL ROAD/BRIDGE PROJECT
AGENCY COORDINATION MEETING SUMMARY
OCTOBER 25, 2005

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The purpose of the meeting was to show available locations for wetlands creation and enhancement, and present the basic concepts of the wetlands mitigation plan for the project on the JPA (former Boudreau) property. The acreages of impact and mitigation needs presented reflect those of the Eastern Alignment, which is the City's Preferred

Alternative. The mitigation acreages proposed are a conservative estimate that would cover any of the alternatives.

The meeting discussion is summarized below.

DISCUSSION SUMMARY

1. **Preferred Mitigation Site.** The JPA (former Boudreau) property lies west of El Camino Real in the Coastal Zone. This property was selected by the City as the preferred mitigation site after a multiple-site, group-process evaluation, as discussed with the agencies in meetings on February 28, 2005 and April 4, 2005.

2. **Utility Corridor.** The JPA property is split diagonally by a 150-foot wide utility corridor running southeast to northwest between El Camino Real and Via de la Valle. The utility corridor is controlled by SDG&E. High voltage steel transmission towers are in the utility corridor above ground, and three pipelines are in the utility corridor below ground. The pipelines carry fuel and high-pressure gas. The pipelines are at shallow depths (top of pipes at 4 to 9.5 feet below the ground). Therefore, culverts cannot be buried in the utility corridor to hydraulically connect the east and west sides of the JPA property. After developing concepts for each side and analyzing these hydraulically, the City has selected the east side of the utility corridor for the mitigation plan. This will place the created brackish marsh as close as possible to the clapper rails east of El Camino Real.

3. **Topography and Groundwater Levels.** Based on borings drilled on the JPA site by Ninyo & Moore on June 13, 2005, the groundwater levels east of the utility corridor vary from approximately 3 to 6 feet below the existing ground surface. Based on topographic mapping, the existing agricultural fields are at elevations of 12 to 14 feet above mean sea level (msl). Therefore, the groundwater table is at an elevation of about 8 feet msl. The river bed elevation is about 3 to 5 feet msl. High tide up the San Dieguito River is at a maximum elevation of approximately 4 feet msl. Tidal influence on the mitigation site is not likely.

4. **Flooding Issues.** The JPA property is in the 100-year floodplain of the San Dieguito River. The 100-year flood elevation in this area is approximately 19 feet msl, or 5 to 7 feet above the existing ground surface of the agricultural fields. Based on historic flooding patterns of the San Dieguito River along the JPA site, if brackish marsh is planted in an area that is lowered about 3 to 6 feet to be close enough to groundwater to be sustainable, the area will be subject to damage from high floods. In greater than about the 10- to 15-year flood, high-velocity water carrying sediment would overtop the river banks and pour into the lowered wetlands area. The sediment would deposit in the depression, and erosion would occur from the fast flowing water.

5. **Protective Vegetated Berm.** In order to protect the planted wetlands from flood and sediment damage, a vegetated berm is proposed to be constructed parallel to the river along the edge of the area lowered to create brackish marsh. The berm would have a side slope of 2.5:1 on the river side and would rise 10 feet above the existing ground surface to provide 100-year flood protection of the created wetlands. The vegetated berm would be set back from the south bank of the river along the effective flow line, but would be within the 100-year floodplain. Without the berm, the lowered mitigation area would capture sediment during high flows, which would bury the planted brackish marsh and reduce sand supply to the beach downstream. JPA noted this is why the San Dieguito Lagoon Wetlands Restoration Project also has berms along the river. Their project was in litigation for 2 years over the beach sand supply issue.

6. **Inflow Weir.** A weir (lowered notch) about 250 feet long would be constructed in the eastern edge of the berm to divert a portion of high river flows into the created brackish marsh. The weir would be protected by open stabilization material such as Armorflex, which would be planted with site-appropriate vegetation. Water flowing over the weir would enter the created wetlands in a controlled fashion that would prevent erosion and sedimentation. Some of the high river flows must be allowed into the created wetlands so that upstream 100-year water surface elevations would not be increased by the vegetated berm in the floodplain.

7. **Low Flow Culverts.** Pipes would be installed through the protective vegetated berm to allow low river flows to enter the created brackish marsh. The culverts would allow flow exchanges between the river and the created brackish marsh. The bottom of the culverts would be set at an elevation of 6 feet msl, (slightly above the river bottom to prevent sediment from entering the created brackish marsh) and would allow slowly moving water to enter the area. Slowly moving water is desirable for the clapper rail.

8. **Outflow Weir.** During high flow events, flow entering the created brackish marsh through the inflow weir would exit to the west over the utility corridor. The ground surface of the utility corridor would need scour protection, which would be developed in coordination with SDG&E.

9. **Impacts.** The impacts of the Eastern Alignment Alternative, the mitigation ratios, and the mitigation required were presented in the table sent in advance of the meeting.

10. **Available Mitigation Areas and the Proposed Mitigation Concept.** The graphic sent in advance of the meeting showed where enhancement and creation would be possible. The following discussion occurred regarding the graphic:

    - The graphic shows the mitigation potential for El Camino Real without incorporating JPA's needs.

- The 22nd Ag District owns the area of the river where the 0.68 acre of brackish marsh enhancement potential is shown, and where the 0.38 acre of mule fat/southern willow scrub enhancement potential is shown. The 0.24 acre of potential riparian enhancement on the east side of the bridge may not be a viable area for enhancement for the Eastern Alignment because of future shading by the bridge. These areas are not included in the mitigation concept.

- On the east side of the utility corridor, approximately 10.8 acres would be available for brackish marsh creation behind the protective vegetated berm. This is enough area for all of the needed brackish marsh creation (5 acres), and for most of the brackish marsh enhancement (all but approximately 1 acre).

- About 2.9 acres of riparian area along the southern edge of the river could be enhanced by removal of tamarisk.

- Contiguous with the southern river edge, 4.29 acres of mule fat/southern willow scrub could be created, which is more than the acreage needed to mitigate for project impacts. However, this leaves a gap between the berm and the created riparian area that is not desirable to any of the agencies present or to the U.S. Fish and Wildlife Service, who discussed the graphic with CDFG in advance of the meeting. After a group discussion regarding what could be planted in the gap, it was decided that the area of riparian creation will be changed to close the gap.

- The riparian creation area would not meet the definition of Corps wetlands unless the area north of the berm were lowered to the depth of the river. This may not be desirable because it could change river hydraulics.

- More than 3 acres of high salt marsh could be created on the west side of the utility corridor. The area shown on the graphic will be moved to the south, to avoid property owned by CDFG.

- A 100-foot buffer is shown between the brackish marsh creation area and the western side of the proposed pedestrian walkway on widened El Camino Real. The buffer is intended to be planted with native species, likely upland types. CDFG would not want to see this buffer width reduced.

- The berm is required to protect the brackish marsh. However, mule fat is expected to easily flourish on the site without lowering the area. If out-of-kind mitigation were acceptable, the berm could be eliminated and a high ratio of riparian creation could be provided on the east side of the JPA property. CDFG noted they do want to see brackish marsh created as mitigation for the impacts to clapper rail habitat. The Coastal Commission noted they typically require 4:1 in-kind mitigation for such impacts in the Coastal Zone.

- The Coastal Commission noted they require all impacts in the Coastal Zone to be mitigated by creation, and do not allow enhancement to be counted. Impacts of the Eastern Alignment in the Coastal Zone are 0.61 acre riparian scrub and 0.96 acre coastal wetlands (brackish marsh and salt marsh), with the present Coastal Zone boundary along the eastern edge of existing El Camino Real. Impact acreages in the Coastal Zone will be provided for all alternatives in the environmental document. The City will request a boundary determination from the Coastal Commission for each alternative.

11. **Clapper Rail Movement**. Connectivity of the existing clapper rail habitat to the proposed mitigation area is critical. There are an estimated 12 pair of clapper rail between El Camino Real and Morgan Run, according to CDFG. How will the clapper rail know there is a desirable area created, and how will they get into the mitigation area created behind the berm? These questions must be answered in the environmental document.

12. **Revised Concept**. Based on the above meeting discussion, a revised concept will be prepared and provided in a separate letter to the permitting agencies. A field meeting could be arranged if the agencies decide it would be beneficial.

CITY OF SAN DIEGO
EL CAMINO REAL ROAD/BRIDGE PROJECT
AGENCY COORDINATION MEETING SUMMARY
APRIL 4, 2005

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DISCUSSION SUMMARY

1. The objective of the meeting was to follow up on questions and concerns communicated by the permitting agencies on the City's preferred mitigation site, which is the former Boudreau site purchased by the JPA (herein referred to as the "JPA site").

2. Clarifications to the February 28, 2005 agency coordination meeting notes and additional comments were received from CDFG and the USFWS, as summarized below.

   Libby Lucas with CDFG stated in a March 2, 2005 e-mail that CDFG generally agrees with the proposed mitigation ratios. However, she requested clarification on the definition of "restoration," stating that for CDFG "to consider whether restoration alone or a restoration/creation mix would meet the no-net loss requirement, we would need to know the details of the proposal." She also noted that if the term "coastal wetlands" includes the clapper rail habitat to the east of the bridge, "the proposed 4:1 creation for the loss of clapper rail habitat will be acceptable to DFG, as will be the 1:1 creation plus 3:1 enhancement (i.e., removal for non-native invasive species from the riparian area)."

In a subsequent letter to the City e-mailed on March 24, 2005, CDFG made the following additional comment on the February 28, 2005 meeting notes: "The minutes correctly reflect that CDFG indicated that the proposed 4:1 mitigation is higher that we usually see for the loss of coastal wetlands. What I meant to say is that 4:1 creation is higher than we usually see. City of San Diego requires 4:1 for coastal wetlands, but does not specify that it all be creation. As we have said in a previous e-mail, we agree with the 4:1 creation for the loss of habitat that supports the clapper rail." This letter also posed additional questions regarding the Polo Club fields as a mitigation site. These questions were the focus of the April 4, 2005 meeting.

John DiGregoria with USFWS stated the following in a March 23, 2005 e-mail: "A couple of notes from your minutes. The Service stated that there will likely be no direct injury or kill from construction equipment. However, the permanent removal of occupied habitat will constitute "take" from harm (loss of occupied habitat) and we will need to go through formal consultation with the project. The Service also supports the CDFG position regarding the Polo Fields and any outstanding issues regarding the Polo Fields needs to be closed before we move forward with this project."

3. The feasibility of the alternative alignments that affect the western edge of the Polo Club Fields leasehold was discussed. The alternatives for the road are feasible because the lease specifically allows the City to build a road and to have other utility easements over and across the property. However, taking land for mitigation is not specifically allowed in the lease, so this action would have to be negotiated separately. The lease is for 26 years. It started in 1986 and runs to the end of 2012. The lease does not include language regarding implementing mitigation on the property referenced in the 1981 Fairbanks Country Club EIR prepared for Watt Industries, the property owner at the time. A Corporation Grant Deed transferred the property to the City on October 24, 1983. The City noted that mitigation never being implemented on the Polo Club fields for the 1981 project is a code enforcement issue, and the City will investigate this issue. It was agreed by CDFG that mitigation for El Camino Real and mitigation for the 1981 Fairbanks Country Club project are two different issues. CDFG also concurred that if the road is in the lease, then the road alignments affecting the property are feasible.

4. Potential actions by Polo Club if part of the property were taken for the road and for mitigation were discussed. Caltrans emphasized that it is speculation to predict any actions on the lessee's part, and the environmental document will not speculate. City Real Estate Assets stated that with only 7 years left on the lease, it is not likely that the lessee would go to the expense of obtaining the private property to the north in order to continue operations.

5. Demolition of the existing bridge was discussed. CDFG suggested leaving the pier walls of the existing bridge in place if the Eastern Alignment Alternative, with the completely separate new bridge, is selected. The hydraulic effects of the existing bridge and other components of the river system in this location, including the rip rap blanket and existing bridge abutments, must be analyzed. USFWS noted the rip rap blanket has helped establish the emergent marsh, which is attractive to the clapper rail. The hydraulic

analysis must determine if steepening the abutments as proposed would be detrimental to the hydraulic system that supports the clapper rail. The project description must include how and when the existing bridge would be demolished. CDFG noted that we must balance river functionality with the clapper rail requirements.

6. The biological suitability of the JPA site and the Polo Club site for clapper rail mitigation was discussed. The project biologist read the following from a government annotated bibliography about clapper rail written by Dick Zembal, former USFWS expert:

> "The light-footed clapper rail is non-migratory. Once established on a territory, the birds stay throughout the year and from year to year.
>
> Local wandering, however, has been documented, with sightings of rails in winter, sometimes far inland. Whittier Narrows, 32 km from the coast, and Walnut Canyon Reservoir (Nohl Ranch Lake), 23 km from the coast, are the farthest inland sites documented thus far. The most probable explanation for winter dispersal is that young birds must seek their own territories, once the family unit breaks up at the end of breeding season."

7. Coastal Commission policy regarding mitigation for impacts in the Coastal Zone was discussed. The City's Local Coastal Program requires impacts in the Coastal Zone to be mitigated in the Coastal Zone. However, the Coastal Commission noted that state coastal requirements would be the review standard in the project area, not the City's Local Coastal Program. The Coastal Commission said that if there is biological benefit to mitigating outside of the Coastal Zone, they would consider such a plan.

8. Potential impacts to the JPA trail that is currently on the north bank of the river were discussed. If mitigation were on the Polo Club site, allowance for at least a 100-foot buffer would have to be made in addition to the width of the mitigation area. JPA noted moving the trail as far north as the property line between the private property and the Polo Club field property could be a problem for their Coast to Crest trail alignment. However, they do not have a set trail alignment east of the bridge, because they must still address how to go through the Morgan Run area.

9. Potential legal issues associated with implementing mitigation on the Polo Club site were discussed. Caltrans noted that they generally cannot condemn for mitigation land, and they must prove necessity. In this case, since the JPA site is also considered feasible, it would be difficult to prove necessity for using the Polo Club site.

10. USFWS and CDFG concluded that neither agency has the authority to require the City to select a particular mitigation site if several are adequate. If it can be demonstrated that emergent marsh can be established on the JPA site, then that site is acceptable for mitigation for El Camino Real Road/Bridge Project. Hydrologic feasibility is related to the depth of groundwater on the site, and the ability to connect to the river without affecting river hydraulics.

11. The City will pursue having borings drilled on the JPA site to determine the existing groundwater level. The City will have Dr. Chang develop and analyze a river connection. The City will also have Dr. Chang evaluate the hydraulic conditions that would occur if the existing bridge were left in place and a new bridge built to the east. Results of the feasibility and hydraulics analysis will be reported in future e-mail correspondence.

NOTE: These minutes are the preparer's understanding of the items discussed at the meeting. If discrepancies are noted, please contact the preparer within five working days of receipt.

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CITY OF SAN DIEGO
EL CAMINO REAL ROAD/BRIDGE PROJECT
AGENCY COORDINATION MEETING SUMMARY
FEBRUARY 28, 2005

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DISCUSSION SUMMARY

1. The objectives of the meeting were to obtain input and subsequent written concurrence from the permitting agencies on the following: proposed mitigation ratios, and the preferred mitigation site.

2. Detailed impacts on sensitive biological resources based on planning level GIS estimates were provided in the background information e-mailed February 24, 2005. A summary of wetland impacts handed out at the meeting is included in these notes as Table 1. Acreage differences among alternatives in terms of impacts in the river relate to assumptions about construction easements, and the planning level of the mapping. There will be more accuracy in the impact areas when detailed final design is prepared. However, the impact to disturbed coastal brackish marsh in the river is similar for the three alternatives presented: more than 0.5 acre and less than 1 acre.

TABLE 1
CITY OF SAN DIEGO
EL CAMINO REAL ROAD/BRIDGE PROJECT
WETLANDS IMPACT/MITIGATION SUMMARY
(acres)

	Central Alignment & Lower Elevation		Western Alignment		Eastern Alignment	
Vegetation Type	**Impacts**	**Proposed Mitigation**	**Impacts**	**Proposed Mitigation**	**Impacts**	**Proposed Mitigation**
Riparian Scrub	0.66	1.98	0.53	1.59	0.86	2.58
DCBM with Clapper Rail	0.86	3.44	0.63	2.52	0.77	3.08
DCBM without Clapper Rail	2.19	8.76	1.81	7.24	2.19	8.76
Salt Marsh	0.65	2.6	0.39	1.56	0.75	3.0
TOTAL	**4.36**	**16.78**	**3.36**	**12.91**	**4.57**	**17.42**

DCBM = Disturbed Coastal Brackish Marsh

3. Proposed mitigation ratios were discussed in the background information, summarized in the meeting agenda, and are repeated below.

Riparian Scrub – 3:1 overall
1:1 on-site restoration/off-site creation
2:1 enhancement

Coastal Wetlands – 4:1 overall
4:1 creation for clapper rail habitat
1:1 creation plus 3:1 enhancement for non-clapper rail habitat

Coastal Sage Scrub
1:1 contribution to City's Habitat Acquisition Fund

These ratios were developed by the Project Biologist (Chris Nordby with Tierra Environmental Services) as a synthesis of the CDFG and other agency guidance (1:1 for no net loss) and the City's Environmentally Sensitive Lands guidance (4:1 for coastal wetlands).

4. The agencies agreed no-net-loss is typically required, and the proposed 1:1 creation (or restoration where appropriate) meets this requirement. The Corps stated the proposed ratios are adequate. USFWS noted they will defer to the Corps on the issue of mitigation ratios. The Regional Board noted the 1:1 ratio is acceptable, and the 4:1 ratio is more than adequate for Regional Board's needs. CDFG stated that the 1600 representative, who was not in attendance, would have to review the proposed ratios. The attending CDFG representative said CDFG typically requires no net loss (or 1:1), and the proposed 4:1 ratio is higher than they typically see. However, the presence of clapper rail in the river is a special circumstance that must be considered.

5. USFWS stated that due to the temporal nature of the impacts, "temporary" impacts should be considered permanent and mitigated as such.

6. The required timing for accomplishment of mitigation was discussed. NOAA noted that mitigation needs to be accomplished before construction occurs. The mitigation must be functionally equivalent to what is lost. Caltrans and the City noted the proposed ratios incorporate an assumption that mitigation would be installed concurrently with the construction project, and having the wetlands creation in place a year before the proposed construction start time of September 2007 is not possible. The mitigation must be included in the environmental and permitting processes for entire project. The earliest the CEQA/NEPA process can be expected to be completed is the beginning of 2006, and permits would probably require another 6 months after that. CDFG noted ratios can decrease if mitigation is in place before the actual disturbance.

7. Construction timing and duration were discussed. A handout presenting construction activities and timing for two basic types of bridges is included in these meeting notes as Table 2. The single-stage bridge applies to the Eastern Alignment only, which is separated from the existing bridge and road to the north. All other alignment alternatives would require a multiple-stage bridge as only half could be built at a time.

8. As Table 2 indicates, no construction in the river is proposed during the breeding season. USFWS noted then there shouldn't be take of clapper rail, but there will be a temporary loss of habitat. Biological monitoring will be required during construction.

9. The City's preferred mitigation site is the former Boudreau site (tomato fields west of El Camino Real), now owned by the San Dieguito River Park JPA. The JPA noted they support the City's proposal to implement mitigation on this site. The City would not have to pay for the use of the land, but the JPA would have to be reimbursed for maintenance. The City's El Camino Real project would have to include CEQA/NEPA clearance for the mitigation on the site, and would have to obtain the needed permits.

TABLE 2
CITY OF SAN DIEGO
EL CAMINO REAL ROAD/BRIDGE PROJECT
CONSTRUCTION DURATION SUMMARY

Construction/Breeding Season	**Single-Stage Bridge Construction Activity**	**Multiple-Stage Bridge Construction Activity**
	(Eastern Alignment only)	***(All other alternatives)***
Construction Period #1 Sept. 2007-Feb. 2008	Construct bridge substructure (piles & columns)	Construct substructure and falsework for half of bridge
Breeding Season #1 *Feb. 2008-Sept. 2008*	*No Construction*	*Construct Via de la Valle and half of El Camino Real where possible*
Construction Period #2 Sept. 2008-Feb. 2009	Construct bridge superstructure (falsework, soffit, deck)	Complete superstructure and surface for half of bridge, complete half of El Camino Real; transition traffic, demolish existing bridge
Breeding Season #2 *Feb. 2009-Sept. 2009*	*Construct along Via de la Valle*	*No Construction*
Construction Period #3 Sept. 2009-Feb. 2010	Install bridge surface features (sidewalk, barrier, handrail); construct El Camino Real; transition traffic; demolish existing bridge at any acceptable time in the future	Construct substructure and falsework for other half of bridge
Breeding Season #3 *Feb. 2010-Sept. 2010*		*Begin construction of other half of El Camino Real where possible*
Construction Period #4 Sept. 2010-Feb. 2011		Complete superstructure and surface for other half of bridge, complete other half of El Camino Real; transition traffic
TOTAL CONSTRUCTION DURATION	**~2.5 years**	**~3.5 years**
BREEDING SEASONS SPANNED	**Two**	**Three**

10. Dr. Chang noted that a hydraulic connection to the river to feed the wetlands created on JPA's "Boudreau" site would have to be very carefully designed, but it would be possible to accomplish the connection without having an adverse effect on river flow and sediment flow.

11. The agencies agreed the JPA "Boudreau" site is a suitable location for mitigation.

12. CDFG noted they would prefer mitigation be accomplished on the Polo Club fields, as this location, being east of the bridge, is closer to the currently occupied clapper rail habitat in the river. Also, CDFG research indicates the area of the Polo Club fields was supposed to be restored in the past, and the JPA's "Boudreau" site is already committed to eventual restoration.

13. The City noted that the current lease with the Polo Club expires in 2012, and removing up to 16 acres for mitigation related to the El Camino Real Bridge project could generate the need to compensate the lessee or replace the lost acreage for the Polo Club perhaps by acquiring the Hu property to the north, filling that land and amending the lease to include the replacement area. The City's environmental consultant emphasized including such a proposal in the EIR/EA would substantially increase the wetlands impacts to salt marsh, and drive the environmental process into NEPA/404. The project biologist noted clapper rail are under the bridge, and probably originally came from downstream, so the birds could move west to the JPA "Boudreau" site.

14. FHWA suggested a matrix be prepared to compare the two mitigation sites, and this information distributed via e-mail to see if a consensus can be reached. The City and CDFG should investigate previous Streambed Alteration Agreements to determine if all commitments have been met.

15. A comparison summary will be prepared, and a meeting date will be arranged for the end of March. If consensus is reached on the mitigation site, the next topic for agreement will be the preferred alignment.

NOTE: These minutes are the preparer's understanding of the items discussed at the meeting. If discrepancies are noted, please contact the preparer within five working days of receipt.

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Sent: Monday, November 15, 2004 8:40 AM
Attach: El Camino Meeting Notes Mitigation 10-28-04.DOC; ElCaminoRestSites.pdf
Subject: El Camino Real Initial Mitigation Site Planning

Hello Permitting Agencies and Interested Parties - Based on guidance from the Permitting Agencies at the September 7, 2004 El Camino Real Multi-Agency Coordination Meeting, the project team has been evaluating potential mitigation sites for wetlands creation. The attached Word file summarizes the results of two planning meetings, at which a City and consultant team developed mitigation planning guidelines, identified six feasible sites, agreed upon seven key site evaluation criteria, selected a site evaluation methodology, and conducted the evaluation on the six sites. The two tables at the end of the meeting summary present the evaluation "scoring" process and the results. The attached pdf file is a map illustrating the location of the six sites evaluated.

Based on this process, which by this e-mail we are presenting to the Permitting Agencies for comment, the former Boudreau site (now owned by the JPA- Site #2)) is ranked highest (most preferable for mitigation), the Southern California Edison parcel (Site #4) is ranked second, and the Polo Club fields (Site #1) and a City-owned property (Site (#3) are tied at third.

In view of everyone's busy schedule, the project mitigation planning team is sending this e-mail for review and comment by the permitting agencies (and interested parties). We would be pleased to arrange a Multi-Agency coordination meeting to discuss this very important issue, if requested. Please route any comments, questions, or requests to me. We are particularly interested in the opinions of the permitting agencies on our site planning process and results. It is crucial to the progress of El Camino Real that we hear from each of our permitting agencies no later than November 30. Please reply with your concurrence, questions, or concerns as soon as reasonably possible.

Thank you for your attention to this matter, which is crucial for progress on the El Camino Real project.

Best regards,

Katherine

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CITY OF SAN DIEGO
EL CAMINO REAL ROAD/BRIDGE PROJECT
MITIGATION PLANNING MEETING #2 SUMMARY
OCTOBER 28, 2004

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DISCUSSION SUMMARY

The purpose of the meeting was to reach consensus within the project team on the mitigation sites and evaluation process, and to use the selected process to rank the feasible mitigation sites. Results of the meeting are summarized below.

1. MITIGATION GUIDELINES

a. The group agreed on the following guidelines for our mitigation planning.

- The focus of mitigation is on wetlands creation.
- The habitat type is brackish/salt marsh primarily to benefit clapper rail.
- It is preferable to accomplish all needed wetlands mitigation on one site.
- It is preferable to accomplish all needed wetlands mitigation in the Coastal Zone.

2. IDENTIFICATION OF FEASIBLE SITES

At Mitigation Planning Meeting #1 on October 7, 2004, the group developed the following Site Identification Criteria as essential characteristics of any site considered for mitigation:

- The site is within City of San Diego city boundaries.
- The site is within the *lower* San Dieguito River watershed.
- It would be feasible to create brackish marsh on the site.
- For mitigating impacts that occur in the San Dieguito River, it would be feasible to create habitat for the clapper rail on the site.
- The site does not currently have a use that would prohibit developing biological resources mitigation on it.
- The site would not require continual maintenance that would affect wetlands.
- The site is available to be considered for use as biological resources mitigation.
- For mitigating impacts that are within the Coastal Zone (west of the eastern edge of El Camino Real right-of way), the site is within the Coastal Zone.

At Mitigation Planning Meeting #1 on October 7, 2004, the group identified six feasible sites for wetlands mitigation to be evaluated. The group confirmed today there are no additional feasible sites. The San Pasqual Valley is not considered feasible because brackish marsh could not be created there. For this reason, the group modified the second Site Identification Criterion to be the *lower* San Dieguito River watershed.

The group verified the following sites will be evaluated:

1. Polo Club fields (north of river, east of El Camino Real)
2. Former Boudreau property, now owned by San Dieguito River Park JPA (about 70 acres south of river, west of El Camino Real)
3. City's San Dieguito Lagoon Mitigation Area (about 16 acres south of river, west of El Camino Real, fewer than 2 acres used by MWWD for mitigation)
4. SCE Property in San Dieguito Lagoon Wetland Restoration Project area (about 20 acres north of river, west of El Camino Real)
5. Hu Property (about 15 acres north of river, east of El Camino Real
6. City's Eastern Polo Club area (about 30 acres north of river, east of El Camino Real)

Regarding Site #2, Katherine noted that informal communication with the JPA indicates they intend to "market" the land for restoration mitigation only. The land cannot be sold as mitigation because it has already been purchased for open space preservation using a grant. However, the grant money did not include the cost to restore the property. It is likely that the JPA would actually do the mitigation if the participating agency would prefer that.

Regarding Site #3, Madison noted it does not appear that MWWD has specific ownership. He will verify that the property is under general City ownership. Norm noted the Lagoon Wetlands Restoration Plan would bring a branch of the river close to this area.

Regarding Site #4, Chris noted that Southern California Edison has verified this site is available for another entity to pay to implement the restoration plan. SCE would not do the restoration unless they have funding from another entity, as they do not need this acreage to accomplish their mitigation requirements.

3. SITE EVALUATION CRITERIA

a. The group agreed with the following guidelines:

- If we can't measure the criterion, it isn't useful.
- If the criterion doesn't differentiate the sites, it isn't useful.

b. Of the preliminary evaluation criteria the group identified at Mitigation Planning Meeting #1, the group agreed some should be deleted and some new ones should be added, as follows:

- Ownership (retain)
- Cost (delete; difficult to measure at this time due to federal limitations on negotiations)
- Impacts on existing infrastructure (delete; does not differentiate)
- Impacts on existing biological resources (retain)
- Impacts on other projects (add: "plans, or existing uses")
- Ability to connect to the San Dieguito River (retain)
- Ability to enhance existing biological resources for mitigation credit (delete; not meaningful since focus is on wetlands creation)
- Suitable zoning (delete; does not differentiate)
- Designated for restoration (new)
- Proximity of site to project impacts to clapper rail (new)
- Location of site in relation to Coastal Zone (new)

4. SITE EVALUATION METHODOLOGY

a. The group agreed to develop an objective evaluation methodology rather than a comparative methodology (meaning we will have an absolute "performance scoring" process, rather than compare the sites to each other).

b. The group agreed to assign points for characteristics/criteria in accordance with a simple 1 – 2 – 3 scale, with the high score being most favorable.

The definitions developed for performance scoring of the selected evaluation criteria are listed in Table 1. The results of the site evaluation with the process are in Table 2.

With this process, the JPA (former Boudreau) site is ranked highest, the SCE site is second, and the Polo Field and City Lagoon site are tied at third. We propose to investigate the feasibility of an arrangement with the JPA, with the SCE site as an alternative.

5. NEXT STEPS AND ACTION ITEMS

The group decided the next steps should be as follows:

1. Provide a summary of the mitigation planning to the agencies, and ask if they want to meet, or if they concur based on their review of the summary. ***Action: Katherine Hon***

2. Request a meeting with the JPA to discuss the feasibility of a mitigation agreement. ***Action: Abi Palaseyed***

3. Investigate the City's ownership of Site #3. ***Action: Real Estate Assets***

NOTE: These minutes are the preparer's understanding of the items discussed at the meeting. If discrepancies are noted, please contact the preparer within five working days of receipt.

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DISTRIBUTION:	Attendees and Interested Parties
DATE:	October 29, 2004
DISTRIBUTION	Permitting Agencies and Interested Parties
DATE:	November 15, 2004

TABLE 1
PERFORMANCE SCORING DEFINITIONS

Ownership

3 = Owned by City of San Diego
2 = Owned by a cooperative entity
1 = Other ownership

Impacts on Existing Biological Resources

3 = No impacts on sensitive biological resources
2 = Minimal impacts on existing biological resources
1 = Implementing mitigation would add to project wetlands impacts

Impacts on Other Projects/Plans/Existing Uses

3 = No impacts
2 = Mitigable impacts
1 = Would substantially interfere with other projects, plans, or uses of the site

Ability to Connect to the San Dieguito River

3 = Easily connected without changing river hydraulics
2 = Feasible to connect to San Dieguito River
1 = Difficult to connect to San Dieguito River, or could change river hydraulics

Designated for Restoration

3 = Site is already designated for wetlands restoration/creation
2 = Site is available for designation as a restoration area
1 = Site is not likely to be designated for restoration

Proximity of Site to Project Impacts to Clapper Rail

3 = Site is adjacent to clapper rail impact area
2 = Site is within ½ mile from clapper rail impact area
1 = Site is more than ½ mile from clapper rail impact area

Location of Site in Relation to Coastal Zone

3 = Site is entirely within the Coastal Zone
2 = Site is partially within the Coastal Zone
1 = Site is not within the Coastal Zone

TABLE 2
MITIGATION SITE EVALUATION PROCESS RESULTS

SITE	1 City's Polo Field	2 JPA (former Boudreau)	3 City's Lagoon Site	4 SCE Lagoon Site	5 Hu Parcel	6 City's Eastern Polo Field
CRITERIA						
Ownership	3	2	3	2	1	3
Biological Impacts	3	3	3	3	1	3
Project/Plan/Use Impacts	1	3	1	3	1	2
Ability to Connect to River	3	3	2	3	1	3
Restoration Designation	1	3	2	3	1	1
Proximity to Clapper Rail Impact Area	3	3	1	1	2	1
Location in Coastal Zone	1	3	3	3	1	1
TOTAL SCORE	**15**	**20**	**15**	**18**	**8**	**14**
RANKING OF SCORE	3rd (tie)	1st	3rd (tie)	2nd	5th	4th

1 = Polo Field 2 = Boudreau (JPA) 3 = MWWD 4 = SCE 5 = Hu 6 = Eastern Polo Field

khon@honconsultinginc.com

From: <John_DiGregoria@r1.fws.gov>
To: <TierraEnv@aol.com>
Sent: Wednesday, October 13, 2004 3:51 PM
Subject: Re: El Camino Real

Chris,

Based on your July 23, 2002 survey report and current conditions, there is no need to conduct further arroyo toad surveys for the El Camino Real Bridge project at the San Dieguito River.

John DiGregoria
Fish and Wildlife Biologist
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92009
760 431-9440
fax 431-5901
John_DiGregoria@r1.fws.gov

TierraEnv@aol.com
To: John_Digregoria@fws.gov
10/13/2004 10:11 AM
cc:
Subject: El Camino Real

John: The City of San Diego has asked me to contact you regarding arroyo toad at the El Camino Real Bridge project site. Several years ago, Jessie Delaya insisted that I do protocol surveys for the toad even though it was my opinion that there was no appropriate breeding habitat. Given the current situation with brackish conditions and clapper rails, do you agree? Can you please e-mail me regarding the need to do updated surveys for this species?

Thanks

Chris

Chris Nordby
Principal Biologist

CITY OF SAN DIEGO
EL CAMINO REAL ROAD/BRIDGE PROJECT
AGENCY COORDINATION MEETING SUMMARY
SEPTEMBER 7, 2004

ATTENDEES (in alphabetical order)

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Sherilyn Sarb	Coastal Commission	absent	619-767-2370	ssarb@coastal.ca.gov

NAME	AFFILIATION	PRESENT?	PHONE	E-MAIL
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Samir Tanious	Southern California Edison	absent		Samir.Tanious@sce.com
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CALTRANS				
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Gary Vettese		Yes	858-616-6523	Gary_Vettese@dot.ca.gov
VIA TELECON-FERENCE				
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Liz Varnhagen	EPA	Yes		Varnhagen.liz@epa.gov
Larry Vinzant	FHWA	Yes		Larry.vinzant@fhwa.dot.gov

DISCUSSION SUMMARY

1. Based on recent hydraulic analyses, the City finds that the river would not need to be widened substantially upstream and downstream and the bridge would not need to be lengthened 100 feet in order to achieve no net rise in 100-year water surface elevations upstream. The river widening as has been proposed is now not considered necessary to meet the project purpose and need. However, the City does not want to remove a prominent feature from the alternatives studied in detail in the EIR without consulting with the agencies.

2. Dr. Chang presented highlights from his hydrologic study, which focused on potential effects of the four river widening concepts on the downstream San Dieguito Lagoon Wetlands Restoration Project ("Edison/JPA project" herein), in response to questions from the agencies at the July 14, 2004 meeting. All agency contacts received an electronic copy of this brief report. The handout provided at the meeting presented two of the color graphics from the presentation, a diagram of the proposed Edison/JPA project, and an aerial photo of flooding in 1980 (35-year flood) from the beach east to El Camino Real. Dr. Chang's presentation included the following points:

   - The existing roadway is subject to overtopping in the 100-year flood.
   - Hydraulics in the river system are controlled by downstream conditions; therefore, changes in the floodplain at El Camino Real would only affect flood

levels upstream. Flood levels on the Edison/JPA project, which is downstream, would not be affected by El Camino Real.

- Effects of river widening on groundwater would likely not be significant because the widening would increase groundwater recharge area within the widened channel during low flow, but decrease groundwater recharge area upstream during low flow, and decrease groundwater recharge from inundated areas during relatively brief flood conditions.
- River widening would represent a removal of sediment from the watershed, so in the long term, there could be less beach sand supply resulting from river widening. This would not impact the JPA project because of the design of that project, but potentially could have an impact long-term on beach supply and/or foundation scour of downstream bridges/roads.
- River widening would increase sediment deposition in the widened area during low flow because velocity would be less. This could be adverse for wetlands created in the river. Also, downstream flows would contain less sediment, and scour potential in the downstream river channel could increase.
- The tidal basins that would be created by the Edison/JPA project would be protected from changes in the river conditions by berms.
- Certain changes to the bridge abutments under the proposed new bridge would be needed to avoid a net rise in upstream 100-year water surface elevations, but the extensive river widening and lengthening of the bridge would not be needed. These limited changes will be defined and analyzed in the EIR.

3. The clapper rails at and adjacent to the existing El Camino Real bridge are a major issue. The wetted area upstream of the bridge could decrease with a substantially widened river. CDFG is very concerned that the existing habitat, which is successfully supporting a dense population of the federal- and state-endangered bird, could diminish over time if conditions were drier in the river bed. Upstream conditions with the project implemented must be addressed thoroughly in the EIR. Clapper rail habitat that is impacted must be replaced per MSCP guidelines with clapper rail habitat, and not other habitat types.

4. Because the potential wetlands impacts from river widening were estimated very conservatively, USFWS and Caltrans believe total impacts to wetlands would be less than 5 acres even with river widening, and the project will not fall under the formal NEPA/404 Integration Process. In any event, the conclusion to not consider river widening/bridge lengthening as a variation on the alternatives means there will be no formal NEPA/404 Integration Process. However, the City will continue to have periodic joint agency coordination meetings, and will meet about specific issues with various agencies as the environmental process continues.

5. The extent, depth, and quality of groundwater are important factors in successfully creating wetlands. Groundwater infiltrates into the river bed and into the ponds on the golf course south of the river. Groundwater total dissolved solids (TDS) content is roughly 17,000 mg/l, or brackish water. Brackish marsh would be the most likely wetlands type to develop naturally and be sustainable.

6. Potential mitigation site locations for El Camino Real include 1) the Boudreau property south of the river and west of El Camino Real, which was recently purchased by the JPA; 2) City-owned Polo Fields north of the river and east of El Camino Real; 3) a privately-owned (Hu Family Trust) vacant property south of Via de la Valle and east of El Camino Real, which currently is mapped with substantial acreage of salt marsh although it is often used as a parking lot; and 4) approximately 16 acres controlled by Southern California Edison west of Horsepark's western boundary and north of the river.

7. The agencies agreed the private parcel adjacent to Via de la Valle is too far north of the river for creation of a beneficial clapper rail habitat. An off-river location such as the Polo Field, set apart from the river by berms, may require connection to the river via culverts set high enough to avoid collecting sediment, unless groundwater can sustain the wetlands. Silts and clays can significantly harm wetlands, and this would be an issue for in-river mitigation.

8. The JPA would prefer that mitigation planning for El Camino Real focus on either the former Boudreau property, as their goal is to develop habitat restoration in this area, or on the 16-acre site for which Southern Edison developed a mitigation plan, but which it does not need to create. The JPA is open to including the types of wetlands needed for El Camino Real mitigation in the draft restoration plan developed for the former Boudreau property, which currently emphasizes a non-tidal design.

9. Alternative D, which is further to the east than the other alternatives, would allow the bridge and road north of the bridge to be constructed without phasing. This would avoid the need to build a two-lane bridge and road to one side of existing El Camino Real, then shift traffic to the new segment, demolish the existing bridge, and build the other half, a process that would be required for all of the other alignment alternatives. The eastern alignment alternative could be built in roughly half the time of the phased alternatives, and would create substantially less temporal impacts in the river during construction. This would help with impact avoidance and minimization, which are important to the CDFG and others. It is possible that single columns rather than pairs of columns could be appropriate for the eastern alignment bridge, which would cause less temporary and permanent impacts in the river than the other alignments. For the eastern alignment alternative, the old bridge would be demolished, but the timing would be more flexible because there would not be any traffic on it once the new facility is completed. The agencies requested that details on the timing and duration of construction for each alignment alternative be provided in the EIR. CDFG wants construction work in the river done outside the breeding/nesting season of March – mid-August.

10. JPA wants to see the EIR address cumulative effects, including the I-5 widening and other projects mentioned during the discussion.

11. At the end of the meeting, all agencies concurred that the substantial river widening and bridge lengthening concept could be addressed in the EIR as a concept that was considered but rejected, and not included as a feature of the road/bridge alignment alternatives addressed in detail. Agency comments are highlighted as follows.

- USFWS: Even if the choice were made to create wetlands in the river, the mitigation could be accomplished without widening the river under the new bridge, and requiring a substantially longer bridge. The EIR must document how the not substantially lengthened bridge would avoid increasing flow rate and velocity downstream of the bridge, since more flow in the 100-year event would be forced under the bridge due to the road embankments north of the bridge. Mitigation location(s) and concepts are the next issue to address, as well as potential impacts to the clapper rail. Wants to explore widening the river in areas outside of the bridge location to create mitigation.

- CDFG: The document does not need to address river widening as a variation of alternatives analyzed in detail in the EIR. Any upstream changes that could affect the clapper rail would be of concern. Mitigation development must focus on creating habitat that is of the type and in a location that would be beneficial to the clapper rail. Locations that are distant from the river would not be desirable to CDFG for effective clapper rail habitat mitigation. Salt marsh must be mitigated with salt marsh.

- FHWA: Putting public money to the best use is an important consideration. Could the money needed to create the wider river and longer bridge be applied more effectively elsewhere or saved?

- Corps of Engineers: Substantially lengthening the bridge is not an essential project feature.

- Coastal Commission: The current direction of minimizing wetlands impacts by not widening the river and lengthening the bridge substantially is acceptable. Discussions between the City and the Coastal Commission regarding increasing the road capacity to four lanes are ongoing, because Coastal Commission is concerned about widening the bridge/roadway when wetlands are impacted.

- San Diego Regional Water Quality Control Board: The current direction of the group is acceptable. The eastern alignment alternative that would allow the bridge to be built all at once and not phased in two construction stages would reduce temporal impacts of construction in the river, which is a favorable aspect of that alternative.

- City of San Diego Environmental: For CEQA, the alternatives are driven by what is needed to meet the project purpose and need. Because the substantial river widening variations would not be needed to accomplish the project, and because they complicate the EIR, the City would prefer to not include substantial river widening and bridge lengthening as part of the detailed alternatives.

- JPA: The JPA would prefer to not have substantial river widening included in the alternatives for El Camino Real because of uncertainties in long-term beach sand supply, which was an extremely sensitive issue for the San Dieguito Lagoon Wetland Restoration Project. Cumulative impacts on the river system, particularly on the overall health and function of the river, should be addressed in the EIR.

NOTE: These minutes are the preparer's understanding of the items discussed at the meeting. If discrepancies are noted, please contact the preparer within five working days of receipt.

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DATE: September 17, 2004

CITY OF SAN DIEGO
EL CAMINO REAL ROAD/BRIDGE PROJECT
MEETING SUMMARY
JULY 14, 2004

ATTENDEES

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DISCUSSION SUMMARY

1. Hydraulic effects of river widening are crucial in the decision of whether or not this is a desirable project feature. Potential changes in flow characteristics upstream and downstream, and in the 2-year, 10-year, and 100-year flow are all of concern and need to be understood by the agencies before they can give an opinion about river widening. They also would like to know if hydraulics vary with the different river widening concepts (South Only, North Only, and North & South). How does the flow regime change with removal of the bottleneck at the bridge?

2. All the agencies would appreciate an explanation by Dr. Howard Chang, who has conducted extensive hydraulic modeling for the San Dieguito Lagoon Wetlands Restoration Project. They would like to have a letter report from Dr. Chang a week in advance of the next meeting, and have a presentation by Dr. Chang at the next meeting.

3. Effects on groundwater of river widening are also of concern and an important factor. Would a wider river reduce groundwater flow downstream in low-flow conditions because there would be more infiltration upstream? If there is increased infiltration, where would that water re-surface?

4. Impacts of the road/bridge project must be evaluated in the context of the potential impacts on the San Dieguito Lagoon Wetlands Restoration Project. The issue of how river widening could affect the clapper rail habitat also is important, since it is documented that there are at least 6 pair in the river at/upstream of the bridge. The effects could be beneficial or detrimental, depending on how the river hydraulics are affected.

5. If there is a benefit to the JPA/SCE project, benefit to river hydraulics, and benefit to clapper rail habitat, USFWS would not be opposed to the river widening concept.

6. Mitigation areas within the watershed are desirable. There may be mitigation land available in a potential mitigation bank created as part of the San Dieguito Lagoon Wetlands Restoration Project, and/or there may be suitable land within the lagoon project area that is not currently planned for wetlands development.

7. The additional wetlands impacts indicated in Table 1 of the June 17 letter as caused by river widening are conservative. With proper construction restrictions and design, edge effects may be reduced to be near zero.

8. The agencies agreed that **permanent** impacts are where valued vegetation is dug up and/or filled in, even if replacement vegetation is planted nearby. Therefore, the impacts to the drainage ditches would be considered permanent.

9. Although disturbance from activities in construction easements is often considered a temporary impact, there is a temporal consideration, according to USFWS. If the duration of construction is lengthy, impacts in a construction easement may be considered permanent. In the case of El Camino Real, the river in the project area encompasses inhabited clapper rail habitat, and the construction time would be extensive (estimated as at least 18 months), so construction easements probably would be considered permanent impacts.

10. The Corps of Engineers generally only counts permanent impacts when they determine if a project is or is not in the NEPA/404 Integration Process. The

threshold for being in the NEPA/404 process is 5 acres or more of permanent wetlands impacts.

11. EPA generally combines both permanent and temporary impacts when counting acreage for determining if a project is in the NEPA/404 Integration Process. What qualifies as "temporary impacts" has not been well defined.

12. In the case of the City's El Camino Real project, the total of temporary and permanent wetlands impacts is estimated as roughly 4 acres without river widening. If river widening is not incorporated, or if it could be accomplished with minimal wetlands impacts, the project would not be in the NEPA/404 Integration Process. However, all participants expressed the desire to continue to work together toward creating the best project possible and facilitating future permitting efforts, even if the project does not end up in the formal NEPA/404 Integration Process.

13. Wetland vegetation is underneath the bridge. A wider bridge could be considered to fragment the clapper rail habitat.

14. Potential mitigation sites must be identified now, and their impact on river hydraulics must be modeled.

15. The priority is to avoid wetlands impacts.

16. The Coastal Commission has many of the same concerns as the other agencies, including avoiding impacts to wetlands, and differentiating between permanent and temporary impacts of the project. The mitigation ratio they typically use for permanent impacts of the kind that would occur for the City's El Camino Real project is 4:1. There needs to be a demonstrated improvement in fish and wildlife habitat for a project component to be permissible.

17. For the Coastal Commission, widening the road (and bridge) to provide 4 travel lanes is increasing capacity, and this may not be an acceptable incidental public purpose when there are wetlands impacts. It was noted that currently, peak hour traffic is at Level of Service F. The offsets included in the project must be defined. A separate meeting will be needed with Coastal Commission to discuss their specific issues.

18. Caltrans noted that the project alternatives discussed in detail in the EIR/EA will have to satisfy the project purpose and need. Narrow footprint road cross-sections that would not improve traffic level of service or public safety would not satisfy the purpose and need.

19. The purpose and need was summarized in the June 17 letter.

20. The focus of FHWA is on the bridge. Lengthening the bridge by 100 feet to accommodate river widening adds roughly $4 million to the project estimated construction cost.

21. The JPA and Lagoon project team members should be invited to the next meeting. Bruce McIntyre with PDC should be consulted for input on who should be invited.

22. MSCP staff from the City should be invited to the process. Clapper rail management directives will be needed for the project.

NOTE: These minutes are the preparer's understanding of the items discussed at the meeting. If discrepancies are noted, please contact the preparer within three days of receipt.

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DISTRIBUTION:	Attendees
DATE:	July 28, 2004

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92009

In Reply Refer To:
FWS-SDG-3236.2

JUN 11 2003

Mr. Chris Norby
Principal Biologist
Tierra Environmental Services
9903 Businesspark Ave., Ste. E
San Diego California 92131-1120

Re: Request for Candidate, Proposed, Threatened, or Endangered Species List for the Proposed El Camino Real Road and Bridge Widening Project, San Diego County, California

Dear Mr. Norby:

The U.S. Fish and Wildlife Service (Service) has reviewed the information provided in your May 1, 2003, letter to assess the potential presence of federally listed threatened, endangered, or proposed species at the proposed project site. We do not have site specific information for your project area. However, to assist you in evaluating whether or not the proposed project may affect listed species, we are providing the attached list of species that occur in the general project area. We recommend that you seek assistance from a biologist familiar with your project site, and with the listed species to assess the potential for direct, indirect, and cumulative effects likely to result from the proposed activity. You should also contact the California Department of Fish and Game for State-listed and sensitive species that may occur in the area of the proposed project. Please note that State-listed species are protected under the provisions of the California Endangered Species Act.

If it is determined that the proposed project may affect a listed or proposed species, or the designation of any critical habitat you should initiate consultation (or conference for proposed species) with the Service pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act). Informal consultation may be used to exchange information and resolve conflicts with respect to listed species prior to a written request for formal consultation.

Should you have any questions regarding the species listed or your responsibilities under the Act, please call John DiGregoria of my staff at (760) 431-9440.

Sincerely,

Lee Ann Carranza

for Peter C. Sorensen
Acting Assistant Field Supervisor

Enclosure

Listed Endangered, Threatened and Proposed Species
that may occur in the vicinity of the El Camino Real Bridge
at the San Dieguito River in San Diego County, California

Common Name	Scientific Name	Status
BIRDS		
light-footed clapper rail	*Rallus longirostris levipes*	E
PLANTS		
San Diego ambrosia	*Ambrosia pumila*	E

E=Endangered

State of California - The Resources Agency
GRAY DAVIS, *Governor*

DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
4949 Viewridge Avenue
San Diego, CA 92123
(858) 467-4201

June 9, 2003

Jon Petke
The Planning Associate
3151 Airway Avenue, Suite R-1
Costa Mesa, CA 92626

Subject: Notification of Lake or Streambed Alteration Notification No. R5-2003-0139
(Fairbanks Ranch Country Club Golf Course Completion)

Dear Mr. Petke;

This letter is in response to the Lake or Streambed Alteration Notification Package (No. R5-2003-0135) that you submitted to the Department of Fish and Game (Department) for your proposed completion of the Fairbanks Ranch Country Club's golf course, located within the City of San Diego, San Diego County.

The Fairbanks Ranch Country Club's ("FRCC") project restarts construction work to complete the nine "holes" necessary to make the existing 18 holes of golf consistent with the originally approved 27-hole golf course complex, and complete the restoration of wetland/riparian habitats. The Department originally authorized the 27-hole golf course project pursuant to Streambed Alteration Agreement Notification No.V-82-311, issued on January 20, 1983. The northern perimeter of the project (i.e., the south river channel) was designed and approved for an earthen berm and rip-rap with a variable slope gradient built up to the 22-23 foot contour. It was constructed as designed along most of the realigned river, but in the area now targeted for completion of the nine holes of golf, the interim grading has built the area up to the approximate 10-14 foot level.

Project Description

FRCC purposes to complete construction of the golf course substantially as it was originally designed and authorized, with the construction of the final nine "holes" of golf. This work also includes raising the river channel berm on the northern edge of the construction site to its originally designed 22-23 foot contour level.

In completing the golf course complex, FRCC will undertake to enhance and maintain existing riparian habitat, and create new riparian habitat, using the native riparian plants prescribed by the original Landscape Concept Plan. See attached Table 1 and Exhibits D-1 and D-2 for the listing and location of the existing 97 acres of riparian habitat, its status and its proposed enhancement ("use area" 1-3), and the proposal to create 12 new acres of marsh and riparian inter-connected habitat ("use area" 4 on Exhibit D-2) that is included as part of the proposed completion of the remaining nine holes of golf. The result is 109 acres of riparian habitat. The location of these wetlands is generally conforming to the original project description; however, FRCC has proposed to shift approximately 12 acres of mitigation area from the northern edge of the San Dieguito River to the south. FRCC shall annually monitor and report to the Department for five years on the status of this riparian habitat enhancement and creation undertaking.

Although not required by any project approvals nor credited as habitat mitigation by the Department, FRCC has committed to incorporate an additional 15 acres of marsh and/or riparian habitat into the nine hole golf course design ("use area" 7, 8 on Table 1, as depicted on Exhibits D-1 and E). Combining this with the existing 4 acres of preserved willow pond ("use area" 5) and the 19 acres of previously created lakes on the existing 18-hole golf course ("use area" 6), the overall aquatic/riparian habitat total associated with the 27-hole complex will be 147 acres. See Table 1.

Described in more detail below is the planned construction associated with the completion of the nine holes of golf and the planned work on the existing river channel berm.

Golf Course Construction Work

The nine hole construction project will involve clearing and grubbing, depositing additional clean fill and associated rough grading to reconfigure the construction base, and finally, finished contour grading and installation of the golf course components (tee boxes, fairways, greens, cart path, etc.). See Exhibit F for a schematic of the finished site.

Environmental Commitments:

1. At a minimum, a total of 109 acres of riparian habitat will be enhanced, maintained, and created as described on Table 1, including 12 new acres of inter-connected marsh and riparian habitat incorporated into the design of the 9-hole golf course completion ("use area" 4 on Table 1).

2. A soft-bottom overpass structure will be created for the existing golf course cart path that currently crosses through the existing depression located in "Area 1" on Exhibit D-2. The will allow for a natural habitat corridor connection between the planned riparian areas in the nine hole construction area and the San Dieguito River channel.

River Channel Berm Work

The river channel berm work will involve widening the inland reach of the river's south perimeter with an approximately ten-foot setback and raising its berm height from the existing 10-14 feet to 22-23 feet. No construction work, equipment or workers will be operating within the existing riparian vegetation. This will be accomplished by staking the upland edge of the existing riparian vegetation dripline (including any pickleweed that is part of the riparian line of vegetation). An additional 5-foot buffer will be added to this exclusion zone.

Above the 5-foot buffer, the existing berm will be widened in the upland area (*i.e.*, away from the riparian vegetation) and raised by excavating into the existing graded area down to the water line and sloping the reconfigured berm back, with additional earthen fill, to its new height of 22-23 feet. Native planting with trees and shrubs from the approved Landscape Plan will be installed to stabilize the berm slope. Subject to specific field construction opportunities, the excavated portion of the berm cut will only be partially backfilled so as to leave a "shelf" along the river's edge that will be conducive to the establishment of riparian willows and other native riparian species. See Exhibits G-1, G-2, G-3 for a series of schematics illustrating this construction work.

Environmental Commitments:

3. All work will be conducted above a five foot buffer measured from the 8-10 foot contour line which describes the upland edge of the river's riparian vegetation. This line will be staked and contractors will be required to keep men and equipment on the upland side of this line.

4. Best management practices will be employed to insure that the construction work will not result in discharges to the river. These BMPs, summarized from the SWPPP, include, but are not limited to:

   a. Vehicle and equipment service
   b. Material delivery, handling and storage
   c. Dust control
   d. Sediment basins
   e. Slope stabilization
   f. Drain inlet protection
   g. Spill prevention and response.

5. Once completed, the river side berm will be vegetated with native riparian and upland plant species from the Landscape Plan's approved plant list. See Exhibit H. Generally, Sand Bar Willow Thickets, Arroyo Willow Forest, and Black Willow Hummocks will be planted in the lower reaches of the river berm, and groves of cottonwood and sycamores will be planted in the upper reaches. The source plant material will include, to the extent available, seeds and cuttings recovered from the riparian species that can occasionally be found growing in upland areas away from

the existing riparian vegetation line.

6. All earth moving work will occur between April 15th and October 15th, 2003 (unless otherwise approved by the Department).

7. On an annual basis, the FRCC will cause the removal of non-native vegetation in the San Dieguito river channel south perimeter and throughout the riparian areas of the completed 9-hole area.

   In the river channel itself, the non-native plant removal will focus on hand removal of tamarisk; however, if other invasive exotic species are encountered, they will also be removed. The only equipment used in the river channel will be hand held chainsaws and other handheld tools. Removal of the tamarisk trees will be carefully undertaken in a manner to avoid, to the extent practicable, any adverse effect on the existing native riparian habitat. The tamarisk removal is scheduled to occur after September 15th of this year, but before the onset of the rainy season. If necessary due to early rains, tamarisk removal would be continued until the fall of 2004.

   Enhancement activities shall comply with California Fish and Game Code Section 3503, which prohibits the take, possession or needless destruction of the nest or eggs of any bird. Therefore, unless a nesting survey is conducted by qualified biologist seven-days (or less) prior to riparian habitat enhancement activities, such activities will be conducted out-side of nesting season (March 15 through July 31). All nest sites shall be avoided until the nest is no longer active, and the young are no-longer dependent on the parent(s). A minimum 100-foot work exclusion zone will be established around an active nest by using flagging ribbon, or similar method. The work exclusion zone could be modified, based on the sensitivity of the species to human presence and activity. <u>The Department shall be provided copies of the biologist's field notes for the nesting survey prior to commencing activities.</u>

Construction practices common to work on both the river channel berm and the golf course construction will include pre-construction surveys by qualified biologists for nesting birds as well as any endangered or threatened species, including the least Bell's vireo among others. <u>Construction will not commence without the advance approval of the Department in any area where nesting birds or any listed species are found.</u> A one million dollar construction bond is posted in favor of the City of San Diego to financially guarantee the completion of the project elements, including the proposed riparian habitat enhancement and creation work described herein. <u>FRCC will cause a post-construction monitoring report to be completed by a qualified biologist which will evaluate the effect of the environmental commitments and will make recommendations, if any are required, to address any documented shortcoming in the intended effect of the commitments.</u> <u>This document will be provided to the Department for review and</u>

comment.

FRCC intends for the subject grading work to commence during June 2003. FRCC's contractor is Ranger Construction Industries, Inc. All earth moving work is scheduled for completion by October 15, 2003.

To help evaluate and monitor the success of these commitments, FRCC has given permission for site visits from any representative of the Department at any time. For safety and liability purposes, FRCC requests that the Department give as much advance notice as possible prior to visiting the site so that appropriate arrangements can be made. Please note that Department Peace Officers have authority per law to enter onto properties when they are carryout their law enforcement duties, and no statements in this letter should be interpreted to limit a Department Peace Officer's right of entry as defined by State law.

Conclusion

Based on the Department's review of the information you submitted and through a site visit (conducted by Don Chadwick of the Department), the Department has determined that a Streambed or Lake Alteration Agreement is not required for your project or activity because the project or activity 1) does not substantially divert, obstruct, or change any natural flow or bed, channel, or bank of a river, stream, or lake, or 2) use material from a streambed, or 3) substantially adversely effect existing fish or wildlife resources.

As a result, you may begin your project or activity if you have obtained all other necessary permits. If the project or activity changes from that stated in the submitted notification package above, a new notification shall be submitted to the Department.

Nothing in this letter authorizes the Operator to trespass on any land or property, nor does it relieve the Operator of responsibility for compliance with applicable federal, state, or local laws or ordinances. This letter does not constitute the Department's endorsement of the proposed project or activity, or assures the Department's concurrence with permits required form other agencies.

A copy of this letter and attachments thereto should be readily available at the work site(s) at all times during periods of active work and must be presented to any Department personnel, or personnel from another agency upon demand.

Sincerely,

Donald R. Chadwick

Donald R. Chadwick
Senior Environmental Scientist

Attachments:

- Table-1
- Exhibit D-1
- Exhibit D-2
- Exhibit E
- Exhibit F
- Exhibit G-1
- Exhibit G-2
- Exhibit G-3
- Exhibit H

cc: Stream Alteration Compliance Team
Cathy Cibit, City of San Diego

TABLE 1

SUMMARY OF RIPARIAN AREAS

The table below is a summary Project Description of the existing and proposed riparian areas associated with FRCC's proposed completion of the 9-holes of golf at its existing golf course.

Use Area Number	Area of Use	*Riparian* Acreage	Current Status	Project Description
1	Excavated Channel	$65\pm$[1]	Riparian vegetation with tamarisk and other non-native plants	Remove the non-native tamarisk.
2	Riparian Vegetation	13 (Area 'K') 6 (Area '8')	Riparian vegetation with non-native plants	Remove the non-native plants.
3	East Tributary	13	Riparian vegetation with non-native plants	Remove the non-native plants.
4	West - Water/Marsh Area (Created))	12	Rough graded; populated with non-native plants	Creation of 12 acres of water/marsh areas in the 9-hole proposed area.
RIPARIAN ACREAGE TOTAL		109		
5	Preserved Willow Pond	4	Intact.	N/A
6	Lakes (Existing)	19	Intact.	N/A
7	Wetland/Riparian Planting (Created)	12	Rough graded, populated with non-native plants.	To be created.
8	East – Water Marsh Area (Created)	3	Rough graded, populated with non-native plants.	To be created.
AQUATIC HABITAT TOTALS		147		

1 The original 300-foot wide excavated channel has been widened to 550 feet where it turns west and has been fully vegetated. The entitlement to remove vegetation from the channel for flood conveyance purposes is neither valid any longer nor is it proposed by the applicant or the City.

CULTURAL RESOURCE INVENTORY FOR THE EL CAMINO REAL ROAD/BRIDGE WIDENING

Project Permit No. L2928
Log No. 97-14-1

Prepared for:

Earth Tech
9675 Businesspark Ave.,
San Diego, CA 92131-1120

Prepared by:

Tierra Environmental Services
9915 Businesspark Ave., Suite C
San Diego, California 92131-1120

Patrick McGinnis, RPA
Michael Baksh, Ph.D.

December 2005

National Archaeological Data Base Information
Type of Study: Cultural Resource Survey
Sites: CA-SDI-14,969 (SDM-W-45), CA-SDI-686 Locus C, CA-SDI-8225/H, CA-SDI-14,968 (SDM-W-45A)
USGS Quadrangle: Del Mar 7.5'
Area: Approximately 37 acres
Key Words: City of San Diego, Cultural Resource Survey

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ABSTRACT

Tierra Environmental Services (Tierra) conducted cultural resource inventories of approximately 37 acres in 1998, 2003, 2004, and 2005 for proposed improvements to a portion of El Camino Real crossing the San Dieguito River Valley, to determine if cultural resources would be impacted. The project crosses the San Dieguito River northeast of Del Mar. Cultural resource work was conducted in accordance with the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA) and their respective implementing regulations and guidelines. The City of San Diego will serve as lead agency for CEQA compliance while the Federal Highway Administration (FHWA) will serve as lead agency for NEPA. The U. S. Army Corps of Engineers will become a reviewing agency in later stages of the project due to Federal permitting requirements, and the California Department of Transportation (Caltrans) will also serve as a reviewing agency.

In 1998, and 2003 archaeological site and literature reviews were conducted at the South Coastal Information Center and the San Diego Museum of Man. The record searches revealed that one previously recorded site CA-SDI-686 Locus C was located within the area of potential effect (APE). The site was previously determined by the City of San Diego not to be significant, and was not relocated during the surveys conducted in 1998 and 2003. Overall, 33 previous cultural resource studies have been conducted within a one-mile radius of the project area and 55 previously recorded cultural resources have been located within a one-mile radius of the project area.

Three sites CA-SDI-14,969, CA-SDI-8,225/H and CA-SDI-10,117 were recorded adjacent to the project area and an effort was made to ensure that these sites did not extend into the APE. All three of these sites were relocated and found to be outside the APE.

A cultural resource survey of the property was first conducted on June 12, 1998 using 10-15 meter interval transects. CA-SDI-686 Locus C appears to have been heavily impacted by the realignment of El Camino Real and was not relocated within the APE. Only a small amount of shell was identified southwest of the proposed project in an area of tomato fields.

From 1998 to 2005 the proposed project underwent several revisions. Based on project changes, the APE was surveyed on May 21-22, 2003, March 21, 2004, and December 7, 2005 to determine if any previously recorded sites or unrecorded cultural resources are located within the APE. An examination of the area where CA-SDI-686 Locus C was previously located, found no resources located within or immediately adjacent to the APE. This portion of site CA-SDI-686 Locus C has been destroyed by grading and road construction. As part of a cultural resource study conducted for the realignment of El Camino Real in 1986, Wade and Cardenas (1986) determined that due to the heavily disturbed nature of the area, the locus was not significant. The subsequent realignment of El Camino Real in the vicinity of San Dieguito Road has further obliterated the

portion of the site within the current APE, and no further work at CA-SDI-686 Locus C is necessary.

The project APE includes a portion of the historic path of El Camino Real traversed by Portola's 1769 expedition. El Camino Real has been designated California Registered Historical Landmark No. 784. The section of El Camino Real within the APE retains its integrity of location, but no longer retains integrity of setting as the valley has become increasingly developed. In addition, the roadway has been raised above the original historic trail and is currently paved, lacking integrity of materials, workmanship, design, feeling and association. Therefore, current project plans will not have an adverse effect on the portion of El Camino Real within the APE.

The bridge crossing the San Dieguito River within the project area of potential effect (APE) is known as the El Camino Real Bridge (57C0042). This bridge was built in 1940 and is of historic age. The bridge was evaluated for significance by Caltrans in 1986 and determined not to be eligible for nomination to the National Register of Historic Places (National Register). Because that evaluation is more than 10 years old the bridge was again evaluated by Caltrans in 1998 and the previous findings confirmed. At the request of the City of San Diego, the bridge was evaluated again in 2003 for the current project by Dr. Stacey Jordan, Ph.D., who concurred with the Caltrans opinion and found the bridge not to be a significant resource under CEQA or City Historical Resources Guidelines.

Consultation with Caltrans resulted in the identification of three parcels that required historic resource evaluation due to their proximity to the APE. APN-302-21-051, APN-302-21-052, and APN-302-26-103 were evaluated for their potential significance and listing on the National Register of Historic Places (National Register) and the California Register of Historical Places (California Register). Parcels 302-21-051 and 302-21-052 are located south of Via de la Valle and west of El Camino Real. Parcel 302-26-103 is located southeast of the intersection of San Dieguito Road and El Camino Real but has since been removed from the project area.

The northern portion of the project area along Via de la Valle was undeveloped as of 1872, though the La Jolla Quad of 1903 indicates a structure west of El Camino Real on the south side of Via de la Valle. Previous research reported that, in 1919, a dairy was established on 20 acres at the intersection of El Camino Real and Via de la Valle (Bronson 1968:54). The 1928 San Diego County aerial photographs show a cluster of buildings at this intersection west of El Camino Real and south of Via de la Valle. In addition, a bridge over the San Dieguito River is visible along El Camino Real. The buildings and bridge are also apparent in 1945 US Navy and 1953 AXN aerial photographs of the project area. These buildings were subsequently removed, and the two current structures, All Creatures Veterinary (APN-302-21-051) and Mary's Tack and Feed (APN-302-21-052), were constructed in about 1982 and 1984, respectively (Mosley 2003).

The only cultural resource located within the APE, CA-SDI-686 Locus C, has been destroyed and is not eligible for the National Register or California Register, however, the possibility for sites buried by Holocene alluvium exists. Construction monitoring by a qualified archaeologist is recommended to address the potential for buried cultural resources. Additionally, a Native American monitor should be present during construction activities to monitor for potential cultural remains of concern to the Native American community. Archaeological and Native American monitoring should be conducted for all primary earth movement related to biological mitigation, contouring, and bridge and road improvements. If cultural resources are encountered during the construction process, the archaeological monitor shall have authority to redirect construction until the resource is evaluated and treated appropriately.

Native American consultation is an important aspect of the project. A Native American contact program was conducted to identify Traditional Cultural Properties and concerns in the project area. Letters notifying the Native American community of the project and requesting information were provided to Native American representatives on the City of San Diego's contact list on December 11, 1998. Copies of the contact letters and the mailing list are included in Appendix B. Mr. Clarence Brown Sr. (now deceased) from the Viejas Band of Mission Indians responded by phone to the Native American contact letters on January 25, 1999. He expressed concerns related to the potential for human remains in the area and wanted to be involved in any testing or construction monitoring.

I. INTRODUCTION

A. Project Description

Central Alignment Alternative

The Central Alignment Alternative proposed for this project would involve the construction of a new bridge and the widening of the existing El Camino Real roadway. The roadway would be widened to 37 m (122 feet) in order to accommodate four travel lanes, bike lanes and a pedestrian walkway/parkway. The entire length of the road would be elevated above the 100-year flood level on 0.6 to 3.0 m (2 to 10 feet) of fill. The Central Alignment alternative also would allow for the construction of a multi-use trail under crossing. This crossing proposed by the Joint Powers Authority (JPA) would consist of a trail platform set at the projected 10-year flood level.

The existing bridge would be demolished and replaced with a box girder structure. The new bridge would be supported by six piers and two abutments. The implementation of this alternative would impact sensitive wetland habitats contained in two drainage ditches located adjacent to the proposed project alignment. Consequently, five other alternatives, as described below. All five variations of the Central Alignment alternative are presented below.

Road Capacity Alternative

This alternative would have a reduced project footprint (18.3 m (60 feet) in width) and an alignment shift to the west to avoid the existing drainage channel that parallels the eastern side of El Camino Real Road. The objective of this alternative is to increase road capacity. The project would replace the bridge, raise the road and widen it to 18.3 m (60 feet) to accommodate four traffic lanes. Retaining walls would be required on both sides of the road. At the same time, the parkway, pedestrian walkway, bicycle lanes and median would be eliminated. This alternative would not provide left turn pockets for recreational or commercial facilities located along El Camino Real Road.

Bicycle Safety Alternative

Like the Road Capacity Alternative, this alternative would have a reduced project footprint (18.3 m (60 feet) in width) and an alignment shift to the west to avoid the drainage ditch to the east. However, the focus of this alternative would be to enhance public safety for bicyclists. Thus, the project would include a bridge replacement and raising the road but would accommodate only two traffic lanes. Retaining walls would be constructed on both sides of the raised road. Bicycle lanes and a median would be included in this alternative but the parkway and pedestrian walkway would be eliminated.

Western Alignment Alternative

This alternative would include a bridge replacement and raising and widening the road to 37 m (122 feet). Again, the adjacent drainage ditch would be avoided with an alignment shift to the west. However, in order to accommodate all the proposed components of this variation, additional right-of-way would have to be acquired from the Horse Park and private landowners at Via de la Valle and San Dieguito Road. For this alternative, slopes would be created on both sides of the road.

Eastern Alignment Alternative

This alternative would have the same road width as the Central Alignment Alternative and Western Alignment Alternative. However, for this alternative, the alignment would be shifted to the east to minimize right-of-way requirements from the adjacent Horse Park and to avoid the drainage ditch located directly east of El Camino Real Road. Additional right-of-way would have to be acquired from other landowners adjacent to El Camino Real Road. This alternative would require that the new El Camino Real Road would align with De La Valle Place, thus eliminating the existing intersection at Via de la Valle. Similar to Western Alignment Alternative, slopes would be constructed on both sides of the road for this alternative.

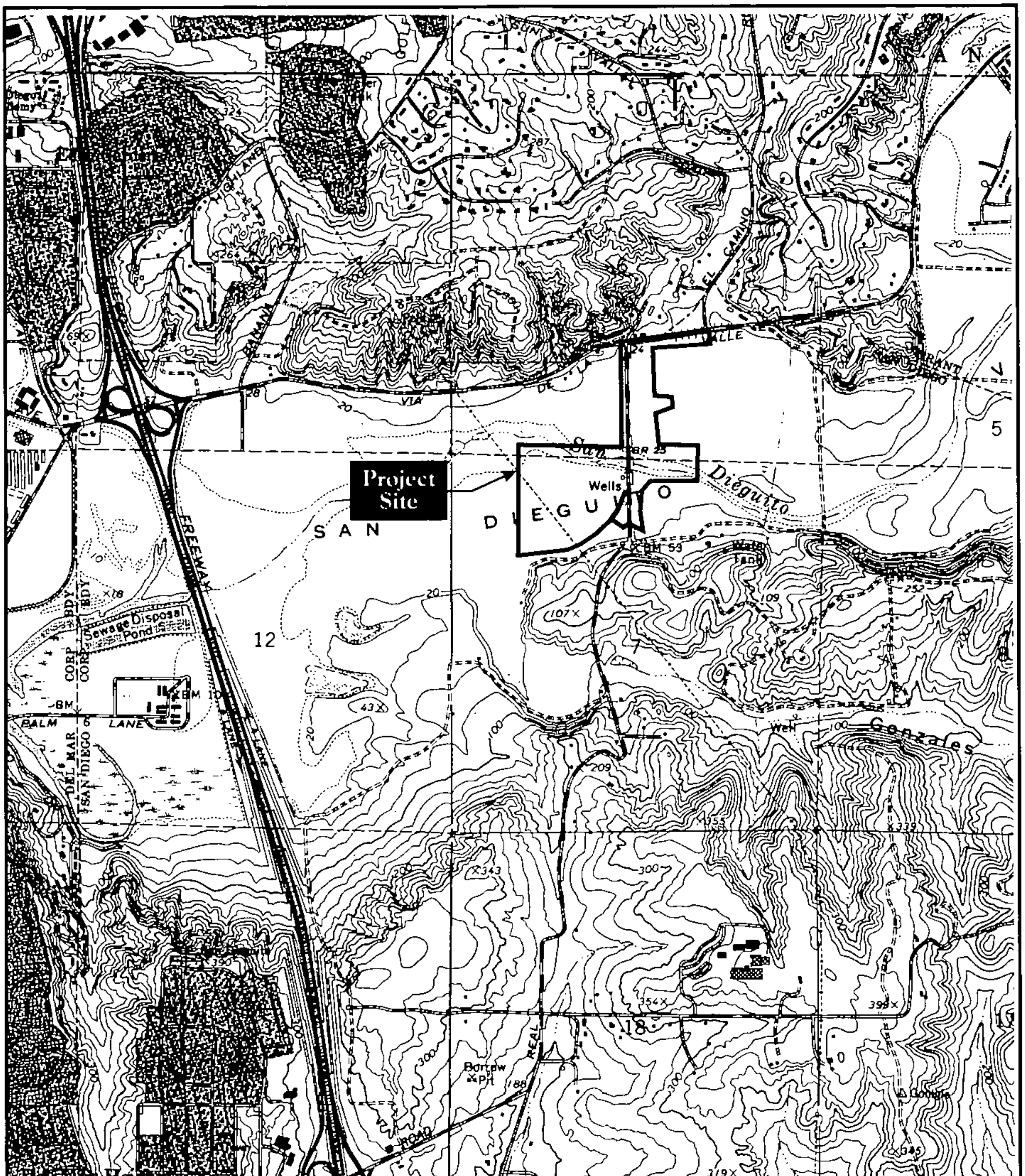
Lower Elevation Alternative

This alternative was developed to address concerns regarding visual impacts resulting from the proposed improvements to El Camino Real Road. This alternative would involve the same horizontal alignment and project features as the Central Alignment Alternative and would be 37 m (122 feet) in width. This alternative would raise the bridge just enough to accommodate the 100-year flood. At this lower elevation, the bridge would not accommodate the JPA multi-use trail under crossing that was proposed on a platform above the estimated 10-year flood level. However, the crossing of the river bed by equestrians would not be affected.

The project is located on the northern edge of the City of San Diego between the southern edge of Solana Beach and Rancho Santa Fe (Figure 1). The project is within Sections 6 and 7, Township 14 South, Range 3 West as shown on the Del Mar 7.5' USGS Quadrangle (Figure 2). The project area of potential effect encompassing all of the alternatives is shown in Figure 3 on a City of San Diego 1:800 scale engineering map and on an aerial photograph in Figure 4.

Figure 1
Regional Location Map

TIERRA
ENVIRONMENTAL SERVICES

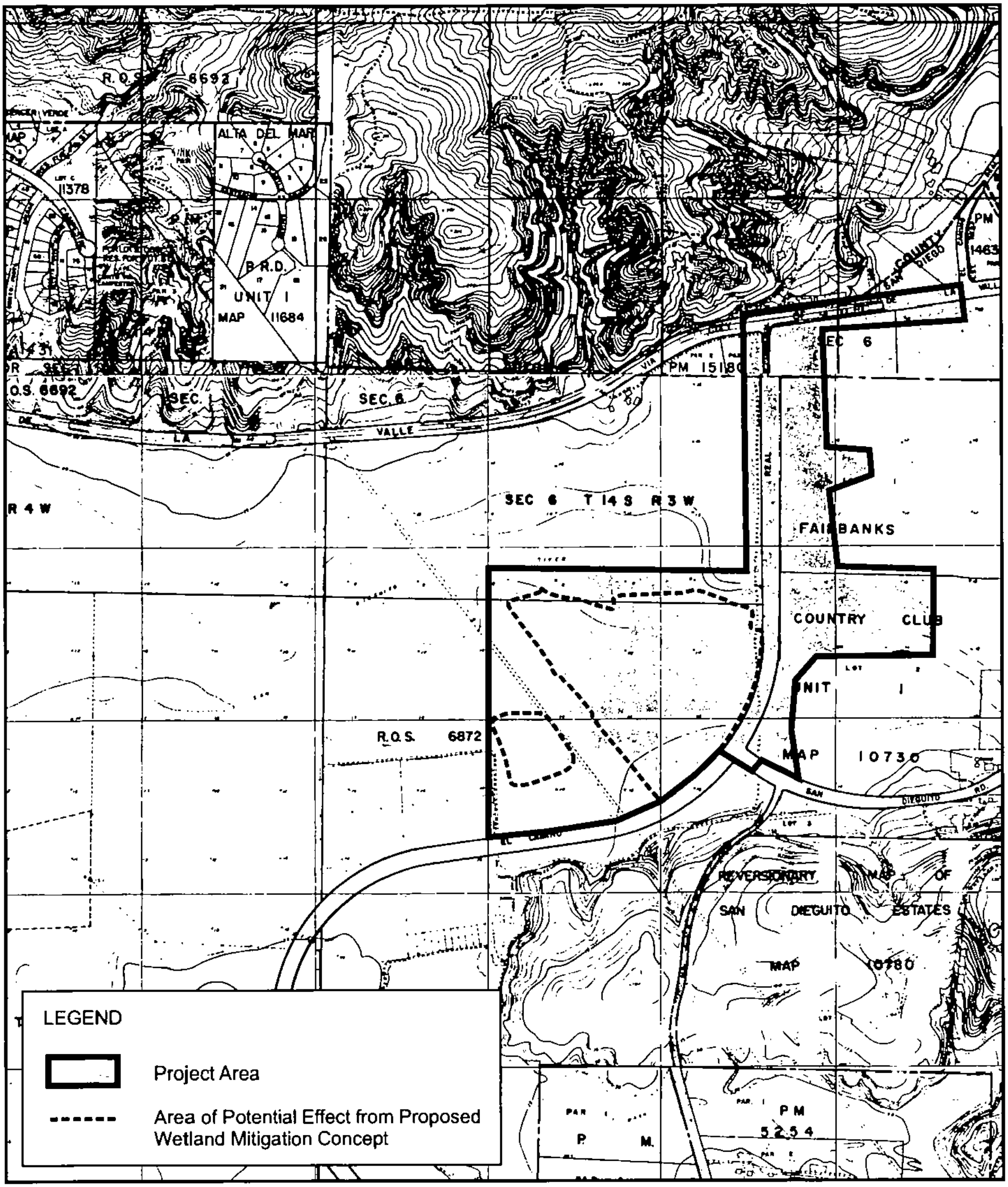


SOURCE: USGS 7.5' Quad Maps (Del Mar 1969 Edition Photorevised in 1975)

Figure 2
Project Location Map

0 1000 2000
FEET

TIERRA
ENVIRONMENTAL SERVICES



SOURCE: City of San Diego, Engineering and Development Department Map Book, Sheets 290-1698 and 298-1698

Figure 3
Study Area on City of San Diego 800-Scale Map

0 400 800
FEET

TIERRA
ENVIRONMENTAL SERVICES

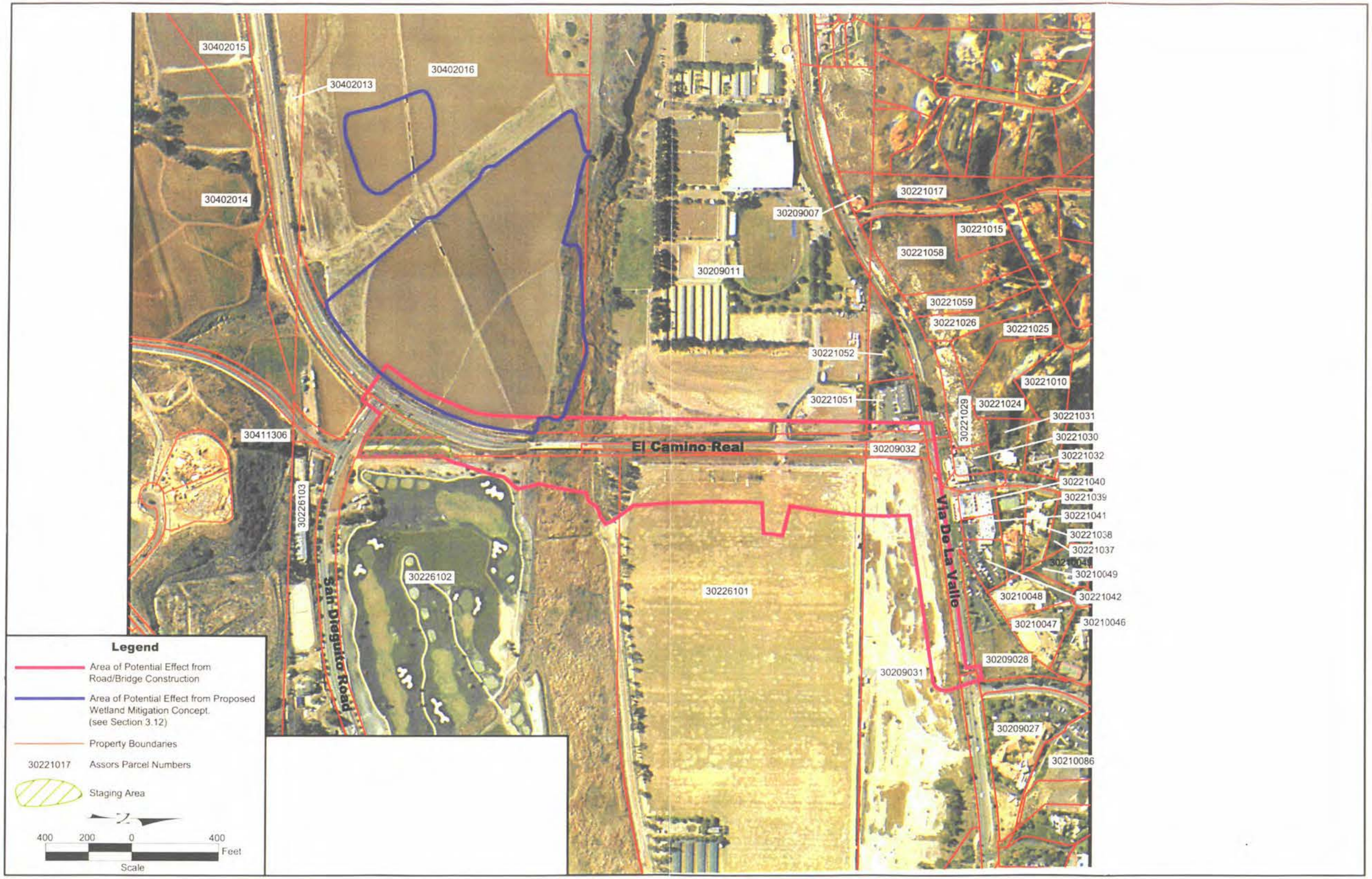


Figure 4
Study Area on Aerial Photograph

TIERRA
ENVIRONMENTAL SERVICES

The goal of the current survey was to determine if any cultural resources were located within the project area. Cultural resource work was conducted in accordance with the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA) and their respective implementing regulations and guidelines, including the City of San Diego's Resource Protection Ordinance (RPO). The City of San Diego will serve as lead agency for CEQA compliance while the Federal Highway Administration (FHWA) will serve as lead agency for NEPA. The U. S. Army Corps of Engineers will become a reviewing agency in later stages of the project due to Federal permitting requirements and the California Department of Transportation (Caltrans) will also serve as a reviewing agency.

B. Project Personnel

The cultural resource inventory was conducted by Tierra Environmental Services (Tierra), whose cultural resources staff meet State requirements in accordance with CEQA and its respective implementing regulations and guidelines. Dr. Michael Baksh served as Principal Investigator for the work conducted in 2003-05. Dr. Baksh has a Ph.D. in Anthropology from the University of California, Los Angeles and is on the City of San Diego's list of qualified archaeologists. Mr. Patrick McGinnis served as Project Archaeologist for the surveys and evaluations performed 2003-05. Mr. McGinnis has a MA in Archaeology and Heritage form the University of Leicester, England and has several years experience in the region. Mr. McGinnis is also on the City of San Diego's list of qualified archaeologists. Resumes of lead project personnel are included in Appendix A

Mr. Andrew R. Pigniolo served as Principal Investigator for the work conducted in 1998. He is on the City of San Diego's list of qualified archaeologists. Mr. Pigniolo has an MA in Anthropology from San Diego State University and has extensive experience in the San Diego region. Richard Bark and Emily Kochert served as Associate Archaeologists during the field surveys. Mr. Bark holds a Bachelor of Arts degree in anthropology from San Diego State University and has extensive experience in the region. Ms. Kochert has a degree in Anthropology from the University of Florida, Gainesville and over two years experience in southern California archaeology.

C. Structure of the Report

This report follows the State Historic Preservation Office's guidelines for Archaeological Resource Management Reports (ARMR). The report introduction provides a description of the project and associated personnel. Section II provides background on the project area and previous research. Section III describes the research design and survey methods and Section IV describes the results.

II. NATURAL AND CULTURAL SETTING

A. Natural Setting

The project area is located in the northern portion of the City of San Diego in the San Dieguito River Valley. This segment of El Camino Real is located approximately 1.25 miles east of Interstate 5 and is accessible from the east and west from Via de la Valle and from the south from Del Mar Heights Road. The project alignment is generally flat with the exception of the river bed. Elevation along the alignment is approximately 20 feet above mean sea level (MSL) but drops between 5 to 10 feet from the existing roadbed to the adjacent habitat. Elevation at the San Dieguito River bottom is approximately 5 feet above MSL.

The project crosses the San Dieguito River floodplain extending into geologically more stable lands at both its northern and southern end. Most of the project area is located within the Holocene alluvial plain of the valley. A steep rise to the top of the marine terrace is present to the north of the project. This rise includes small caves weathered into outcrops of Torrey Sandstone. The southern end of the project extends to the base of a long east/west trending ridge. Gonzales Canyon opens into the San Dieguito River Valley just west of the southern end of the project.

The project area is part of the coastal plain and is dominated by sedimentary marine terraces. The Torrey Sandstone formation is a compact sandstone that forms the upper part of these terraces. It is capped by the often plain-like Linda Vista Formation even higher on the terrace (Kennedy 1975). The Torrey Sandstone Formation is part of a large series of marine deltas that were formed during the Eocene. These were later truncated during a period of higher sea level by the Linda Vista Formation.

Below both of these formations and just above the Holocene alluvium of the valley floor is the Pleistocene Bay Point Formation (Kennedy 1975). This is an even more recent marine formation occurring at lower elevations along the San Diego coastline. Both ends of the project cross this formation. Most of the project area, however, is made up of Holocene age sediments from the San Dieguito River floodplain. The San Dieguito River would have provided the major source of freshwater to the area.

Soils consist mostly of Tujunga sand, 0 to 5% slopes (TuB) which dominates the alluvial valley bottom. Grangeville fine sandy loam, 0 to 2% slopes (GoA) and Corralitos loamy sand, 5 to 9% slopes exist to the north and south in areas of higher elevation (Bowman et al. 1973).

The climate of the region can generally be described as Mediterranean, with cool wet winters and hot dry summers. Low annual rainfall limits vegetation growth but vegetation is particularly adapted to the climate of the area. Six vegetation types occur in the project area including Diegan coastal sage scrub, mulefat scrub, freshwater marsh, southern coastal salt marsh, coastal brackish marsh and ruderal fields. Developed areas and agricultural fields also occur along portions of the alignment.

Diegan coastal sage scrub is characterized by low, woody subshrubs that grow to approximately 3 feet (1 meter) in height (Holland 1986). Common dominant species include California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*) and white sage (*Salvia apiana*). Mulefat scrub is characterized by Holland as a depauperate, tall, herbaceous riparian scrub dominated by mule fat (*Baccharis salicifolia*).

Freshwater marsh is characterized by relatively quiet sites, undisturbed by significant currents, that typically are dominated by perennial, emergent monocots that grow to approximately 12 and 15 feet (between 4 and 5 meters) tall. This community is commonly dominated by rush (*Scirpus* sp.) and cattail (*Typha* sp.) species and includes species such as sedges (*Carex* sp.), spike sedges (*Eleocharis* sp.), and nutsedges (*Cyperus* sp.). Freshwater marsh occurs at the northern edge of the San Dieguito River on the west side of El Camino Real, and along the southeast corner of the El Camino Real/Via de la Valle intersection.

Open water/freshwater marsh describes the area within the San Dieguito River channel. Water flow in this area varies seasonally such that open water exists in the channel during the relatively wet, winter season but when conditions become drier in the spring and summer, freshwater marsh vegetation is dominant.

Southern coastal salt marsh is characterized by Holland as a highly productive community found in areas that receive regular tidal inundation. This community is comprised of salt-tolerant species that are typically active in the summer, dormant in the winter, and may grow to 3 feet (1 meter) in height. A remnant strand of coastal salt marsh, parallels the east side of El Camino Real north of the existing bridge.

Coastal brackish marsh is characterized by species similar to those found in southern coastal salt marsh and is dominated by perennial, emergent monocots that grow up to 6 feet (2 meters) tall. Unlike salt marsh habitat, however, this community receives freshwater input which creates brackish conditions. Common species include sedges (*Carex* ssp.), salt grass, rush (*Juncus* sp.), pickleweed (*Salicornia* sp.), bulrush and cattails (Holland 1986). Components of these communities provided important resources to Native Americans in the region. This vegetation type occurs northeast of the bridge and parallels El Camino Real.

Animal resources in the region include deer, fox, raccoon, skunk, bobcats, coyotes, rabbits, and various rodent, reptile, and bird species. A stable deer herd was once present in this area. Small game, dominated by rabbits, is relatively abundant. Coastal resources are located less than 2.5 miles west and include shellfish and other animal species.

B. Cultural Setting

Paleoindian Period

The earliest well documented prehistoric sites in southern California are identified as belonging to the Paleoindian period, which has locally been termed the San Dieguito complex/tradition. The Paleoindian period is thought to have occurred between 9,000 years ago, or earlier, and 8,000 years ago in this region. Although varying from the well-defined fluted point complexes such as clovis, the San Dieguito complex is still seen as a hunting focused economy with limited use of seed grinding technology. The economy is generally seen to focus on highly ranked resources such as large mammals and relatively high mobility which may be related to following large game. Archaeological evidence associated with this period has been found around inland dry lakes, on old terrace deposits of the California desert, and also near the coast where it was first documented at the Harris Site.

Early Archaic Period

Native Americans during the Archaic period had a generalized economic focus on hunting and gathering. In many parts of North America, Native Americans chose to replace this economy with types based on horticulture and agriculture. Coastal southern California economies remained largely based on wild resource use until European contact (Willey and Phillips 1958). Changes in hunting technology and other important elements of material culture have created two distinct subdivisions within the Archaic period in southern California.

The Early Archaic period is differentiated from the earlier Paleoindian period by a shift to a more generalized economy and an increased focus on use of grinding and seed processing technology. At sites dated between approximately 8,000 and 1,500 years before present (B.P.), the increased use of groundstone artifacts and atlatl dart points, along with a mixed core-based tool assemblage, identify a range of adaptations to a more diversified set of plant and animal resources. Variations of the Pinto and Elko series projectile points, large bifaces, manos and portable metates, core tools, and heavy use of marine invertebrates in coastal areas are characteristic of this period, but many coastal sites show limited use of diagnostic atlatl points. Major changes in technology within this relatively long chronological unit appear limited. Several scientists have considered changes in projectile point styles and artifact frequencies within the Early Archaic period to be indicative of population movements or units of cultural change (Moratto 1984) but these units are poorly defined locally due to poor site preservation.

Late Archaic or Late Prehistoric Period

Around 2,000 B.P., Yuman-speaking people from the eastern Colorado River region began migrating into southern California, representing what is called the Late Prehistoric Period. The Late Prehistoric Period in San Diego County is recognized archaeologically by smaller projectile points, the replacement of flexed inhumations with cremation, the introduction of ceramics, and an emphasis on inland plant food collection and processing, especially acorns (True 1966). Inland semi-sedentary villages were established along major water courses, and montane areas were seasonally occupied to exploit acorns and piñon nuts, resulting in permanent milling features on bedrock outcrops. Mortars for acorn processing increased in frequency relative to seed grinding basins. This period is known archaeologically in southern San Diego County as the Yuman (Rogers 1945) or the Cuyamaca Complex (True 1970).

The Kumeyaay (formerly referred to as Diegueño) who inhabited the southern region of San Diego County, western and central Imperial County, and northern Baja California (Almstedt 1982; Gifford 1931; Hedges 1975; Luomala 1978; Shipek 1982; Spier 1923) are the direct descendants of the early Yuman hunter-gatherers. Kumeyaay territory encompassed a large and diverse environment which included marine, foothill, mountain, and desert resource zones. Their language is a dialect of the Yuman language which is related to the large Hokan super family.

There seems to have been considerable variability in the level of social organization and settlement variability. The Kumeyaay were organized by patrilineal, patrilocal lineages that claimed prescribed territories, but did not own the resources except for some minor plants and eagle aeries (Luomala 1976; Spier 1923). Some lineages occupied procurement ranges that required considerable residential mobility, such as those in the deserts (Hicks 1963). In the mountains, some of the larger groups occupied a few large residential bases that would be occupied biannually, such as those occupied in Cuyamaca in the summer and fall, and in Guatay or Descanso during the rest of the year (Almstedt 1982; Rensch 1975). According to Spier (1923), many Eastern Kumeyaay spent the period of time from spring through autumn in larger residential bases in the upland procurement ranges, and wintered in mixed groups in residential bases along the eastern foothills on the edge of the desert (i.e., Jacumba and Mountain Springs). This variability in settlement mobility and organization reflects the great range of environments in the territory.

Acorns were the single most important food source used by the Kumeyaay. Their villages were usually located near water necessary for leaching acorn meal. Other storable resources such as mesquite or agave were equally valuable to groups inhabiting desert areas, at least during certain seasons (Hicks 1963; Shackley 1984). Seeds from grasses, manzanita, sage, sunflowers, lemonadeberry, chia and other plants were also used along with various wild greens and fruits. Deer, small game and birds were hunted and fish and marine foods were eaten. Houses were arranged in the village without apparent pattern. The houses in primary villages were conical structures covered with tule bundles, having excavated floors and central hearths. Houses constructed at the mountain camps generally lacked any excavation, probably due to the summer occupation. Other structures included sweathouses, ceremonial enclosures, ramadas and acorn granaries. The material culture included ceramic cooking and storage vessels, baskets, flaked lithic and ground stone tools, arrow shaft straighteners, stone, bone, and shell ornaments.

Hunting implements included the bow and arrow, curved throwing sticks, nets and snares. Shell and bone fishhooks as well as nets were used for fishing. Lithic materials including quartz and metavolcanics were commonly available throughout much of the Kumeyaay territory. Other lithic resources, such as obsidian, chert, chalcedony and steatite, occur in more localized areas and were acquired through direct procurement or exchange. Projectile points including the Cottonwood Series points and Desert Side-notched points were commonly produced.

Kumeyaay culture and society remained stable until the advent of missionization and displacement by Hispanic populations during the eighteenth century. The effects of missionization along with the introduction of European diseases, greatly reduced the native population of southern California. By the early 1820s California was under Mexico's rule. The establishment of ranchos under the Mexican land grant program further disrupted the way of life of the native inhabitants.

Ethnohistoric Period

The Ethnohistoric period refers to a brief period when Native American culture was initially being affected by Euroamerican culture and historical records on Native American activities were limited. When the Spanish colonists began to settle in California, the project area was within the territory of a loosely integrated cultural group historically known as the Kumeyaay or Northern and Southern Diegueño because of their association with the San Diego Mission. The Kumeyaay as a whole speak a Yuman language which differentiates them from the Luiseño to the north who speak a Takic language (Kroeber 1925). Both of these groups were hunter-gatherers with highly developed social systems. European contact introduced disease that dramatically reduced the Native American population and helped to break down cultural institutions. The transition to a largely Euroamerican lifestyle occurred relatively rapidly in the nineteenth century.

Historic Period

Cultural activities within San Diego County between the late 1700s and the present provide a record of Native American, Spanish, Mexican, and American control, occupation, and land use. An abbreviated history of San Diego County is presented for the purpose of providing a background on the presence, chronological significance, and historical relationship of cultural resources within the county.

Native American control of the southern California region ended in the political views of western nations with Spanish colonization of the area beginning in 1769. De facto Native American control of the majority of the population of California did not end until several decades later. In southern California, Euroamerican control was firmly established by the end of the Garra uprising in the early 1850s (Phillips 1975).

The Spanish Period (1769-1821) represents a period of Euroamerican exploration and settlement. Dual military and religious contingents established the San Diego Presidio and the San Diego and

San Luis Rey Missions. The Mission system used Native Americans to build a footing for greater European settlement. The Mission system also introduced horses, cattle, other agricultural goods and implements; and provided construction methods and new architectural styles. The cultural and institutional systems established by the Spanish continued beyond the year 1821, when California came under Mexican rule.

The Mexican Period (1821-1848) includes the retention of many Spanish institutions and laws. The mission system was secularized in 1834 which dispossessed many Native Americans and increased Mexican settlement. After secularization, large tracts of land were granted to individuals and families and the rancho system was established. Cattle ranching dominated other agricultural activities and the development of the hide and tallow trade with the United States increased during the early part of this period. The Pueblo of San Diego was established during this period and Native American influence and control greatly declined. The Mexican Period ended when Mexico ceded California to the United States after the Mexican-American War of 1846-48.

Soon after American control was established (1848-present) gold was discovered in California. The tremendous influx of American and Europeans that resulted quickly drowned out much of the Spanish and Mexican cultural influences and eliminated the last vestiges of de facto Native American control. Few Mexican ranchos remained intact because of land claim disputes and the homestead system increased American settlement beyond the coastal plain.

C. Prior Research

A records search was conducted at the South Coastal Information Center at San Diego State University and the San Diego Museum of Man for a one-mile radius of the project area. The records search was performed in May 1998 and updated in response to project changes in June 2003. The records search indicated that the project area had not been previously investigated although numerous surveys have been conducted in the project vicinity. Table 1 indicates that at least 33 archaeological investigations have been conducted in the region. Most of these have been surveys and tests associated with development in the region. Table 2 indicates that 55 cultural resources have been recorded within a one-mile radius of the project area. Most of these resources are prehistoric temporary camps and shell scatters but also include prehistoric burials and historic period resources. One site, CA-SDI-686 Locus C, was recorded within the APE. Three sites, CA-SDI-14,969, CA-SDI-8,225/H and CA-SDI-10,117, were recorded near the APE.

The most important work in the project vicinity was the early investigations of Malcolm Rogers of the San Diego Museum of Man. Much of his work was conducted in the 1920s and is best documented by his site forms. Malcolm Rogers recorded site SDM-W-45 (CA-SDI-14,969) just beyond the northwestern edge of the project area and SDM-W-45A (CA-SDI-14,968) just to the west. CA-SDI-14,969 (SDM-W-45) is known as the Indian Caves site. Rogers identified several petroglyphs in the sandstone caves but also noted that a county road crew in 1917 uncovered a Late Prehistoric burial ground with funeral urns. Between 6 and 9 urns were recovered along with calcined bone and shell beads. These burials were apparently just west of the project area below the natural caves at the base of the slope and within the roadway of Via de la Valle.

CA-SDI-14,968 (SDM-W-45A) is mapped further to the west and outside of the project area. It is described as mostly covered with buildings, roads, and cultivation. Rogers noted that "in a ravine which cuts the site the structure of the cross section could be studied but the bottom of the Lit. II [Archaic] horizon was not exposed." He also noted that the site consisted of steep talus and the Late Prehistoric material was interbedded with wash sand and rock debris from the cliff. He thought CA-SDI-14,968 (SDM-W-45A) would produce good stratigraphy.

At the southern end of the project, a series of prehistoric sites have been recorded on the ridgeline. The sites most relevant to the project are CA-SDI-686, CA-SDI-8,225/H and CA-SDI-10,117. Site CA-SDI-686 was initially recorded in 1960 by Claude Warren. He described the site as a point of land with a few scattered artifacts on the surface and noted the presence of manos, scrapers, and choppers. The site was updated in 1984 by Muranaka during an El Camino Real extension project. She divided the site into four loci. Midden was noted along with debitage, a mano, lithic tools, and shell. She noted that the discrete loci appeared to represent temporary camps. Only about 50 flakes were noted over the entire site area which covers the northwestern side of the ridge. Locus C was the resource closest to the project area.

Robbins-Wade and Cardenas (1986) tested portions of CA-SDI-686 as part of a realignment of El Camino Real. Testing was confined to the right-of-way which limited their ability to completely define site boundaries. They determined the portion of Locus C within the right-of-way was peripheral to the main site area and was therefore not significant. The project was determined to have no significant effect on the site and the portion of Locus C formerly within the current project area appears to have been destroyed by the realignment project.

Site CA-SDI-10,117 was initially recorded by Robbins-Wade and Cardenas in1984 as part of the re-alignment of El Camino Real. The site was located on an alluvial terrace bordered on the north by San Dieguito Road and approximately 60 meters east of El Camino Real and scattered over an area of approximately 6,300 square meters. The site description noted a core, 40 flakes, 7 Tizon Brownware ceramic sherds, and shell fragments. A single shovel test recovered 13 flakes and 3 Tizon Brownware sherds down to depth of 30 cm. A scatter of shell was also noted directly across San Dieguito Road in a cutbank. In 1993 the site was relocated by Strudwick et al. That survey found that residence and stable construction associated with Rancho Del Mar had disturbed all of the site and located only four unidentifiable shell fragments.

CA-SDI-8,225/H lies east and north of CA-SDI-10,117 at the east edge of the APE. The site is recorded as encompassing an area 213 by 244 meters, and is bounded by San Dieguito Road on the south and San Dieguito River on the north. The site was originally recorded by Edward Dittmar in 1980 and was reported to contain multiple manos, metate fragments, and stone tools. The site was located within the site of the former Del Mar Riding School and was disturbed by the construction of buildings, corrals and parking lots. Site CA-SDI-8,225/H was evaluated for National Register eligibility by Mooney-Lettieri and Associates in 1983 in association with development of a golf course. During the 1983 investigation the site boundaries were expanded to their current extent. Materials recovered during the testing included desert and local prehistoric ceramics, obsidian and chalcedony flakes, fire-cracked rock, numerous stone tools, historic glass and ceramics, manos, metates, and a large amount of shell. Some of the glass appeared to have been worked suggesting Native American occupation during the historic period. The results of the testing concluded that the site was shallow and disturbed and did not met the necessary criteria to be eligible for the National Register and that the testing should be "considered as having fully mitigated project impact to this already disturbed cultural resource."

Historic research included an investigation of a variety of sources. The project area lies outside the southwest corner of the Rancho San Dieguito, whose 8,824.71 acres were later officially deeded by the United States Government to Juliana L. Osuna and family on April 18, 1871 (California State Archives 2000: MC 4:4-183). By 1872, the area of the San Dieguito River Valley between the ocean and the Rancho was occupied by 6 property owners, including the 160 acres owned by Ramon Rodríguez in the northeast quarter of section 7. Rodríguez owned the property as early as 1872 according to a San Diego County survey map of that year, and his rectangular adobe homestead was located approximately 100 yards east of El Camino Real along the new San Dieguito Road toward Fairbanks Ranch (Ewing 1988). Rodriguez's adobe would have been location in the proximity of the present stables at Rancho Del Mar (APN-302-26-103), an area which has been extensively graded, and no remnant was found during field survey. Two rectangular structures are present approximately 200' and 300' east of old El Camino Real in the 1928 San Diego County aerial photographs; a single building is shown approximately 300' east of the road on USGS topographic maps of 1903 and 1930.

The northern portion of the project area along Via de la Valle was undeveloped as of 1872, though the La Jolla Quad of 1903 does indicate a structure west of El Camino Real on the south side of Via de la Valle. The area appears on the 1912 Plat Map as land held by James Reasoner. Previous research reported that, in 1919, a dairy was established on 20 acres at the intersection of El Camino Real and Via de la Valle (Bronson 1968:54). The 1928 San Diego County aerial photographs show a cluster of buildings at this intersection west of El Camino Real and south of Via de la Valle. In addition, a bridge over the San Dieguito River is visible along El Camino Real. The buildings and bridge are also apparent in 1945 US Navy and 1953 AXN aerial photographs of the project area. These buildings were subsequently removed and the two current structures, All Creatures Veterinary and Mary's Tack and Feed, were constructed in about1982 and 1984, respectively (Mosley 2003).

Table 1. Archaeological Investigations Within a One-Mile Radius of the Study Area

Author	Project	Date
Berryman & Woodman	Archaeological Investigations for the San Dieguito Wetland Restoration Project EIR/EIS Science Application International Corporation.	2000
Bissell	Test Excavation of Archaeological Site SDM-W-2970, San Marcos, San Diego County, CA.	1992
Bull	An Archaeological Survey of San Dieguito Estates.	1978
Bull and Hatley	Excerpt from: "Draft: Environmental Impact Report for Highland Estates".	1977
Cardenas	A Cultural Resources Inventory for the El Camino Real Extension Alignment Study.	1984
Robbins-Wade and Cardenas	Cultural Resources Assessment: El Camino Real Realignment Right-of-Way.	1986
Cardenas and Winterrowd	Cultural Resource Inventory and Significance Assessment: Torrey Pines High School Site.	1985
Cardenas and Winterrowd	An Archaeological Investigation of SDM-W-26A: a Site Near Del Mar, CA.	1986
Carrico and Walker	Archaeological Investigations of the Dalfi Property, San Diego, California.	1978
Cheever	Cultural Resource Testing at the Stallions Crossing Project.	1990
Cheever and Eighmey	The Villages and the Ranch at Stallions Crossing: Cultural Resources Survey and Testing.	1993
Cheever and Wade	An Archaeological Survey Update an dSite Testing Program for the San Dieguito Valley Project Area	1989
City of San Diego	Public Notice of Draft Environmental Impact Report Rhodes Vesting Tentative Map.	1993
Cook	National Register Assessment of SDI-8225 (W-3632).	1983
Eighmey and Cheever	The Villas at Stallions Crossing: Cultural Resources Testing at SDI-687.	1996
Gallegos	Letter Cultural Resources Report for the Bame Property Project.	1995
Gallegos, et. al.	Historical/Archaeological Survey Report for Del Mar Highlands Estates San Diego, CA.	1995
Gallegos, Phillips and Eighmey	Appendix D: Draft Environmental Impact Report for the San Dieguito River Park Concept Plan.	1993
Hector	Archaeological Survey for El Camino Real Detention Basin (RECON # R-1652), SD, CA.	1986
Johnson and Gallegos, et. al.	Del mar Highland Estates, Planned Residential Development Permit (Dep No. 94-0576)	1997
Johnson and O'Boyle	Villages at Stallions Crossing. Draft Environmental Impact Report.	1996
Kyle	Historical/Archaeological Survey and Test Report for the Rancho Santa Fe Golf Practice Range.	1995
Norwood	The Cultural Resources of San Dieguito Estates.	1980
Peters and Fulmer	Ranch at Stallions Crossing	1996

Table 1. Archaeological Investigations Within a One-Mile Radius of the Study Area

Author	Project	Date
Pigniolo & Baksh	Cultural Resource Inventory of the Proposed Via Del Canon Residential Development, City of San Diego, CA	1998
RBR & Associates	A Cultural Resources Inventory for the El Camino Real Extension Alignment Study.	1984
Robbins-Wade and Gross	Archaeological Resources Inventory for the Armstrong Flower Hill Property Del Mar, San Diego, CA.	1998
Ryzdynski	Archaeological Investigation of Rancho De La Valle, Lomas Santa Fe - County of San Diego, CA.	1975
Ryzdynski, et. al.	Sun Valley Bluffs Lomas Santa Fe, County of San Diego.	1976
Smith	Results of an Archaeological Study for the Torrey Pines Summit Project.	1992
Smith	Archaeological Survey of a 1.38-Acre Development Project Conducted with Accordance to CEQA.	1992
Strudwick, Gallegos and Phillips	Historical/Archaeological Survey and Test Report for Subarea III Future Urbanizing Area SD, CA.	1993
Wade	Archaeological Survey of the Gonzales Canyon Sewer Line (RECON # R-1617), SD, CA.	1986
Whitney-Desautels	Cultural Resources Investigation of Ukegawa Brothers Agricultural Use permit Project, SD, CA.	1986

Table 2. Recorded Cultural Resources Within a One-Mile Radius of the Study Area

SDI#	SDM#	Site Type	Recorder
CA-SDI-194	SDM -W-1586	Temporary Camp	Norwood
CA-SDI-293	SDM -W-1585	Temporary Camp	Walker
CA-SDI-685	SDM -W-1584	Temporary Camp	Norwood
CA-SDI-686	SDM -W-1599	Temporary Camp	Hedges
CA-SDI-687	SDM -W-2294	Temporary Camp	Warren
CA-SDI-5154		Temporary Camp	Berryman
CA-SDI-5155		Temporary Camp	Berryman
CA-SDI-5369	SDM -W-40	Habitation	Rogers
CA-SDI-5370	SDM -W-1589	Temporary Camp	Norwood
CA-SDI-5371	SDM -W-1590	Temporary Camp	Norwood
CA-SDI-5372/H	SDM -W-1591	Historic Struct./Temporary Camp	Norwood
CA-SDI-5373	SDM -W-1587	Temporary Camp	Norwood
CA-SDI-5612	SDM -W-1667	Temporary Camp	Walker
CA-SDI-5937	SDM -W-1402	Temporary Camp	Carrico
CA-SDI-6870	SDM -W-2199	Lithic Scatter	Conners
CA-SDI-6871	SDM -W-2200	Shell Scatter	Norwood
CA-SDI-7287	SDM -W-2287	Temporary Camp	Carrillo
CA-SDI-7288	SDM -W-2288	Isolated Scraper	Carrillo
CA-SDI-7289	SDM -W-2289	Isolated Tizone/Shell Scatter	Carrillo
CA-SDI-7290	SDM -W-2290	Temporary Camp	Carrillo
CA-SDI-7291	SDM -W-2291	Temporary Camp	Carrillo
CA-SDI-7292	SDM -W-2292	Isolated Core	Carrillo
CA-SDI-7293	SDM -W-2293A	Temporary Camp	Carrillo
CA-SDI-7300	SDM -W-2300	Temporary Camp	Carrillo
CA-SDI-7301	SDM -W-2301	3 Manos	Carrillo
CA-SDI-8225/H		Temporary Camp/Historic	Cardenas
CA-SDI-9259	SDM -W-2303	Shell Scatter	Hanna
CA-SDI-9260	SDM -W-2304	Shell Scatter /Sparse Lithics	Hanna
CA-SDI-9261	SDM -W-2305	Shell Scatter w/1 Flake	Hanna
CA-SDI-9262	SDM -W-2306	Lithic Scatter	Hanna
CA-SDI-9263	SDM -W-2307	Temporary Camp	Hanna
CA-SDI-9268	SDM -W-2312	Lithic Scatter	Hanna
CA-SDI-9268	SDM -W-2316	Isolate Flakes	Hanna
CA-SDI-10,117	SDM -W-3522	Temporary Camp	Cardenas
CA-SDI-10,118	SDM -W-3523 A&B	Temporary Camp	Cardenas
CA-SDI-10,535/H	SDM -W-3692	Historic Structure	Robbins-Wade
CA-SDI-12,519	SDM-W-25A	Temporary Camp	Rogers
CA-SDI-13,094/H	SDM -W-5413	Hist. Trash Scatter/Temp. Camp	Eighmey
CA-SDI-14,968	SDM -W-45A	Shell Scatter/Burials	Rogers
CA-SDI-14,969	SDM -W-45	Shell Scatter	Pigniolo
CA-SDI-14,971		Lithic Scatter	Pigniolo

Table 2. Recorded Cultural Resources Within a One-Mile Radius of the Study Area

SDI#	SDM#	Site Type	Recorder
CA-SDI-15,376	SDM -W-7406	Shell Scatter	Bissell
CA-SDI-16,164		Hist. Trash Scatter	Robbins-Wade
P-37-016571		Shell Isolate	Pigniolo
P-37-016572		Shell Isolate	Pigniolo
-	SDM -W-2293B	Isolated Flake	Robbins-Wade
-	SDM -W-2303	Shell Scatter w/2 Flakes	Hanna
-	SDM -W-3523 C	Lithic Scatter	Cardenas
-	SDM -W-3632	Temporary Camp	Cardenas
-	SDM -W-3699	Temporary Camp	Cardenas
-	SDM -W-43	Temporary Camp	Rogers
-	SDM -W-467	Temporary Camp w/Burial	McDaniel
-	SDM -W-5392	Isolate Flake	Eighmey
-	SDM -W-5412	Isolate Flakes	Eighmey
-	SDM -W-5414	Isolate Flake	Eighmey
-	SDM -W-610	Temporary Camp	Ryzdnynski
-	SDM -W-611	Hearth	Ryzdnynski

III. RESEARCH DESIGN AND METHODS

A. Research Design

The goal of the current effort was to identify any cultural resources located within the project area so that any impacts of the alternatives could be included in the alternatives analysis. To accomplish this goal, background information was examined and assessed and a field survey was conducted to identify cultural remains. Based on the records search and historic map check, cultural resources are relatively abundant in the project vicinity and are most likely to be temporary camps focused on marine resources.

B. Methods

The literature search for the project was conducted at the South Coastal Information Center of the California Archaeological Inventory at San Diego State University and the San Diego Museum of Man. This records search included site records and reports for the project area within a one mile radius of the project.

A cultural resource survey for the project was first conducted by Andrew Pigniolo and Richard Bark on June 12, 1998. In 2003, project redesign necessitated the need for another survey of the project area to be performed. The second survey was conducted by Patrick McGinnis and Emily Kochert on May 21 and 22, 2003, the third by Patrick McGinnis on March 21, 2004, the final survey was conducted by Patrick McGinnis on December 7, 2005. The project area was walked using 10-15 meter (m) interval transects. Survey transects were conducted parallel to El Camino Real beginning in the northeast corner of the project. Although some areas of heavy wetland vegetation were present, other areas were open exposed soils. Additionally, the proposed biological mitigation site is currently used as for growing tomato crops which limited visibility to spaces of open ground between crop rows. In this area visibility was less than 30 percent .Overall, surface visibility was approximately 65 percent within the APE and was adequate to identify cultural resources within the project area. The survey covered all areas within the proposed project alternatives within the APE.

IV. RESULTS AND RECOMMENDATIONS

A. Results

No cultural resources were found within the APE. The previously recorded portion of CA-SDI-686 Locus C that is mapped within the APE was tested in 1986 by Cardenas and Wade and determined to be insignificant and not eligible for the National Register. In 1998, the survey of the locus by Pigniolo located two fragments of shell outside the APE in a tomato field. The current survey did not relocate these shell fragments or any other cultural remains within or adjacent to the APE. The portion of Locus C located in the APE appears to have been destroyed by past agricultural activity and the realignment of El Camino Real. No further work is necessary at site CA-SDI-686 Locus C.

Three sites CA-SDI-14,969, CA-SDI-8,225/H and CA-SDI-10,117 were recorded as located adjacent to the project area and an attempt was made to ensure that these sites did not extend into the APE. All three of these sites were relocated and found to be outside the APE.

Site CA-SDI-8,225/H was relocated adjacent to the project area. A single mano and a small shell scatter were found within disturbed soils that had been recently graded, but were outside the APE. In the time since the survey was conducted in May 2003, the site has been graded and excavated as part of the construction for a golf course. Additionally, imported fill soils have been brought in and further altered the landscape. The test and evaluation of the site by Mooney-Leitteri and Associates in 1983 determined that it was too shallow and disturbed to warrant eligibility for the National Register. The current alteration for the golf course has further degraded the area with nearly 100% of the site that has been graded or re-contoured with fill soil.

The bridge crossing the San Dieguito River within the project APE is known as the El Camino Real Bridge (57C0042). This bridge was built in 1940 and is of historic age. It has multiple arches and is constructed of poured concrete. The bridge was evaluated for significance in 1986 by Caltrans and determined not to be eligible for nomination to the National Register of Historic Places (National Register). This evaluation was based on age and architectural and engineering significance. Because this evaluation is more than 10 years old the bridge was reevaluated by Caltrans for significance in September 1998 and again in 2003. The bridge has been determined not eligible for nomination to the National Register or the California Register. At the request of the City of San Diego, the bridge was evaluated to CEQA and City of San Diego guidelines by Dr. Stacey Jordan who found it not to be a significant resource.

APN-302-21-051, APN-302-26-103 and APN-302-21-052 were evaluated for their potential significance and listing on the National Register of Historic Places (National Register) and the California Register of Historical Places (California Register). Parcel 302-21-051 is occupied by Mary's Tack and Feed (3675 Via de la Valle) and occupies the southwest corner of the El Camino Real/Via de la Valle intersection. Although the 1953 Del Mar Quadrangle shows structures west of the project area, no historic resources were located within the APE. Mary's Tack and Feed has been in business since 1963 and at its present location since 1984. The store was owned and operated by Ms. Mary Hammond until she sold it to current owner Michael Mosely in 1976. The business was originally run out of a storefront located across Via de la Valle where there is currently a steakhouse restaurant and other businesses in a mini-mall. Parcel 302-12-051 was occupied by a farmstead/dairy, although research has shown that there were no historic resources located within the APE. Although the parcel does contain a portion of site CA-SDI-14,969 within its boundaries, the site is outside the APE and no further cultural resource evaluation is necessary as long as the project plans remain unchanged. The proposed undertaking will not affect the impact the building or any cultural resources located within the parcel.

Parcel 302-21-052 is occupied by the All Creatures Veterinary Hospital (3665 Via de la Valle). Interviews with local property owners and a search of records at the County Assessor's office in addition to consulting City Directories have revealed that this building was built circa 1982 and was originally called Valle Veterinary and owned by Jack Recht D.V.M. In 1983 the name of the clinic was changed to Rancho Real Veterinary Hospital. The business first appears as All Creatures Veterinary in 1985 and currently retains the name although ownership has changed. A review of historic archives and photographic records indicate that the area was once occupied by the same farmstead/dairy mentioned above which may have existed up until construction of the present building. The parcel is now fully landscaped including large areas covered in sod, and appears to have been extensively graded. A scatter of shell and two metavolcanic flakes associated with CA-SDI-14,968 were located in the dirt walkway adjacent to Via de la Via and 200 feet outside of the APE. The proposed undertaking will not impact the building. APN-302-26-103 is no longer within the APE and contains an early 20th Century Craftsman farmhouse with associated outbuildings and features.

The project APE includes a portion of the historic path of El Camino Real traversed by Portola's 1769 expedition. El Camino Real has been designated California Registered Historical Landmark No. 784. The section of El Camino Real within the APE retains its integrity of location, but no longer retains integrity of setting as the valley has become increasingly developed. In addition, the roadway has been raised above the original historic trail and is currently paved, lacking integrity of materials, workmanship, design, feeling and association. Therefore, current project plans will not have an adverse effect on the portion of El Camino Real within the APE.

The only site previously located within the APE (CA-SDI-686 Locus C) has been destroyed and is not eligible for the National Register or California Register, although, the possibility for sites buried by Holocene alluvium exists.

B. Recommendations

Although no cultural resources were located within the project APE , the project is located in an area of high archaeological resource sensitivity. The San Dieguito River Valley is known for possessing a number of important sites, some of which are buried to great depth under Holocene alluvial deposits. For this reason and in conjunction with a lack of adequate visibility in some portions of the APE, archaeological monitoring is recommended for all ground disturbing activities associated with the implementation of the project. The following specific measures comprise the Mitigation, Monitoring and Reporting Program for Cultural Resources. Implementation of these measures would resolve any adverse effects that the undertaking may have on historic properties that may be discovered during project construction.

1. The following measures shall be made part of the construction plans and specifications for this Capital Improvement Project. Inclusion of the measures shall be verified by the City of San Diego Land Development Review Division (LDR) at the plan check stage.

2. Thirty days prior to the preconstruction meeting, the Engineering and Capital Projects Department project manager shall provide a letter of verification to the City's Environmental Review Manager (ERM) of LDR stating that an archaeologist or an archaeological monitor that, at a minimum, meets the City of San Diego historical Resource Consultant Qualifications for Archaeological Monitors, has been retained to implement the archaeological construction monitoring program. All persons involved in the archaeological construction monitoring of this project shall be approved by the LDR prior to the start of monitoring.

3. The project archaeologist shall ensure that a local Native American representative is involved in the monitoring program.

4. The archaeologist shall attend the preconstruction meeting to discuss the archaeological construction monitoring program with the contractor and City staff.

5. The archaeologist or archaeological monitor shall be present full-time during excavation into native soil. This means that if more than one area is under construction at the same time, an archaeologist or archaeological monitor would be required to be present at each of the sites.

6. The archaeologist shall have the authority to divert, direct, or temporarily halt ground-isturbing activities in the area of a discovery to facilitate the recordation and sampling of a potential historic property. The archaeologist shall notify the City Resident Engineer or the designee, the LDR, the Native American community, and the State Historic Preservation Officer (SHPO) at the time of discovery. The City shall assume any property that may be found, and for which there is no prior consensus determination, to be eligible for inclusion in the California Register. The archaeologist shall, subsequent to the above notifications, proceed, in consultation with the SHPO, to document representative profiles of the stratigraphy of newly found

archaeological deposits and to sample the matrix of each stratum. The archaeologist shall, subsequent to consultation with the SHPO, notify the City Resident Engineer or the designee and the LDR when the field recordation and sampling of a newly found historic property is complete so that the City may resume construction. The City and the SHPO agree that the monitoring, recordation, and sampling of potential historic properties under the above process would constitute satisfactory resolution of the undertaking's potential adverse effects to such properties.

7. The City shall ensure that, to the extent permitted under §§ 5097.98 and 5097.991 of the California Public Resources Code, the materials and records resulting from the above monitoring, recordation, and sampling process are curated in accordance with CEQA. All artifacts shall be analyzed to identify function and chronology as they relate to the history of the area. Faunal material shall be identified as to species and specialty studies shall be completed, as appropriate.

   Within three months following the end of the monitoring program, a monitoring report (with appropriate graphics) which describes the results, analysis and conclusions of the archaeological monitoring program shall be submitted to the City and the SHPO for review. The City shall ensure that the monitoring report is consistent with the Secretary of the Interior's *Standards for Archeological Documentation* and the *Secretary of the Interior's Guidelines for Archeological Documentation* (48 FR 44734-44737), and the California Office of Historic Preservation's December 1989 *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* [Preservation Planning Bulletin No. 4(a)].

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APPENDICES

APPENDIX A

RESUMES OF PRINCIPAL PERSONNEL

PATRICK M. MCGINNIS, M.A., RPA

Senior Archaeologist
Tierra Environmental Services

Education

M.A. Archaeology and Heritage Management , University of Leicester, England,
B.A., Anthropology with a concentration in Archaeology, with honors, University of California, San Diego,
Certificate in Archaeology, San Diego City College

Professional Affiliations

Register of Professional Archaeologists
Society for California Archaeology
San Diego County Archaeological Society (Past Secretary)
San Diego Historical Society
Wheelwright Museum of the American Indian
Archaeological Conservancy
National Trust for Historic Preservation

Qualifications

Mr. McGinnis has more than nine years experience in prehistoric and historic archaeology in southern California and the Southwest. He serves as supervisor and crew for fieldwork including survey, testing, data recovery, monitoring, site recording, in addition to supervising lab analysis, and collections management. He has training in GPS/GIS mapping and spatial analysis and has surveyed and monitored for endangered biological resources including Quino checkerspot butterfly, least Bell's vireo, and California gnatcatcher. He has received training in compliance with the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA) of 1966. His duties also include report writing and historical research projects.

Professional Experience

2002-present	Senior Archaeologist, Tierra Environmental Services, Inc.
2002	Archaeologist/Environmental Scientist, Anteon Corporation, California
1997 - 2002	Archaeologist, Mooney & Associates, San Diego, California.
1997	Archaeological field and lab crew, Center for Spanish Colonial Archaeology, San Diego, California.
1996 - 1997	Archaeology Field School, Rancho Peñasquitos site, with San Diego City College.

Relevant Projects

Friendship March Restoration Project

Mr. McGinnis served as project archaeologist for a survey and test of 500-acres of land in the Tijuana Estuary for the restoration of the marsh habitat of the area. The survey required permitting and interaction with both State and Federal agencies. Project duties also included directing the excavation of 49 backhoe trenches to locate potentially buried archaeological deposits as index for the project area in general. The survey resulted in the location of ten prehistoric and historic archaeological sites. Sites included prehistoric shell middens and lithic scatters in addition to historic sites; including features related to the use of the area as a naval base during WWII, and historic structures and features related to the period of rural when the area was dominated by ranching and farming. Mr. McGinnis was responsible for the laboratory analysis of the artifacts recovered from the project and directed the cleaning and curation of the assemblages from the identified sites. Mr. McGinnis is serving as report co-author of the NEPA and CEQA compliant document which is in progress.

Pine Valley Estates
Mr. McGinnis directed a survey of 38-acres for a proposed subdivision in the Pine Valley area of San Diego County. The survey resulted in recording seven prehistoric cultural resources. The sites were mostly large bedrock milling sites with multiple loci. Mr. McGinnis also served as report author for a County and CEQA compliant technical report.

Manzanita Reservation Hazardous Fuels Reduction Project
Mr. McGinnis served as project archaeologist for a survey of 1,000-acres of fee-land for the Manzanita Band of Mission Indians. The survey covered an area proposed for hazardous fuels reduction via prescribed buring and firebreak construction. The project resulted in the discovery of over 40 previously unrecorded archaeological sites and isolated artifacts. These were dominated by lithic scatters, rock cairns, habitation sites, and included rock rooms. Duties also included site recording and report authorship.

Los Coyotes Reservation-Pines Fire Archaeological Survey and Data Recovery Project
Mr. McGinnis served as Project Archaeologist and directed the survey of over 100 miles of bulldozer cuts in addition to directing the data recovery effort at two National Register eligible sites, CA-SDI-12,006 and CA-SDI-16,834. Duties also included site recording of eight unrecorded cultural resources, historical and archival research and report authorship.

Morongo Reservation Wastewater Treatment Facility and Section 8 Master Plan
As Project Archaeologist, Mr. McGinnis directed a survey of approximately 700-acres on the Morongo Indian Reservation in association with a master plan and proposed wastewater treatment facility for the Morongo Band of Mission Indians. Duties included site recording and authorship of the report.

Rincon Reservation Road Improvements
Mr. McGinnis directed test and evaluation of a historic/prehistoric site in association with proposed road improvements on the Rincon Indian Reservation in northern San Diego County. Duties included survey, mapping , excavation, laboratory analysis of recovered artifacts and report authorship.

Jacumba Water System Rehabilitation Project
Mr. McGinnis directed a survey of over 8,500 linear feet for the project. The survey resulted in the recording of four historic and prehistoric archaeological sites including a turn-of the-century stone house, 1920s hotel, and prehistoric habitation sites. Information from the survey was used to direct the planning effort in order to avoid sensitive cultural resources. Mr. McGinnis also authored the report.

Port of San Diego, Harbor Police Facility
Performed archival research and documentation for the historic Port of San Diego, Harbor Police Facility, designed by famed architect William Templeton Johnson including biographical research, title search, architectural assessment and co-authoring the report.

Hartman Residence
Mr. McGinnis conducted a historical assessment of the Hartman Residence in Encinitas, California. The residence is an early-20th century log-house and associated garage. Duties included completion of Department of Parks and Recreation forms for the resource and authorship of the report.

Bureau of Land Management Lawsuit Compliance
Manager for multiple projects for the BLM under this task. Duties included hiring, contract writing, proposal writing and cost estimating. Responsible for multiple employees, data collection, inter-agency communication and coordination, database management and development, and providing the client with weekly and monthly status reports for the project. Subtasks under the contract included monitoring of public land closures for the Ridgecrest and Needles BLM offices, a socio-economic study for a desert conservation area management plan, Saltcedar removal in highly impacted areas, Off-highway vehicle grant writing, construction and soil restoration monitoring and management plans and plant-water studies in the Death Valley Junction area.

Ramona Unified School District
Performed multiple archaeological surveys of school sites for the Ramona Unified School District. Tasks included historic and archival research of the site locations in addition to leading the surveys and co-authoring the reports of the field investigations.

San Diego Unified School District
Conducted field surveys and historic and archival research in association with planned expansion of Lincoln High School in South San Diego. Duties included inventorying and assessment of over 200 homes located within the proposed expansion areas and completion of State Historic Preservation Office forms for the historic resources located within the project area, in addition to contributing to the report.

Metromedia Fiber Optic Network
Coordinated numerous site record and literature searches for extensive fiber optic line construction covering the San Francisco Bay Area, Sacramento, Solano, Yolo, Los Angeles, Orange, and San Diego Counties in addition to directing surveys and monitoring; participating in field excavation, and site recording.

Campo Promise Land Ranch
Directed Phase II survey and archaeological test excavation of 13 historic and prehistoric sites in southern San Diego County. Performed site record, literature, and historic research including tax assessor records, title searches, and biography, for multiple historic cultural resources within the property boundaries. Completed necessary California Department of Parks and Recreation forms for submittal to the State Historic Preservation Office. Contributed to authorship of the report.

Department of the Navy, Southwest Division. Participated in the Phase II testing of two prehistoric sites, monitored grading activities, and participated in NAGPRA compliant excavation and analysis of human remains for the MILCON project on northern Camp Pendleton. Participated in the Phase II and Phase III data recovery excavation on the Naval Submarine Base on Point Loma and laboratory analysis. Performed Phase I survey and historical resources inventory for the Cabrillo Heights Naval Housing Project. Conducted oral interviews with project architect, tax and title searches, and prehistoric land use research. Completed necessary California Department of Parks and Recreation forms for submittal to the State Historic Preservation Office and contributed to authorship of the report.

Sycuan Hazardous Fuels Reduction
Mr. McGinnis served as project archaeologist for a survey of14-acres of fee-land for the Sycuan Band of Mission Indians. The survey covered an area proposed for hazardous fuels reduction via and firebreak

construction. The project resulted in the discovery of a previously unrecorded archaeological sites. Duties included site recording and report authorship.

Gregory Mountain Traditional Cultural Place
Completed National Register Nomination forms for Gregory Mountain as a traditional cultural place for the Luiseño Native American community, including archival research and co-authoring the report.

County of San Diego Water Authority
Conducted site record and literature searches for multiple projects throughout the county. Directed multiple Phase I surveys and contributed or co-authored multiple reports.

City of San Diego, San Pasqual Valley Leaseholds. Participated in cultural resource surveys of City-owned parcels in the San Pasqual Valley and subsequently participated in the Phase II archaeological testing of prehistoric sites located within the project area. Performed site record, literature, and historic research including tax assessor records, title searches, oral history and biography, for multiple historic cultural resources within the leaseholds in the valley. Completed necessary California Department of Parks and Recreation forms for submittal to the State Historic Preservation Office. Contributed to authorship of the report.

San Diego Wild Animal Park. Participated in the survey, Phase II testing, Phase III data recovery, and lab analysis for multiple sites within the Wild Animal Park leasehold. Contributed to site analyses and final report.

City of San Diego Water and Wastewater Facilities Department. Provided monitoring services for cultural resources during construction trenching operations in several locations for multiple sewer and water pipeline group jobs.

City of Azusa. Performed historic research and inventory of 120 historic properties for evaluation by the City of Azusa. Tasks included, photography, architectural style identification, and archival literature searches.

Barona Indian Reservation. Carried out archival research documenting the history of the Barona Band of Kumeyaay Indians. Covering the period just prior to the eviction from their traditional home at El Capitan to the establishment of the Barona and Viejas reservations. Performed laboratory analysis and cataloguing of extensive collection of prehistoric and historic artifacts purchased for the Barona Museum and Cultural Center.

Ramona Municipal Water District, Mount Woodson Pipeline. Directed Phase I and Phase II testing and evaluation of site in Ramona, CA. Assisted in the laboratory analysis of artifacts. Performed site record and literature research for project's prehistoric and historic components, in addition to historic research of the property. Conducted historic research, including oral interviews, literature searches, and tax and title searches to determine past land use. Completed necessary California Department of Parks and Recreation forms for submittal to the State Historic Preservation Office. Co-authored report.

Campo Reservation Health Clinic
Surveyed and authored the report for the proposed health clinic for the Campo Band Kumeyaay Indians.

Jenney House. Supervised and monitored removal of a 19th century historic home from the Jenney property in Alpine, CA. Conducted shovel test scrapes of area after removal of the building.

Calvary Lutheran Church. Served as crew chief and excavator for Phase III data recovery of ten units in Del Mar, CA. Performed site record and literature search in addition to assisting in the laboratory analysis of artifacts.
Friery Property. Directed Phase II test and evaluation of a site in Ramona, CA. Performed historic research and coauthored report.

San Diego Presidio Archaeology Project. Participated in field excavation and laboratory analysis of Spanish and Mexican period historic artifacts at the San Diego Presidio site, Old Town. Assisted with public education and outreach projects at the excavation.

Santa Barbara Mission. Performed as crew during survey, field excavation, site recording and laboratory analysis of lithic artifacts from the neophyte village at Santa Barbara Mission, Santa Barbara, CA. Participated in recording the historic crypt located beneath the mission.Conducted research using Spanish period records from Mission Santa Barbara archives.

Tubac Presidio Site Field. Performed as crew for excavation and laboratory analysis of prehistoric Hohokam and Spanish Colonial artifacts at the Tubac Presidio site, Tubac, Arizona.

MICHAEL G. BAKSH, PH.D.

Principal Anthropologist/Archaeologist
Tierra Environmental Services

Education

University of California, Los Angeles, Doctor of Philosophy, Anthropology, 1984
University of California, Los Angeles, Master of Arts, Anthropology, 1977
San Diego State University, Bachelor of Arts, Anthropology, 1975

Professional Experience

1993-Present	Principal Anthropologist/Archaeologist, Tierra Environmental Services, San Diego, California
1993-Present	Adjunct Professor, Department of Anthropology, San Diego State University
1990-1993	Senior Anthropologist/Senior Archaeologist, Brian F. Mooney Associates, San Diego, California
1985-1990	Research Anthropologist, University of California, Los Angeles
1980-1985	Consulting Anthropologist, Brian F. Mooney Associates, San Diego, California
1976-1983	Research Assistant, Department of Anthropology, University of California, Los Angeles
1973-1975	Supervisory Archaeologist, San Diego State University, San Diego, California
1970-1973	Assistant Archaeologist, San Diego State University, San Diego, California

Professional Affiliations

Fellow, American Anthropological Association
Member, American Ethnological Society
Member, Association of Environmental Professionals
Member, Society for California Archaeology
President and Trustee, San Diego Archaeological Center
Qualified Archaeologist, County of San Diego
Qualified Principal Investigator, City of San Diego
Qualified EIR Preparer, County of San Diego

Qualifications

Dr. Michael Baksh received his Ph.D. in Anthropology from the University of California at Los Angeles in 1984. He has been Principal Anthropologist/Archaeologist at Tierra Environmental Services for ten years, and was previously associated with Brian F. Mooney Associates as a consultant or employee for over ten years. Dr. Baksh's area of specialty is cultural resource management, and he has conducted numerous archaeological surveys, testing projects, and data recovery programs throughout southern California. He has also conducted numerous Native American consultation and ethnohistoric projects throughout the southwestern United States in compliance with Section 106 of the National Historic Preservation Act. He has established an excellent rapport with Native Americans on a wide range of cultural resource management, land use, and planning projects.

Relevant Projects

As Needed Archaeological Services For The MTDB Light Rail Project *(Metropolitan Transit Development Board).* Dr. Baksh managed the As-Needed archaeological services for the San Diego Metropolitan Transit Development Board (MTDB) in support of construction of the Mission Valley Light Rail Project between Old Town and Fashion Valley. As-needed services included on-going construction monitoring, site testing, and data recovery activities. During the course of monitoring, a buried prehistoric archaeological site was found at a location scheduled for immediate construction. In consultation with the U.S. Army Corps of Engineers (ACOE) and the City of San Diego (City), a testing project was implemented within a matter of days and the site was determined to be significant. Dr. Baksh managed the immediate preparation of an evaluation and treatment plan (for the Heron site, CA-SDI-14,152) and coordination with the ACOE and City. The plan was approved and Dr. Baksh managed the data recovery fieldwork, which was completed in less than one month after initial discovery of the site and just prior to crucial construction deadlines. He subsequently managed all phases of data analysis and preparation of the draft and final reports.

San Diego Water Repurification *(Montgomery Watson).* Dr. Baksh conducted an archaeological feasibility study for the San Diego Water Repurification Project proposed by the City of San Diego Water Utilities Department. This project included analyses of records searches and existing archaeological studies, as well as field reconnaissance studies, for several alternative pipeline conveyance corridors and Advanced Water Treatment Facilities located between the North City Water Reclamation Plant and San Vicente Reservoir.

San Diego Pipelines 4B and 4E *(San Diego County Water Authority).* Dr. Baksh conducted the archaeological survey studies required for these pipeline projects. The cultural resources study for Pipeline 4E included the archaeological testing of a site in Salt Creek to determine site significance. Similarly, the study for Pipeline 4B involved an archaeological test of the historic Mission Flume in Mission Gorge. Both studies involved extensive consultation with Kumeyaay Indians to determine the contemporary significance of prehistoric sites identified in the vicinity of these pipeline routes.

Mt. Israel Reservoir and Pipelines *(Olivenhain Municipal Water District and Bureau of Land Management).* Dr. Baksh served as Senior Archaeologist for preparation of the cultural resources study for this proposed reservoir, flood control channel, and pipeline project in San Diego County. The cultural resource study also included record search analyses and intensive surveys of four alternative access roads. Located in an area traditionally utilized by the Luiseño Indians, this project included ethnohistoric research in addition to the archaeological survey.

Hollister Bridge Replacement *(City of San Diego and Caltrans).* Dr. Baksh conducted the archaeological survey for a proposed bridge construction project that was required after the Tijuana River flooded in 1993 and created a new river channel. The study included a literature search, intensive archaeological field survey, and ethnohistoric research on the village of *Millejo*. As part of the Section 106 process, the study also considered the eligibility status of an existing bridge for nomination to the National Register of Historic Places. Dr. Baksh prepared a Historic Property Survey Report which was submitted by Caltrans to the State Historic Preservation Officer (SHPO) who concurred with its findings.

SDCWA As-Needed Cultural Resources *(San Diego County Water Authority).* Dr. Baksh recently served as the Project Ethnographer on the SDCWA As-Needed Cultural Resource Services contract.

Task orders focused on Native American consultation and ethnographic research related to an archaeological test excavation and subsequent data recovery program at the Harris Site in association with Pipeline 5.

San Diego Pipeline 6 Ethnographic Consultation *(Metropolitan Water District and San Diego County Water Authority).* Dr. Baksh served as Senior Anthropologist for cultural resource investigations conducted for the various alternative routes proposed between Lake Skinner in Riverside County and near Escondido in San Diego County. The project involved extensive Native American consultation, including numerous interviews with Most Likely Descendants from all Luiseño Reservations and input from Cahuilla Indians. Dr. Baksh also conducted intensive ethnohistoric archival research for the study area. Numerous archaeological, ethnohistoric, and contemporarily-significant sites were identified and documented through the Native American consultation program and ethnohistoric research. The findings contributed significantly to the planning process of eliminating and selecting potential alternative routes. Dr. Baksh is currently under contract as Principal Anthropologist for implementation of this project's Mitigation Monitoring Plan.

Caltrans As-Needed Cultural Resource Services *(California Department of Transportation).* Dr. Baksh serves as Principal Anthropologist on the Caltrans District 11 As-Needed Cultural Resources contract, which encompasses San Diego and Imperial Counties. He is responsible for coordinating Native American involvement and input on specific task orders issued under this contract, and is currently developing a comprehensive list of Native Americans capable of providing archaeological monitoring and/or ethnographic consultation services on future Caltrans cultural resource management projects. In consultation with over 20 reservations including Kumeyaay, Luiseño, and Quechan Indians, Dr. Baksh is preparing the list for Caltrans to draw upon during future projects and thereby help ensure compliance Section 106 of the National Historic Preservation Act and other regulations. Development of the list also involves consultation with the Native American Heritage Commission and local cultural resource management firms.

La Jolla Reservation Road *(U.S. Bureau of Indian Affairs).* Dr. Baksh conducted an archaeological study to identify any prehistoric, historic, or other cultural resources that might be affected by the construction of a 1.5-mile-long road. The study included a records search, intensive on-foot examination of the proposed project site and potential alternative sites, and Native American consultation. In compliance with Section 106 of the National Historic Preservation Act, the survey report has been submitted to the State Historic Preservation Officer (SHPO) for concurrence with its findings.

Clean Water Program/Native American Memorandum Of Understanding *(City of San Diego Metropolitan Waste Water Department).* Dr. Baksh prepared a Memorandum of Understanding (MOU) between the Clean Water Program (CWP; currently, Metropolitan Wastewater Department) and Native American groups in San Diego County. The MOU specifies Native American involvement in archaeological investigations and the treatment of archaeological and human remains associated with construction of CWP facilities in San Diego County. Development of the MOU fulfills part of the Programmatic Agreement among the CWP, the Environmental Protection Agency, the Advisory Council on Historic Preservation, and the California State Historical Preservation Officer.

Pala Reservation Fire Presuppression Project *(Pala Band of Mission Indians).* Dr. Baksh conducted archaeological surveys in support of the preparation of an EA for four fire presuppression projects located on the Pala Reservation. The study included a literature searches and intensive archaeological field surveys. An archaeological survey report was prepared and attached to the EA prepared for the project. In compliance with Section 106 of the National Historic Preservation Act, the survey report was submitted to the State Historic Preservation Officer (SHPO) who concurred with its findings.

Gregory Canyon Landfill Ethnohistory and Native American Consultation *(ASM Affiliates).* Dr. Baksh conducted a comprehensive ethnohistory and Native American consultation study for the proposed 1,700-acre Gregory Canyon Landfill site in northern San Diego County. Extensive interviews were conducted with Luiseño elders, religious leaders and cultural resource specialists to document sensitive cultural resources in the project area. An extensive review of primary ethnohistoric materials was also conducted to identify cultural resources previously recorded in the area since the early 1900s. Ethnohistoric resources and ethnographic evidence compiled for the study identified a key place of extremely high cultural significance to traditional Luiseño religious beliefs and practices that may be impacted by the proposed project.

Quien Sabe Ethnography/Ethnohistory *(U.S. Bureau of Reclamation).* Dr. Baksh conducted an ethnographic and ethnohistoric study for the Quien Sabe/Big Maria Terrace area that borders the western side of the Colorado River in Riverside County, California. The study was undertaken for the U.S. Bureau of Reclamation as part of a comprehensive cultural resources study. The project area was previously known to contain intaglio figures or geoglyphs as well as petroglyphs, sleeping circles, trails, and other archaeological features. Dr. Baksh interviewed Quechan (Yuma) and Mohave Indians to elicit Native American knowledge about cultural resources in the project area and to document perspectives regarding the preservation of these resources. Dr. Baksh also performed a comprehensive ethnohistorical literature review in the effort to locate information recorded by anthropologists and other observers of Yuman cultures in the 1800s and early 1900s. The project yielded several important clues that help understand why specific intaglio figures, petroglyphs, and other features were made and what they meant.

Chemgold Native American Consultation *(U.S. Bureau of Land Management).* Dr. Baksh consulted extensively with the Fort Yuma Quechan, Colorado River Indian Tribes (CRIT), and Fort Mohave Tribe to assist the Bureau of Land Management with its Section 106 process for the proposed Chemgold Imperial County Project. The 2,300-acre project site contains numerous sites of high sensitivity to Native American values, including geoglyphs and trail systems. Dr. Baksh assisted in the identification of Native American concerns and values associates with the project area; documented current Native American knowledge about the function and/or interpretation of resources; recorded the meaning and significance of resources to Native Americans; and identified mitigation measures that Native Americans feel would be appropriate to minimize impacts to sensitive cultural resources. The Native American consultation and ethnohistory report was published as part of a joint Environmental Impact Statement/Environmental Impact Report.

APPENDIX B

NATIVE AMERICAN CONTACT LETTERS

TIERRA
ENVIRONMENTAL SERVICES

January 17, 2006

Ms. Rhonda Welch-Scalco, Chairperson
Barona Band of Mission Indians
1095 Barona Road
Lakeside, California 92040

Dear Ms. Welch-Scalco:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). Because we have not contacted you since 1998 on this project, one purpose of this letter is too provide you with a current update. Tierra Environmental Services (Tierra) conducted cultural resource inventories of approximately 37 acres in 1998, 2003, 2004, and 2005 for proposed improvements to a portion of El Camino Real crossing the San Dieguito River Valley, to determine if cultural resources would be impacted. The project crosses the San Dieguito River northeast of Del Mar. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

The cultural resources study is being conducted pursuant to the National Historic Preservation Act (NHPA), California Environmental Quality Act (CEQA) and City of San Diego Guidelines. A records search was conducted and revealed that one previously recorded site CA-SDI-686 Locus C was located within the area of potential effect (APE). The site was previously determined by the City of San Diego not to be significant, and it was not relocated during the surveys conducted in 1998 and 2003. Overall, 33 previous cultural resource studies have been conducted within a one-mile radius of the project area and 55 previously recorded cultural resources have been located within a one-mile radius of the project area. Three sites CA-SDI-14,969, CA-SDI-8,225/H and CA-SDI-10,117 were recorded adjacent to the project area and an effort was made to ensure that these sites did not extend into the APE. All three of these sites were relocated and found to be outside the APE. We are currently preparing a report for this project.

In addition to informing you about this project, a major purpose of this letter is to request any information that you and other tribal elders may have regarding cultural resources located in the vicinity of the project site, pursuant to City Guidelines and Section 106 of the NHPA. Any information you may have about cultural resources on the property would greatly benefit our study.

If you or other tribal members have any knowledge about cultural resources located on the project site, please contact me. If I can provide any additional information, please contact me immediately at (858)578-9064. Thank you for your assistance.

Sincerely,

Michael G. Baksh, Ph.D.
Principal Anthropologist

Enclosures

9915 Businesspark Ave., Suite C, San Diego, CA 92131-1120
Phone: (858) 578-9064 ▲ Fax: (858) 578-3646
E-mail: TierraEnv@aol.com

TIERRA
ENVIRONMENTAL SERVICES

January 17, 2006

Mr. Anthony Pico, Chairman
Viejas Band of Kumeyaay Indians
P.O. Box 908
Alpine, CA 91903

Dear Mr. Pico:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). Because we have not contacted you since 1998 on this project, one purpose of this letter is too provide you with a current update. Tierra Environmental Services (Tierra) conducted cultural resource inventories of approximately 37 acres in 1998, 2003, 2004, and 2005 for proposed improvements to a portion of El Camino Real crossing the San Dieguito River Valley, to determine if cultural resources would be impacted. The project crosses the San Dieguito River northeast of Del Mar. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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TIERRA
ENVIRONMENTAL SERVICES

January 17, 2006

Mr. Mark Romero, Chairman
Mesa Grande Band of Mission Indians
P.O. Box 270
Santa Ysabel, California 92070

Dear Mr. Romero:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). Because we have not contacted you since 1998 on this project, one purpose of this letter is too provide you with a current update. Tierra Environmental Services (Tierra) conducted cultural resource inventories of approximately 37 acres in 1998, 2003, 2004, and 2005 for proposed improvements to a portion of El Camino Real crossing the San Dieguito River Valley, to determine if cultural resources would be impacted. The project crosses the San Dieguito River northeast of Del Mar. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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If you or other tribal members have any knowledge about cultural resources located on the project site, please contact me. If I can provide any additional information, please contact me immediately at (858)578-9064. Thank you for your assistance.

Sincerely,

Michael G. Baksh, Ph.D.
Principal Anthropologist

Enclosures

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E-mail: TierraEnv@aol.com

TIERRA
ENVIRONMENTAL SERVICES

January 17, 2006

Mr. Allen Lawson, Spokesman
San Pasqual Band of Mission Indians
P.O. Box 365
Valley Center, California 92082

Dear Mr. Lawson:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). Because we have not contacted you since 1998 on this project, one purpose of this letter is too provide you with a current update. Tierra Environmental Services (Tierra) conducted cultural resource inventories of approximately 37 acres in 1998, 2003, 2004, and 2005 for proposed improvements to a portion of El Camino Real crossing the San Dieguito River Valley, to determine if cultural resources would be impacted. The project crosses the San Dieguito River northeast of Del Mar. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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Sincerely,

Michael G. Baksh, Ph.D.
Principal Anthropologist

Enclosures

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E-mail: TierraEnv@aol.com

TIERRA
ENVIRONMENTAL SERVICES

January 17, 2006

Mr. Albert Phoenix
Barona Band of Mission Indians
1095 Barona Road
Lakeside, California 92040

Dear Mr. Phoenix:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). Because we have not contacted you since 1998 on this project, one purpose of this letter is too provide you with a current update. Tierra Environmental Services (Tierra) conducted cultural resource inventories of approximately 37 acres in 1998, 2003, 2004, and 2005 for proposed improvements to a portion of El Camino Real crossing the San Dieguito River Valley, to determine if cultural resources would be impacted. The project crosses the San Dieguito River northeast of Del Mar. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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Sincerely,

Michael G. Baksh, Ph.D.
Principal Anthropologist

Enclosures

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E-mail: TierraEnv@aol.com

El Camino Real: Native American Mailing List **1/06**

Ms. Rhonda Welch-Scalco, Chairperson
Barona Band of Mission Indians
1095 Barona Road
Lakeside, CA 92040

Mr. Albert Phoenix
Barona Band of Mission Indians
1095 Barona Road
Lakeside, CA 92040

Mr. Allen Lawson, Spokesman
Attn: Ms. Dorothy Tavui
San Pasqual Band of Mission Indians
P.O. Box 365
Valley Center, CA 92082

Mr. Steve Banegas
Kumeyaay Cultural Repatriation Committee
1095 Barona Road
Lakeside, CA 92040+

Mr. Mark Romero, Chairman
Mesa Grande Band of Mission Indians
P.O. Box 270
Santa Ysabel, CA 92070

Mr. Anthony Pico, Chairman
Viejas Band of Kumeyaay Indians
P.O. Box 908
Alpine, CA 91903

Figure 1
Regional Location Map

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MILES

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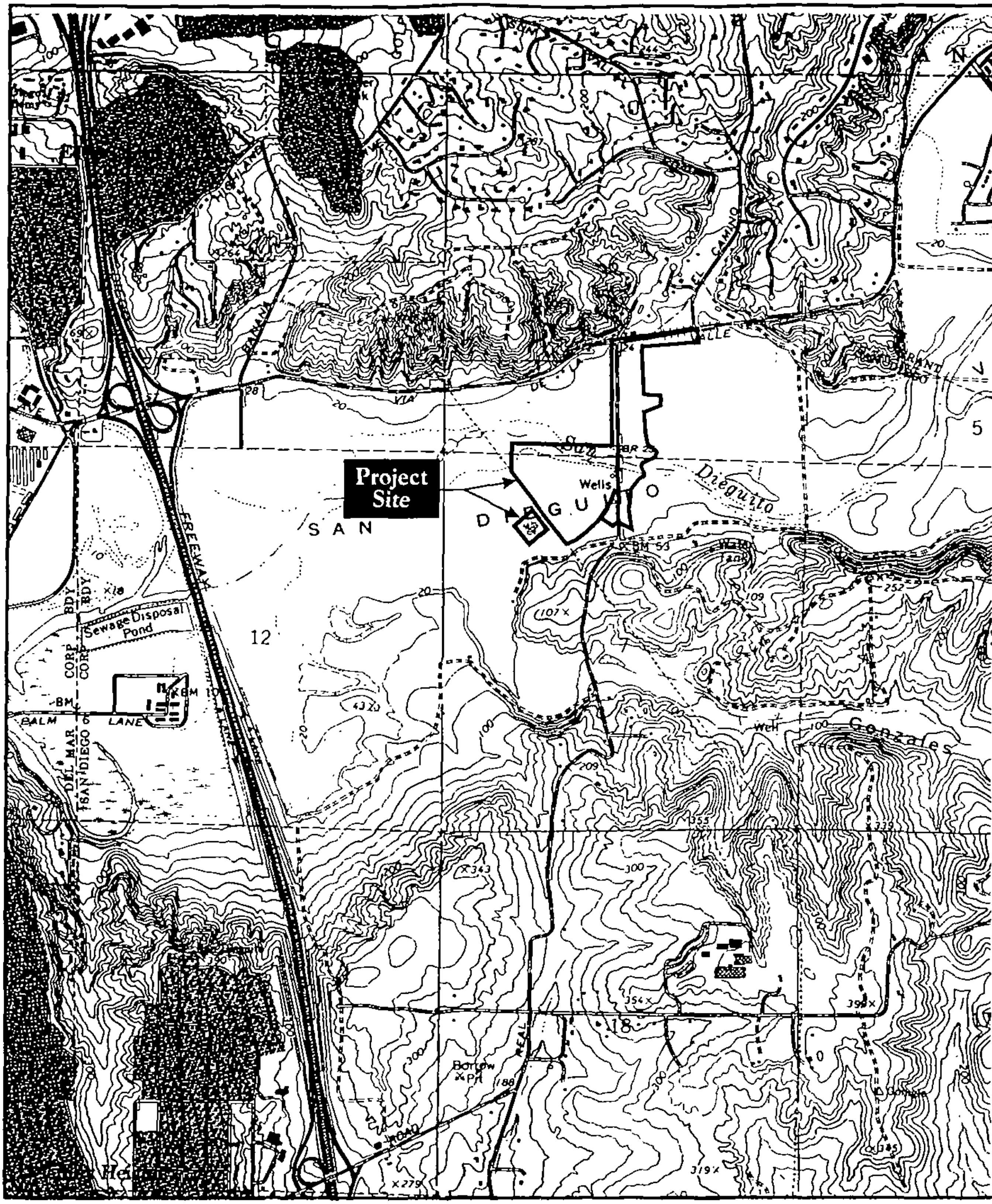

SOURCE: USGS 7.5' Quad Maps (Del Mar 1969 Edition Photorevised in 1975)

Figure 2

Project Location Map

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0 1000 2000

FEET

TIERRA

ENVIRONMENTAL SERVICES

TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Mr. Clifford LaChappa, Chairman
Barona Reservation
1095 Barona Road
Lakeside, California 92040

Dear Mr. LaChappa:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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If you or other tribal members have any knowledge about cultural resources located on the project site, please contact me. If I can provide any additional information, please contact me immediately at 619-578-9064. Thank you for your assistance.

Sincerely,

Michael Baksh

Michael G. Baksh, Ph.D.
Principal Anthropologist

Enclosures

9903-E Businesspark Ave., San Diego, CA 92131-1120
Phone: (619) 578-9064 ▲ Fax: (619) 578-3646

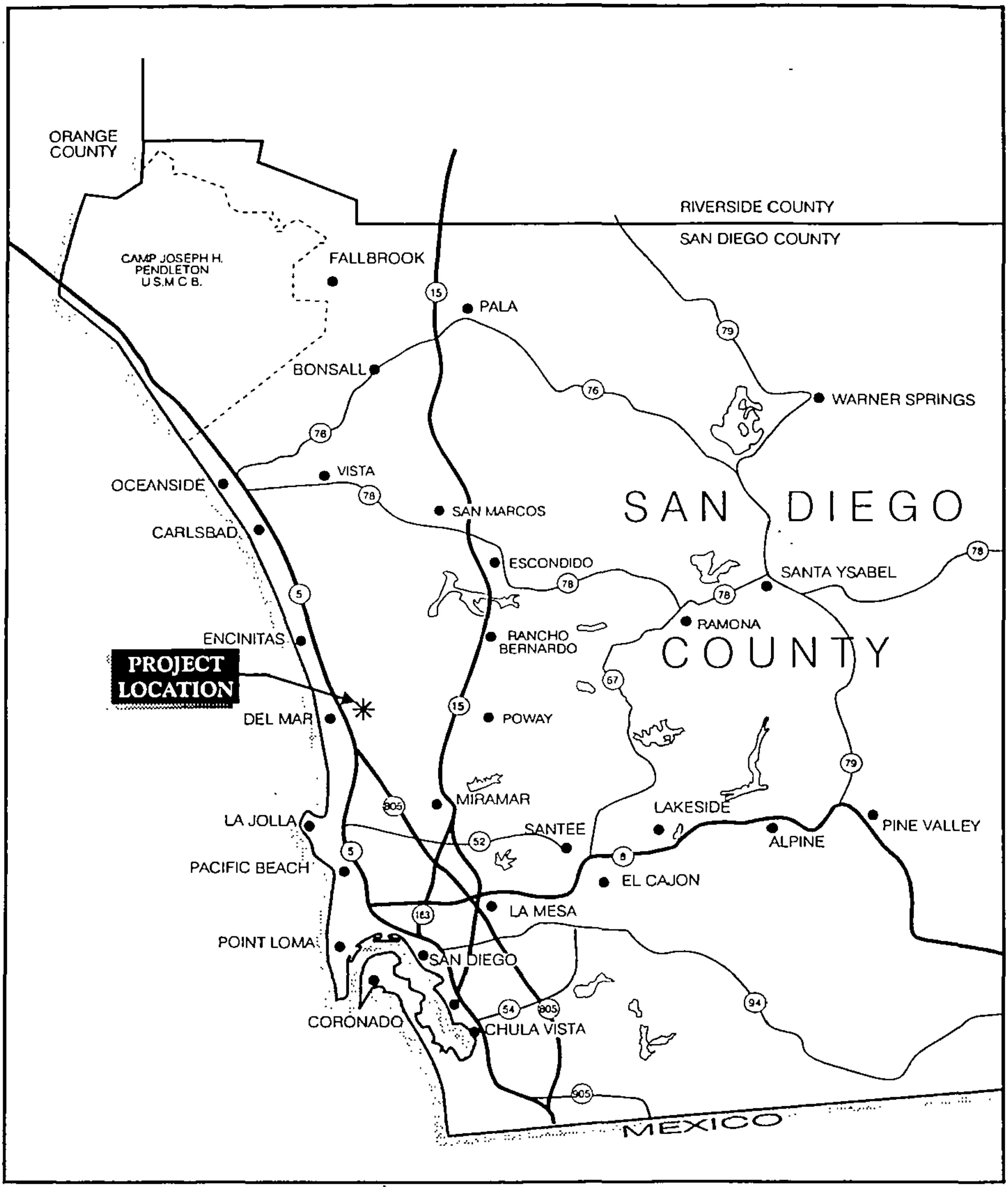

Figure 1
Regional Location Map

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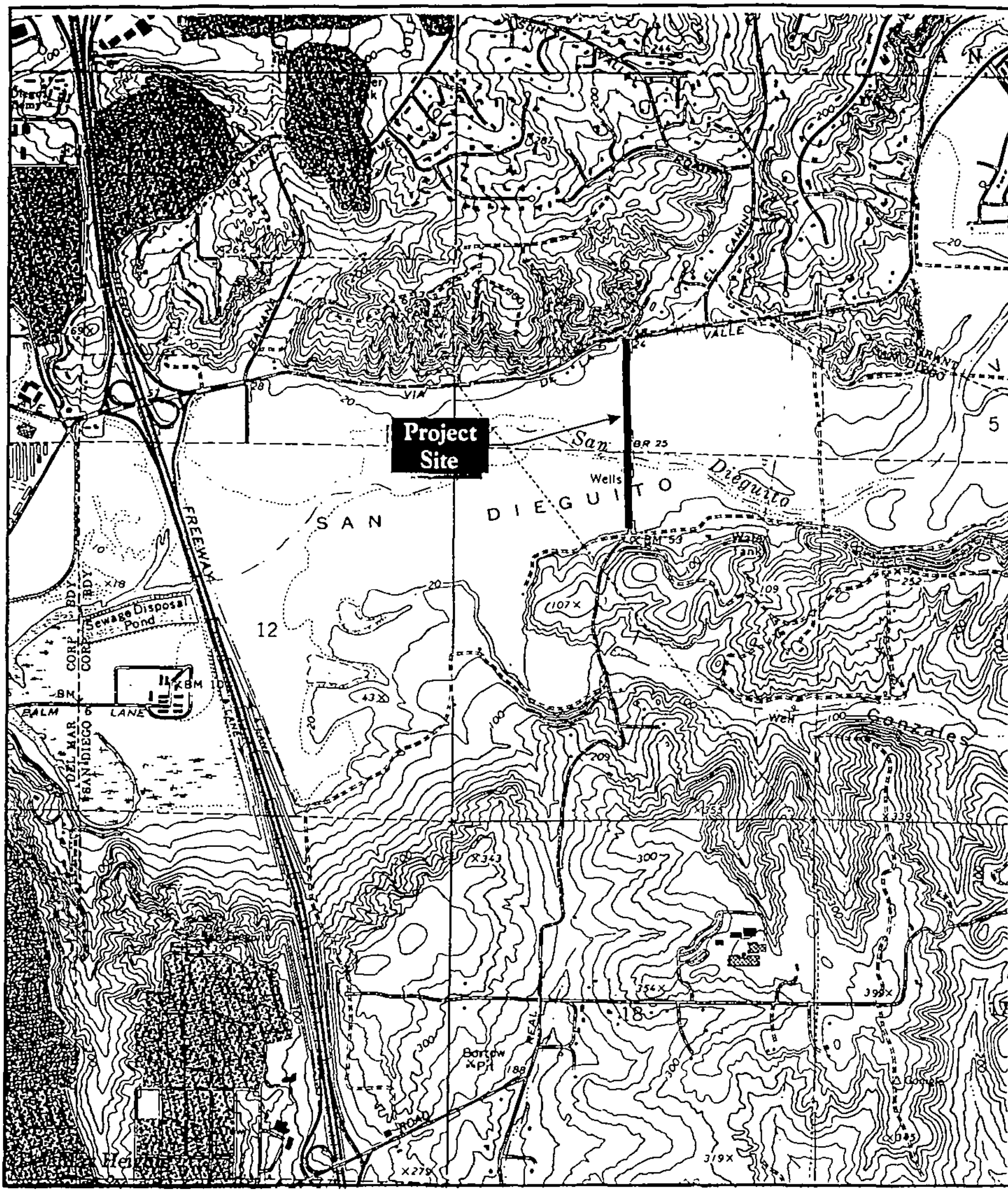

SOURCE: USGS 7.5' Quad Maps (Del Mar 1969 Edition Photorevised in 1975)

Figure 2
Project Location Map

0 1000 2000
FEET

TIERRA
ENVIRONMENTAL SERVICES

El Camino Real Widening: Native American Mailing List **12/11/98**

Mr. Clifford LaChappa, Chairman
Barona Group of the Capitan Grande Band of
Mission Indians
1095 Barona Road
Lakeside, California 92040

Mr. Albert Phoenix
Barona Group of the Capitan Grande Band of
Mission Indians
1095 Barona Road
Lakeside, California 92040

Mr. Ralph Goff, Chairman
Campo Band of Mission Indians
36190 Church Road, Suite 1
Campo, California 91906

Tribal Chairman
Capitan Grande General Council
1095 Barona Road
Lakeside, California 92040

Mr. Tony J. Pinto, Chairman
Cuyapaipe Band of Mission Indians
2271 Alpine Blvd #D
Alpine, California 91901

Ms. Rebecca Maxcy
Inaja & Cosmit Reservation
P.O. Box 186
Santa Ysabel, California 92070

Mr. Kenneth Meza, Chairperson
Jamul Band of Mission Indians
P.O. Box 612
Jamul, California 91935

Ms. Gwendolyn Parada, Chairperson
La Posta Reservation
8 Crestwood Road
Boulevard, California 91905

Ms. Frances Shaw, Chairperson
Manzanita Band of Mission Indians
P.O. Box 1302
Boulevard, California 91905

Mr. Howard Maxcy, Chairman
Mesa Grande Band of Mission Indians
P.O. Box 270
Santa Ysabel, California 92070

Mr. Allen Lawson, Spokesman
Attn: Ms. Dorothy Tavui
San Pasqual Band of Mission Indians
P.O. Box 365
Valley Center, California 92082

Mr. Ben Scerato, Chairman
Santa Ysabel Band of Diegueño Indians
P.O. Box 130
Santa Ysabel, California 92070

Ms. Georgia Kimble, Spokesperson
Sycuan Band of Mission Indians
5459 Dehesa Road
El Cajon, California 92019

Mr. Anthony Pico, Chairman
Viejas Group of Capitan Grande
Band of Mission Indians
P.O. Box 908
Alpine, California 91903

Mr. Clarence Brown
Viejas Group of Capitan Grande
P.O. Box 908
Alpine, California 91903

TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Mr. Ralph Goff, Chairman
Campo Band of Mission Indians
36190 Church Road, Suite 1
Campo, California 91906

Dear Mr. Goff:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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Sincerely,

Michael Baksh

Michael G. Baksh, Ph.D.
Principal Anthropologist

Enclosures

9903-E Businesspark Ave., San Diego, CA 92131-1120
Phone: (619) 578-9064 ▲ Fax: (619) 578-3646

TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Tribal Chairman
Capitan Grande General Council
1095 Barona Road
Lakeside, California 92040

Dear Tribal Chairman:

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Phone: (619) 578-9064 ▲ Fax: (619) 578-3646

TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Mr. Tony J. Pinto, Chairman
Cuyapaipe Band of Mission Indians
2271 Alpine Blvd #D
Alpine, California 91901

Dear Mr. Pinto:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Ms. Rebecca Maxcy
Inaja & Cosmit Reservation
P.O. Box 186
Santa Ysabel, California 92070

Dear Ms. Maxcy:

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If you or other tribal members have any knowledge about cultural resources located on the project site, please contact me. If I can provide any additional information, please contact me immediately at 619-578-9064. Thank you for your assistance.

Sincerely,

Michael Baksh

Michael G. Baksh, Ph.D.
Principal Anthropologist

Enclosures

9903-E Businesspark Ave., San Diego, CA 92131-1120
Phone: (619) 578-9064 ▲ Fax: (619) 578-3646

TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Mr. Kenneth Meza, Chairperson
Jamul Band of Mission Indians
P.O. Box 612
Jamul, California 91935

Dear Mr. Meza:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Ms. Gwendolyn Parada, Chairperson
La Posta Reservation
1064 Barona Road
Lakeside, California 92040

Dear Ms. Parada:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

The cultural resources study is being conducted pursuant to the National Historic Preservation Act (NHPA), California Environmental Quality Act (CEQA) and City of San Diego Guidelines. A records search identified site SDM-W-45 at the northern end of the project and CA-SDI-686 (Locus C) near the southern terminus of the project. A cultural resource survey revealed a light scatter of *Mytilus* shell in the area of SDM-W-45, suggesting that at least a portion of the site still exists. The area of CA-SDI-686 Locus C appears to have been heavily impacted by the previous realignment of El Camino Real, although isolated shell fragments near this location suggest a potential for buried deposits in the area. We are currently preparing a draft report for this project.

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TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Mr. Howard Maxcy, Chairman
Mesa Grande Band of Mission Indians
P.O. Box 270
Santa Ysabel, California 92070

Dear Mr. Maxcy:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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Phone: (619) 578-9064 ▲ Fax: (619) 578-3646

TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Mr. Allen Lawson, Spokesman
San Pasqual Band of Mission Indians
P.O. Box 365
Valley Center, California 92082

Dear Mr. Lawson:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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Michael Baksh

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Principal Anthropologist

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9903-E Businesspark Ave., San Diego, CA 92131-1120
Phone: (619) 578-9064 ▲ Fax: (619) 578-3646

TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Mr. Ben Scerato, Chairman
Santa Ysabel Band of Diegueño Indians
P.O. Box 130
Santa Ysabel, California 92070

Dear Mr. Scerato:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Ms. Georgia Kimble, Spokesperson
Sycuan Band of Mission Indians
5459 Dehesa Road
El Cajon, California 92019

Dear Ms. Kimble:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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Michael Baksh

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Principal Anthropologist

Enclosures

9903-E Businesspark Ave., San Diego, CA 92131-1120
Phone: (619) 578-9064 ▲ Fax: (619) 578-3646

TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Mr. Anthony Pico, Chairman
Viejas Group of Capitan Grande
Band of Mission Indians
P.O. Box 908
Alpine, California 91903

Dear Mr. Pico:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Mr. Clarence Brown
Viejas Group of Capitan Grande
Band of Mission Indians
P.O. Box 908
Alpine, California 91903

Dear Mr. Brown:

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Principal Anthropologist

Enclosures

9903-E Businesspark Ave., San Diego, CA 92131-1120
Phone: (619) 578-9064 ▲ Fax: (619) 578-3646

TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Mr. Albert Phoenix
Barona Indian Reservation
1095 Barona Road
Lakeside, California 92040

Dear Mr. Phoenix:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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TIERRA
ENVIRONMENTAL SERVICES

December 11, 1998

Ms. Frances Shaw, Chairperson
Manzanita Band of Mission Indians
P.O. Box 1302
Boulevard, California 91905

Dear Ms. Shaw:

Our firm has been retained by Earth Tech, Inc. to conduct an archaeological survey for a portion of El Camino Real in the City of San Diego (Figure 1). The proposed project consists of widening El Camino Real to a four-lane road for a length of approximately 0.5 miles between San Dieguito Road and Via de la Valle. The project site is located within Sections 6 and 7, T14S, R3W, of the Del Mar 7.5 minute USGS Quadrangle (Figure 2).

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APPENDIX C

ARCHAEOLOGICAL RECORD SEARCHES

Confidential Appendix Bound Separately

HISTORICAL AND ARCHITECTURAL ASSESSMENT OF THE EL CAMINO REAL BRIDGE (LOCAL AGENCY BRIDGE NO. 57C0042), CITY OF SAN DIEGO

Prepared for:

Tierra Environmental Services
9915 Businesspark Avenue, Suite C
San Diego, California 92131

Prepared by:

Mooney and Associates
9903 Businesspark Avenue, Suite B
San Diego, California 92131

Stacey C. Jordan, Ph.D.
Senior Archaeologist

March 2006

TABLE OF CONTENTS

LIST OF FIGURES

EXECUTIVE SUMMARY

This report presents the findings and recommendations resulting from the historical and architectural assessment of the El Camino Real Bridge (Local Agency Bridge number 57C0042) over the San Dieguito River in the City of San Diego, California. Built in 1940 by the County of San Diego, the resource is a multiple-arch bridge composed of poured concrete. The proposed undertaking involves the widening of El Camino Real between Via de la Valle and San Dieguito Road and widening of the bridge along El Camino Real over the San Dieguito River. The City of San Diego is serving as Lead Agency for CEQA compliance on the proposed undertaking while the Federal Highway Administration (FHWA) is serving as Lead Agency for NEPA compliance. This historical and architectural assessment was prepared at the request of the City of San Diego in accordance with the requirements of the California Environmental Quality Act and with the City of San Diego Historic Resource Guidelines. Mooney and Associates is serving as subconsultant to Tierra Environmental Services, environmental consultant to the project's prime consultant, Earth Tech.

Historical research was conducted by Dr. Stacey C. Jordan, Stacie L. Wilson, and Andrea M. Craft. A records search at the South Coast Information Center at San Diego State University was conducted to identify previously documented resources within one mile of the APE. In addition, California Register of Historical Resources (1976), California Historical Landmarks (1995), California Points of Historical Interest (1993 and updates), and City of San Diego Historical Resources Inventory were consulted. Other resources utilized include the Caltrans Highway Bridge Inventory, the National Register of Historic Places, the Historical American Building Survey/Historic American Engineering Record (HABS/HAER) database, the City of San Diego Streets Division, the City of San Diego Transportation Engineering Department, the San Diego Historical Society, the California Room of the San Diego Public Library Central Branch, the collections of the University of California Los Angeles library system, and historic aerial photographs on file at the County of San Diego Department of Land Use and Planning.

The bridge, constructed in 1940 by the County of San Diego, is a seven-span reinforced concrete arched deck girder structure typical of highway bridge construction in the 1930s and 1940s and still popular today. It was evaluated for significance in 1986 by Caltrans and determined not to be eligible for nomination to the National Register of Historic Places. This evaluation was based on age and architectural and engineering significance. Because this evaluation is more than 10 years old the bridge was reevaluated by Caltrans for significance in September 1998. The bridge was again determined not eligible for nomination to the National Register or the California Register. The research presented here suggests that the bridge does not meet the significance requirements under either California Environmental Quality Act or City of San Diego guidelines. As such, the bridge does not constitute a significant resource and the proposed project will not have a significant adverse effect on a historical resource. California State Department of Parks and Recreation 523 Forms are included in this report as Appendix B.

I. UNDERTAKING INFORMATION/INTRODUCTION

A. Regulatory Background

California state law regarding cultural resources is primarily embodied in Appendix K of the California Environmental Quality Act (CEQA), as amended. According to Appendix K, Section III of CEQA, if a project may affect a historical resource, the lead agency shall determine whether the effect is a significant effect on the environment. Should the project cause damage to an important historical resource, the project may be determined to have a significant effect on the environment.

Additionally, the City of San Diego has adopted the Land Development Code Historic Resources Register Guidelines that further defines requirements for identifying and managing cultural resources. The current study has been performed in compliance with these regulations, with the City of San Diego Significance Determination Guidelines (revised 2004), and with the City of San Diego Historical Resources Board Guidelines.

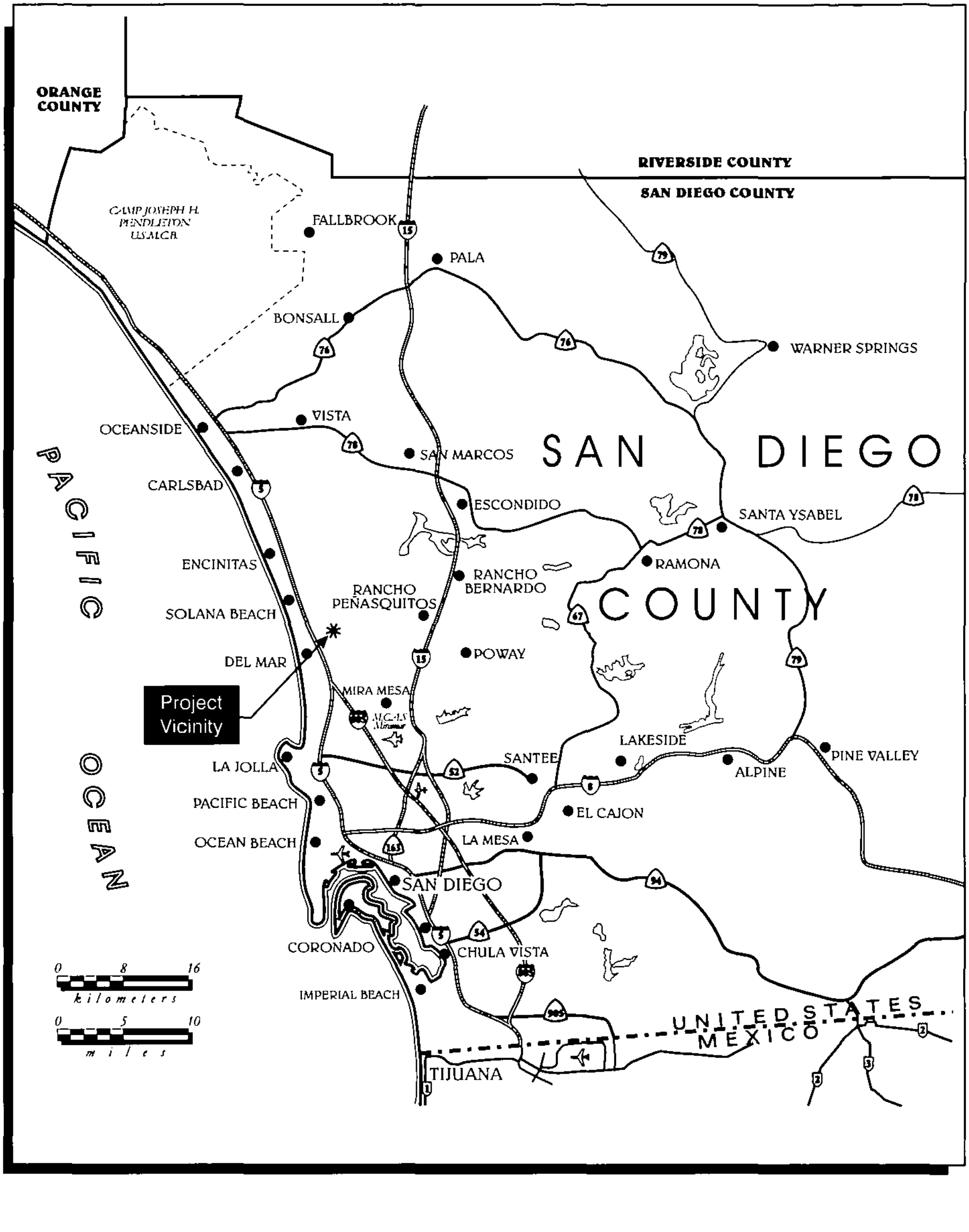
B. Resource Description

The bridge under consideration is located on the northern edge of the City of San Diego between the southern edge of Solana Beach and Rancho Santa Fe (Figure 1). The 340' bridge sits on El Camino Real .3 miles south of Via de la Valle, straddling the northeast 1/4 of the northwest 1/4 of section 7 and the southeast 1/4 of the southwest 1/4 of section 6 of Township 14 South, Range 3 West on the Del Mar 7.5' USGS Quadrangle (Figure 2). The resource consists of a seven-arch, reinforced concrete girder bridge built in 1940 over the San Dieguito River (Local Agency Bridge number 57C0042) (Figure 3).

C. Project Description

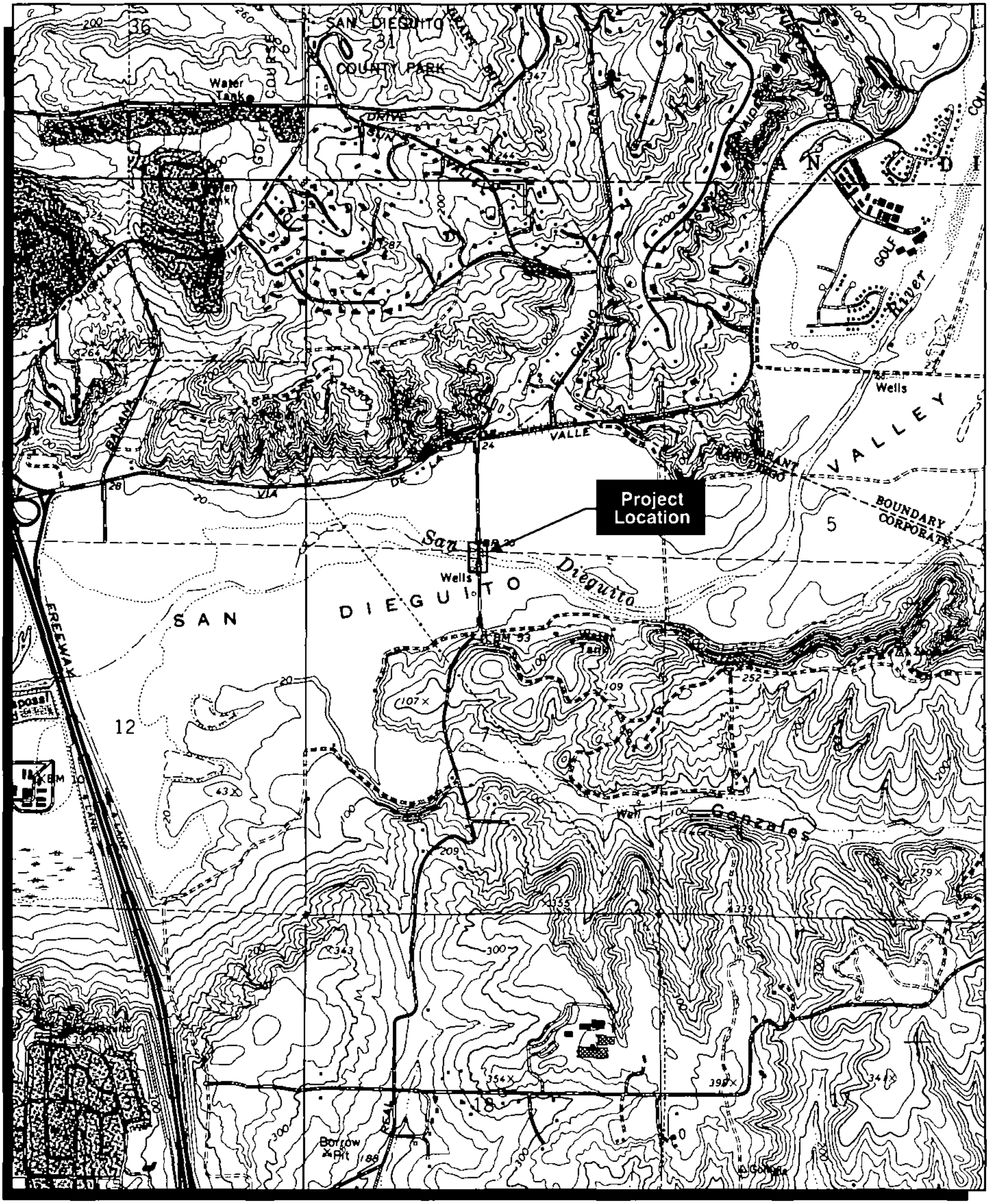
The Central Alignment Alternative proposed for this project would involve the construction of a new bridge and the widening of the existing El Camino Real roadway. The roadway would be widened to 37 m (122 feet) in order to accommodate four travel lanes, bike lanes and a pedestrian walkway/parkway. The entire length of the road would be elevated above the 100-year flood level on 0.6 to 3.0 m (2 to 10 feet) of fill. The Central Alignment alternative also would allow for the construction of a multi-use trail under crossing. This crossing proposed by the Joint Powers Authority (JPA) would consist of a trail platform set at the projected 10-year flood level.

The existing bridge would be demolished and replaced with a box girder structure. The new bridge would be supported by six piers and two abutments.



Project Vicinity

Figure 1



SOURCE: USGS 7.5' Quad Map - Del Mar, CA (1975)

0 1000' 2000'

Project Location

Figure 2

A. East Facade, Looking Northwest

B. Centerline, Looking North

El Camino Real Bridge

Figure 3

The implementation of this alternative would impact sensitive wetland habitats contained in two drainage ditches located adjacent to the proposed project alignment. Consequently, five other alternatives, as described below.

The Eastern Alignment and the Lower Elevation Alternatives include modifications developed to minimize impacts to adjacent recreational land and to minimize visual impacts, respectively. All five variations of the Central Alignment alternative are presented below.

Road Capacity Alternative

This alternative would have a reduced project footprint (18.3 m (60 feet) in width) and an alignment shift to the west to avoid the existing drainage channel that parallels the eastern side of El Camino Real Road. The objective of this variation is to increase road capacity. The project would replace the bridge, raise the road and widen it to 18.3 m (60 feet) to accommodate four traffic lanes. Retaining walls would be required on both sides of the road. At the same time, the parkway, pedestrian walkway, bicycle lanes and median would be eliminated. This alternative would not provide left turn pockets for recreational or commercial facilities located along El Camino Real Road.

Bicycle Safety Alternative

Like the Road Capacity Alternative, this alternative would have a reduced project footprint (18.3 m (60 feet) in width) and an alignment shift to the west to avoid the drainage ditch to the east. However, the focus of this alternative would be to enhance public safety for bicyclists. Thus, the project would include a bridge replacement and raising the road but would accommodate only two traffic lanes. Retaining walls would be constructed on both sides of the raised road. Bicycle lanes and a median would be included in this alternative but the parkway and pedestrian walkway would be eliminated.

Western Alignment Alternative

This alternative would include a bridge replacement and raising and widening the road to 37 m (122 feet). Again, the adjacent drainage ditch would be avoided with an alignment shift to the west. However, in order to accommodate all the proposed components of this variation, additional right-of-way would have to be acquired from the Horse Park and private landowners at Via de la Valle and San Dieguito Road. For this alternative, slopes would be created on both sides of the road.

Eastern Alignment Alternative

This alternative would have the same road width as the Central Alignment Alternative and Western Alignment Alternative. However, for this alternative, the alignment would be shifted to the east to minimize right-of-way requirements from the adjacent Horse Park and to avoid the drainage ditch located directly east of El Camino Real Road. Additional right-of-way would have to be acquired from other landowners adjacent to El Camino Real Road. This alternative would require that the new El Camino Real Road would align with De La Valle Place, thus eliminating the existing intersection at Via de la Valle. Similar to Western Alignment Alternative, slopes would be constructed on both sides of the road for this alternative.

Lower Elevation Alternative

This alternative was developed to address concerns regarding visual impacts resulting from the proposed improvements to El Camino Real Road. This alternative would involve the same horizontal alignment and project features as the Central Alignment Alternative and would be 37 m (122 feet) in width. This alternative would raise the bridge just enough to accommodate the 100-year flood. At this lower elevation, the bridge would not accommodate the JPA multi-use trail under crossing that was proposed on a platform above the estimated 10-year flood level. However, the crossing of the river bed by equestrians would not be affected.

II. SETTING

A. Natural Setting

The bridge is location in the northern portion of the City of San Diego in the San Dieguito River valley, at an elevation of approximately 25 feet above mean sea level and led to by low grade approach embankments. This segment of El Camino Real is located approximately 1.25 miles east of Interstate 5 and .3 miles south of Via de la Valle, and is accessible from the east and west from Via de la Valle and from the south from San Dieguito Road. The bridge crosses the San Dieguito River in the Holocene alluvial plain of the valley floor consisting of sediments from the San Dieguito River floodplain. On either side of the valley are the sedimentary marine terraces dominating the coastal plain. The alluvial valley is dominated by Tujunga sand, 0 to 5% slopes (TuB). Low annual rainfall limits vegetation growth in this region's Mediterranean climate. In and adjacent to the bridge are Diegan coastal sage scrub, mulefat scrub, freshwater marsh, southern coastal salt marsh, coastal brackish marsh, and ruderal fields. Developed areas and agricultural fields also occur near the bridge. Open water/freshwater marsh is present within the San Diego River channel. Water flow varies seasonally, with open water present in the channel during the relatively wet winter season; freshwater marsh vegetation is dominant during the drier spring and summer seasons. Regional fauna include deer, fox, raccoon, skunk, bobcat, coyotes, rabbits, as well as various species of rodents, reptiles, and birds. Small game is relatively abundant.

B. Cultural Setting

Beginning with Rogers (1939), a variety of regional chronologies have been proposed for southern coastal California. Indeed, a proliferation of named "cultures," "complexes," "traditions," "stages," and "periods" characterize previous research (Meighan 1954; Moriarty 1966; Rogers 1945; True 1958, 1966, 1970; Wallace 1955, 1978; Warren 1968). Despite this apparent terminological confusion, there is general agreement on the major temporal units for the region. The prehistory of San Diego County can be divided into three temporal periods: Paleoindian, Archaic, and Late Prehistoric (Bull 1983; Ezell 1987; Moriarty 1966; Warren 1987).

The antiquity of human occupation in the New World has been the subject of considerable hemisphere-wide debate over the last few decades, and a number of sites have been suggested to represent very early occupation of the Americas. The currently accepted model is that humans first entered the western hemisphere between 12,000 and 15,000 before present (BP). While there is no firm evidence of human occupation in the southern coastal California prior to 12,000 BP, the possibility has intrigued a number of investigators, and dates of 48,000 BP and 23,000 BP have been reported (Bada et al. 1974; Carter 1980; Rogers 1966). The technique employed to date these sites (amino acid racemization), however, has been largely discredited by recent Accelerator Mass Spectrometry (AMS) radiocarbon dating of early human remains along the California coast (Taylor et al. 1985). Despite such intensive interest and a long history of research into the early occupation of North America, no firm, widely-accepted evidence dating prior to 15,000 BP has emerged.

The Paleoindian period, dating from 12,000 to 8,000 BP, is typified by artifact assemblages termed the San Dieguito complex (Moratto 1984; Warren et al. 1993). Malcolm Rogers (1966), who first described the San Dieguito complex, felt it extended from Oregon to mid-Baja California. The San Dieguito complex is considered to represent generalized hunter-gatherers, and is primarily characterized by flaked lithic tools such as scrapers, scraper planes, choppers, and large projectile points (Davis et al. 1969; Warren 1987). Sites are documented in inland and coastal areas of San Diego County during a climatic period of cooler and moister conditions than presently exist. Pinion-juniper forests and riparian communities along watercourses and lake shores in the deserts were more widespread, and the hunting of deer and smaller game is considered central to the San Dieguito economy, although undoubtedly many plant foods were also gathered. The absence of a milling technology was, until recently, seen as the major differentiation between the San Dieguito and later Archaic period complexes.

The Archaic period (also referred to as the Millingstone horizon or La Jolla complex) persisted at least 7,000 years ago, possibly beginning as early as 9,000 BP. Archaic shell middens are well documented all along the northern San Diego County coast (Moratto 1984:146-151). Traditionally, the Archaic adaptation is considered to have differed from the previous San Dieguito adaptation by being more focused on gathering activities that emphasized marine mollusks, fish, and plant resources, along with small to large mammals. Occupation was heaviest along the coast and major drainage systems extending inland. The coastal Archaic sites (often termed the La Jolla complex) are characterized by shell middens, cobble tools, basin metates, manos, discoidals, and flexed burials. Early Archaic occupations have burials dispersed within the occupation areas, while later occupations have separate cemetery areas.

In the inland area of northern San Diego County, True identified a number of Archaic period sites with artifact assemblages distinct from coastal Archaic sites (True 1958, 1980; True and Beemer 1982). These sites, termed the Pauma complex, were typically on small saddles and hills overlooking drainages, and were characterized by basin and slab metates, manos, scraper planes, a small number of Pinto and Elko series points, and debitage. Recently, the Pauma complex has been characterized as an inland counterpart of the coastal La Jolla complex (Cárdenás and Van Wormer 1984; Gallegos 1987; True and Beemer 1982). Given the limited distance between these two different environmental contexts (coastal and inland) and possible contemporaneity in occupation, these sites may represent seasonal manifestations of a single Archaic settlement system.

The subsequent Late Prehistoric period in San Diego County differs from the Archaic period in the occurrence of small, pressure flaked projectile points, the replacement of flexed inhumations with cremations, the introduction of ceramics, and an emphasis on inland plant food collection, processing, and storage, especially of acorns. Around 2,000 BP, Yuman-speaking people from the eastern Colorado River region may have begun migrating into southern California, although few incipient Late Prehistoric sites dating to this period have been found. An intrusion of Shoshonean-speakers occurred in the northern part of San Diego County after 1,500 BP Inland semi-sedentary villages were established along major water courses, and mountain areas were seasonally occupied to exploit acorns and pinon nuts, where settlements are associated with milling stations at bedrock outcrops.

The Late Prehistoric period begins between 1,500 and 1,000 years BP, in western San Diego County (Moriarty 1966; Warren 1968). Terms used to designate the Late Prehistoric assemblages in this area include the Yuman Complex, the Cuyamaca Complex, the Hakataya Tradition, and the Patayan Tradition (May 1978; Rogers 1945; Schroeder 1979; True 1970; Waters 1982). Late Prehistoric sites are characterized by ceramics; small Cottonwood Triangular, Desert Side-notched, and Dos Cabezas Serrated projectile points; obsidian from the Obsidian Butte source in Imperial County; human cremations; and the mortar and pestle. These sites are often attributed to the ethnographic Kumeyaay.

Early ethnographers employed the term Diegueño when referring to the Yuman-speaking population inhabiting portions of southern Alta California and northern Baja California during the late prehistoric and early historic eras (Map II-1). The term results from the coerced affiliation of a large part of this cultural group with the Mission San Diego de Alcalá established in 1769. Throughout the twentieth century various anthropologists, using generalized ethnographically documented territories and geographical variations, employed various subdivisions when discussing these people. This situation is complicated by the fact that while the Diegueño recognized their collective similarity in speech and custom as opposed to surrounding societies, they had no all-inclusive name they recognized for themselves as a single people. In this discussion, the term "Kumeyaay" will be used to refer to the groups that existed in the vicinity of the project.

There seems to have been considerable variability in the level of social organization and settlement variability. The Kumeyaay were organized by patrilineal, patrilocal lineages that claimed prescribed territories, but did not own the resources except for some minor plants and eagle aeries (Luomala 1976; Spier 1923). Some of the lineages occupied procurement ranges that required considerable residential mobility, such as those in the deserts (Hicks 1963). In the mountains, some of the larger groups occupied a few large residential bases that would be occupied biannually, such as those occupied in Cuyamaca in the summer and fall, and in Guatay or Descanso during the rest of the year (Almstedt 1982; Rensch 1975). According to Spier (1923), many eastern Kumeyaay spent the spring to autumn in larger residential bases in the upland procurement ranges, and wintered in mixed groups in residential bases along the eastern foothills on the edge of the desert (i.e., Jacumba and Mountain Springs). This variability in settlement mobility and organization reflects the great range of environments in the territory.

Acorns were the most important single food source used by the Kumeyaay. Their villages were usually located near water necessary for leaching acorn meal. Other storable resources such as mesquite or agave were equally valuable to groups inhabiting desert areas, at least during certain seasons (Hicks 1963; Shackley 1984). Seeds from grasses, manzanita, sage, sunflowers, lemonadeberry, chia, and other plants were also used along with various wild greens and fruits. Deer, small game, and birds were hunted, and fish and marine foods were eaten. Houses were arranged in the village without an apparent pattern. The houses in primary villages were conical structures covered with tule bundles, having excavated floors and central hearths. Houses constructed at the mountain camps generally lacked any excavation, probably due to the summer occupation. Other structures included sweathouses, ceremonial enclosures, ramadas, and acorn granaries. The material culture included ceramic cooking and storage vessels, basketry, flaked lithic and ground stone tools, arrow shaft straighteners, and stone, bone, and shell ornaments.

Hunting implements consisted of the bow and arrow, curved throwing sticks, nets, and snares. Shell and bone hooks, as well as nets, were used for fishing. Lithic resources of quartz and metavolcanics were commonly available throughout much of the Kumeyaay territory. Other materials, such as obsidian, chert, chalcedony, and steatite, occur in more localized areas and were acquired through direct procurement or exchange. Projectile points included the Cottonwood Series points, as well as Desert Side-notched points, both commonly produced.

Kumeyaay culture and society remained stable until the advent of missionization and displacement by Hispanic populations during the eighteenth century. The effects of missionization, along with the introduction of European diseases, greatly reduced the native population of southern California. By the early 1800s California was under Mexican rule. The establishment of ranchos under the Mexican land grant program further disrupted the way of life of the native inhabitants.
San Diego's historical period technically begins in 1542 when the first Europeans explored what was then known as San Miguel Bay under Juan Rodriguez Cabrillo. In 1602, Sebastian Vizcaino retraced Cabrillo's route, renaming the bay San Diego de Alcala for the Saints' Day on which he arrived (Pryde 1992:6).

Changes in the cultural and geographic landscapes of San Diego, however, can truly be considered to begin on July 16, 1769, with the founding of the joint mission and Royal Presidio. Subsequently, the Mission reestablished at its current location in 1774. Although the Royal Presidio was a fortified site, its location precluded it from effectively defending the bay from foreign intrusion. Instead, it was designed to protect the settlers from land attacks, principally from Native Americans.

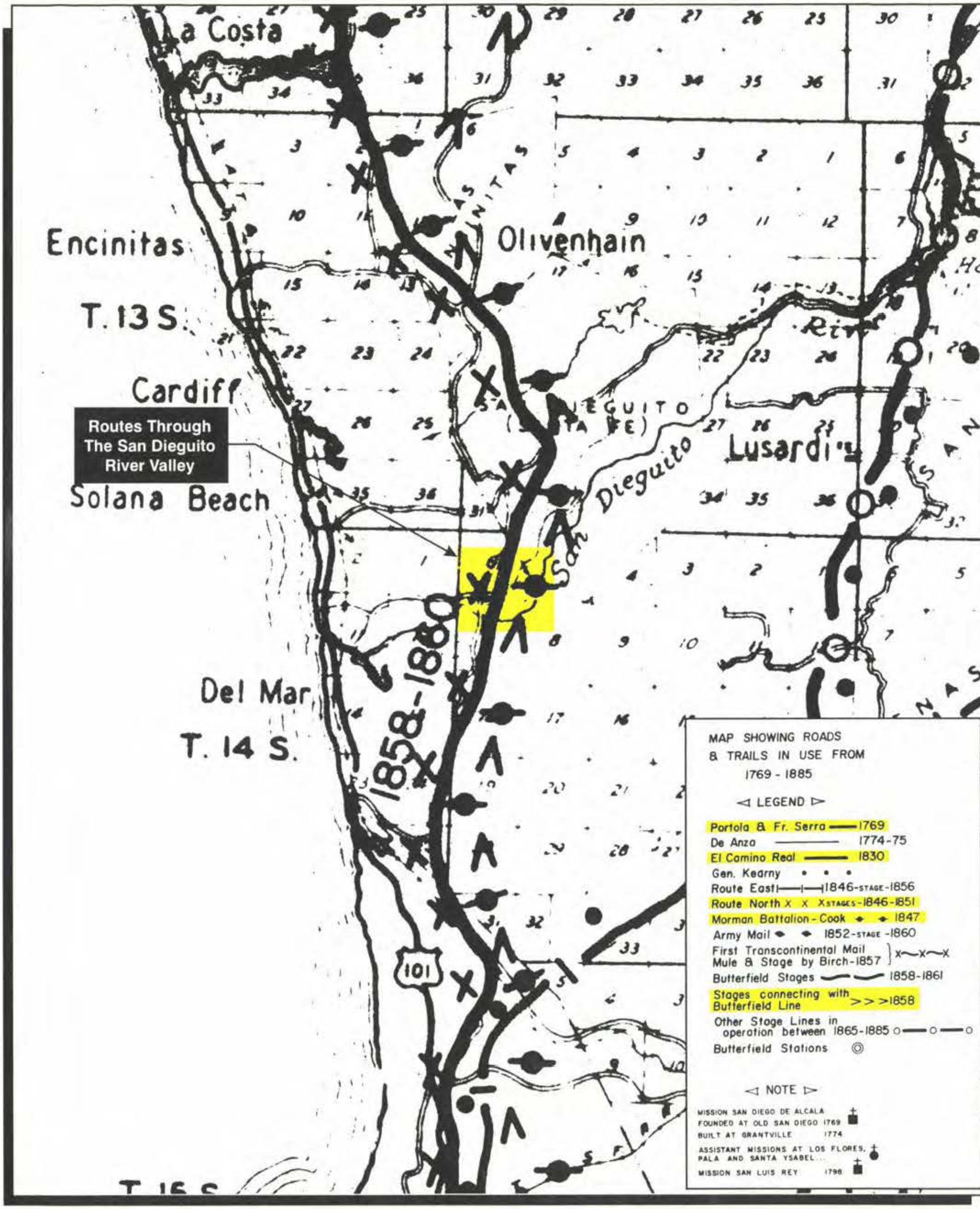
Early historic contact in the project area is documented in the records of Don Gaspár de Portolá's 1769 expedition up the California coast to Monterey to identify locations for future missions and presidios. The Portolá expedition consisted of 63 men, including Franciscan Father Juan Crespí, cartographer Miguel Costansó, and Spanish officers and soldiers. Following established trails north from the Native American village of Cosoy at Presidio Hill on July 14th, the expedition reached the San Dieguito Valley the following day, camping "near a large pool of fresh water west of present day El Camino Real" (Carrico 1977:34). South of the camp among a concentration of fresh water pools was a large Kumeyaay village. After exchanges and interaction with the Kumeyaay, the expedition left the next day, following the route of today's Camino Viejo.

Portolá's route was used in subsequent years by Franciscan Padre Junipero Serra as he spearheaded the establishment of presidios, missions, and pueblos from San Diego to Sonoma. Following California's admission to the United States in 1850, the well-worn El Camino Real served as the main north-south stage route (Figure 4; Forbes 1915, Corle 1949, Riesenberg 1962). By 1898, as seen on an official County of San Diego map, El Camino Real through the project area was set in its present orientation and length (Figure 5). Today, much of El Camino Real throughout the state been incorporated into much of the length of US Highway 101, though the segment within the project area was to the east of the highway. At present, the segment of El Camino Real within the project area consists of an eponymous raised, medium-duty, paved two-lane city road over the San Dieguito River.

Mexican Rancheros inhabited the region surrounding the project area until California became a state in 1850. Juan Maria Osuna was granted two square leagues of land (8,824.71 acres) by the Governor Pio Pico in 1845, though he lived on the land as early as 1836. A Californio, Osuna was one of the early settlers of San Diego, serving as the first *Alcalde* or Mayor in 1835 and *Juez de Paz* (Justice of the Peace) in 1839-40 and 1846 before dying in c.1847 (San Diego Historical Society 2003). The project area lies outside the southwest corner of the Rancho San Dieguito, whose 8,824.71 acres were later officially deeded by the United States Government to Juliana L. Osuna and family on April 18, 1871 (California State Archives 2000: MC 4:4-183). By 1872, the area of the San Dieguito River Valley between the ocean and the Rancho was occupied by 6 property owners.

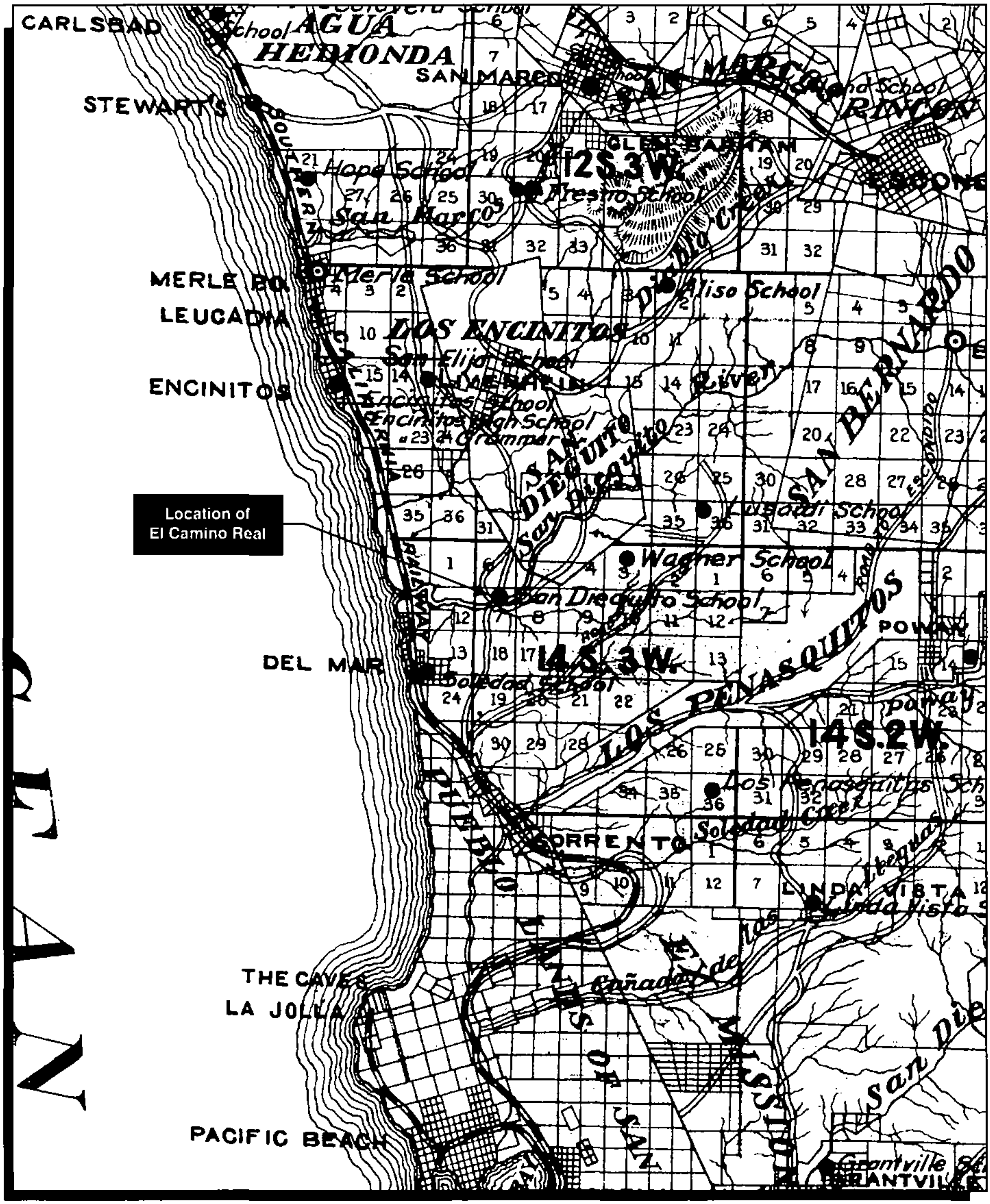
Until the late 1800's, the river valley sustained ranches and agriculture. At the same time, the coastal area was being used for recreation, including the tent city of "Del Mar" owned by Ella and Theodore Loop which lent its name to the later development. Loop worked for the California Southern Railroad which came to Del Mar in 1882 and spurred subdivision of the area by Loop and his partner Jacob Taylor (Solana Beach Real Estate 2003). A railroad bridge west of the APE crossed the San Dieguito River as early as 1881, though it had been declared unsafe by1883 (Bronson 1968:43; San Diego Union 1882, 1883). By 1903, only three residential structures are shown on the La Jolla 15' Quadrangle, one on either side of San Dieguito Road east of El Camino Real and one southeast of the intersection of San Dieguito Road and El Camino Real. El Camino Real is also well established on this map. A bridge is represented on the map, but the river route runs to the north of its present course (Figure 6). The 1916 flood washed out existing highway bridges over the San Dieguito River, and led to the construction of the Lake Hodges dam, completed two years later, to manage the flow down the valley (Bronson 1968:51).

Residential and recreational development in the area began in earnest in the late 1920s, when San Diego Gas and Electric brought electricity to the area. A bridge over the San Dieguito River on El Camino Real is visible in the 1928 San Diego County aerial photograph of the project area (Figure 7). Over the course of the twentieth and early twenty first centuries, the river valley underwent a transformation from a primarily agricultural area, to an area of mixed development, including small businesses and strip malls along Via de la Valle, equestrian facilities on San Dieguito Road and in the river valley, remnant agricultural fields to the west of the bridge, and a new golf course to the east of the structure.

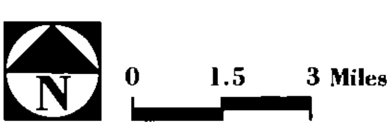


San Diego County, CA Map Showing Roads & Trails in Use from 1769-1885 (1955, San Diego County Assessor)

Figure 4



Official Map of San Diego County, CA
Compiled from Official Records &
Private Sources (1898)
Figure 5



SOURCE: USGS

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Not to Scale

1903 La Jolla 15' USGS Quadrangle

Figure 6

SOURCE: San Diego County Office of Land Use & Planning

Not to Scale

1928 San Diego County Aerial

Figure 7

III. RESEARCH DESIGN AND METHODS

A. Research Design

Research for this project consisted of performing literature and archival searches at the appropriate resource data repositories to provide background information on the El Camino Real Bridge (Local Agency Bridge number 57C0042). A physical survey and inspection of the project property including photographic documentation was also undertaken.

B. Methods

Historical research was conducted by Dr. Stacey C. Jordan, Stacie L Wilson, Andrea M. Craft. A records search at the South Coast Information Center at San Diego State University was conducted to identify previously documented resources within one mile of the APE. In addition, California Register of Historical Resources (1976), California Historical Landmarks (1995), California Points of Historical Interest (1993 and updates), and City of San Diego Historical Resources Inventory were consulted. Other resources utilized include the Caltrans Highway Bridge Inventory, the National Register of Historic Places, the Historical American Building Survey/Historic American Engineering Record (HABS/HAER) database, the San Diego Historical Society, the City of San Diego Street Services Division, the California Room of the San Diego Public Library Central Branch, the collections of the University of California Los Angeles library system, and historic aerial photographs on file at the County of San Diego Department of Land Use and Planning.

Field survey of the property placed emphasis on documenting the physical integrity and architectural elements of the structure, and placing the resource in the context of the area's development. The bridge was documented using 35 mm color print film; negatives are on file at Mooney & Associates. Appropriate Department of Parks and Recreation forms were also completed and are attached as Appendix B.

IV. REPORT OF FINDINGS

A. Literature and Records Search Results

The project APE includes a portion of the historic path of El Camino Real traversed by Spanish explorer Gaspar de Portola's 1769 expedition. El Camino Real has been designated California Registered Historical Landmark No. 784. The section of El Camino Real within the APE retains its integrity of location, but no longer retains integrity of setting as the valley has become increasingly developed.

A bridge crosses the San Dieguito River within the project APE and is known as the El Camino Real Bridge (57C0042). This bridge was built in 1940 and is of historic age. The bridge was evaluated for significance in 1986 by Caltrans and determined not to be eligible for nomination to the National Register of Historic Places. This evaluation was based on age and architectural and engineering significance. Because this evaluation is more than 10 years old the bridge was reevaluated by Caltrans for significance in September 1998. The bridge was again determined not eligible for nomination to the National Register or the California Register. It is currently undergoing a new evaluation by Caltrans District 11 staff.

The present bridge was built by the County of San Diego in 1940 (Appendix C). While present at the time of the 1945 US Navy Mosaic aerial photograph of the area, it is not clearly shown (Figure 8). The presence of the bridge is more clearly indicated on the 1953 AXN aerial photograph of the project area, though details of its appearance and integrity are not apparent (Figure 9). The multi-span bridge is also barely visible in aerial photos of Del Mar made in 1960 (Figure 10). In 1966, alterations were made to the bridge's original engineering (see discussion below). A 1970 aerial photograph clearly shows the present bridge and illustrates the design of its superstructure (Figure 11). The segment of El Camino Real south of the bridge was realigned in 1986. To ease the eastbound approach from San Dieguito Road, El Camino Real was curved westward to replace the then-existing perpendicular intersection of the two thoroughfares.

In the winter of 1979-1980, the bridge was damaged by rain and partially destroyed (Evening Tribune 1980). Negatives from photos taken for an Evening Tribune report on the damage, on file at the San Diego Historical Society, show an end span of the bridge washed down the river channel; a print of the photo is not available. In October 1989, in response to that month's earthquake in Northern California's Bay Area, the San Diego Reader identified the El Camino Real bridge as one of the thirteen San Diego bridges "best avoided during a seismic event" (Potter 1989). The following month, the San Diego City Council voted to fund improvement and reinforcements for the El Camino Real bridge, among other city-owned bridges.

B. Field Survey Results

The El Camino Real bridge is a 340' seven-span, reinforced concrete arched deck girder structure with cantilevered end spans (see Figures 3 and Appendix C). The bridge has two 13' abutment cantilevers, two 42' end spans, and 5 46' intermediate spans. Designed by Donald R. Warren, a Los Angeles-based structural engineer, for the County of San Diego, it replaced a 171' pile trestle bridge in the same location. The bridge's reinforced concrete girder construction represents a type popular for highway bridge construction in the 1930s and 1940s and still in use today. This type became popular as a result of the simplicity of its construction, but generally has poor seismic resistance (Structsource 2003).

SOURCE: San Diego County Office of Land Use & Planning

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Not to Scale

1945 US Navy Mosaic Aerial Photograph

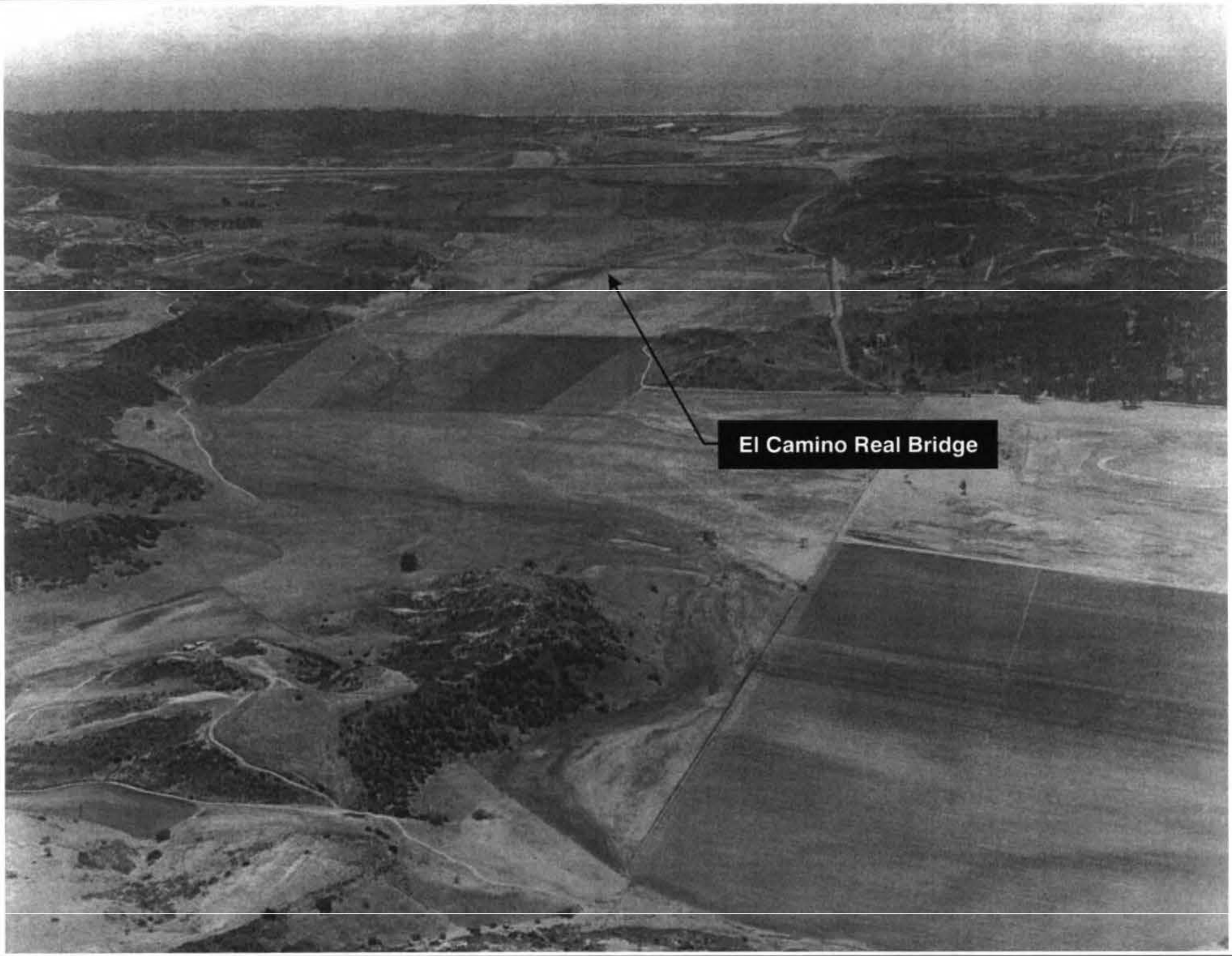
Figure 8

SOURCE: San Diego County Office of Land Use & Planning

Not to Scale

1953 AXN Aerial Photograph

Figure 9



SOURCE: Photo S-7959-18, San Diego Historical Society, Photograph Collection

Not to Scale

1960 Del Mar Aerial Photo

Figure 10

SOURCE: Photo S-7959-24, San Diego Historical Society, Photograph Collection

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Not to Scale

1970 Aerial Photograph

Figure 11

The central arch span of the bridge has reinforced concrete crossbeams perpendicular to the arched girders. The bridge rests on concrete abutments and is reached on long, low grade approach embankments on El Camino Real. The abutment embankments are held with rock and wire revetment. The bridge deck measures 15' from the bottom of the river channel to the low end points of its arched girders.

The bridge is 26' 8" wide with a 24' roadway (Figure 12). The overhanging deck, on a 1% slope from center, has a raised 1' by 1' concrete curb on either edge but lacks sidewalks. A timber post and sheet metal approach guardrail leads to a painted wooden timber railing approximately 3' high. The railing has 8" by 8" posts with 1" chamfer tops and ¼" chamfer corners, and a single recessed 4" by 4" rail. The railing is attached to the deck by galvanized carriage bolts with cut washers. Posts are spaced every 6' on the end spans and 6 to 6 7/8" on intermediate spans.

In 1966, the bridge bearings were reconstructed by the City of San Diego (Appendix D). Three existing rockers were replaced with new expansion plate assemblies and the original expansion joint in span 4 was replaced with an expansion dam. No drawings illustrating the reconstruction activities following the 1979-1980 damage were found during research at the Transportation Engineering Department.

A. Timber Railing

B. Approach Guardrail

El Camino Real Bridge

Figure 12

V. DISCUSSION AND INTERPRETATION

The current project falls under state legislative jurisdiction and the lead reviewing agency is the City of San Diego. California state law regarding cultural resources is primarily embodied the California Environmental Quality Act (CEQA), as amended. According to Appendix K, Section III of CEQA, if:

> ...a project may affect an archaeological resource, the agency shall determine whether the effect may be a significant effect on the environment. If the project may cause damage to an important archaeological resource, the project may have a significant effect on the environment.

Additionally, the City of San Diego has adopted the Historical Resources Guidelines that further defines requirements for identifying and managing cultural resources. The current study has been performed in compliance with these regulations, with the City of San Diego Significance Determination Guidelines (revised 2004), and with the City of San Diego Historical Resources Board requirements.

A. CEQA Significance

Section 15064.5 of CEQA provides definitions of significance and types of impacts to archaeological and historical resources. As cited in this section, the lead agency shall consider a resource to be 'historically significant' if the resource meets the California Register of Historic Resources criteria for eligibility or is listed in a local historic register or deemed significant in a historical resource survey. According to the California Register criteria, a significant historical resources is one which:

A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

B. Is associated with the lives of persons important in our past;

C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

D. Has yielded, or may be likely to yield, information important in prehistory or history

Further, CEQA emphasizes that evaluations of buildings and structures take into consideration the additional elements of age, location, context, association, uniqueness, and integrity.

Criterion A. The El Camino Real bridge, while crossing a historically significant path that is related to the early Spanish colonization of California, is not itself associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage. As such, it is not significant under criterion A.

Criterion B. The bridge was constructed by the County of San Diego, and there is no indication that the El Camino Real bridge is associated with the lives of persons important in our past. Therefore, it is not eligible under criterion B.

Criterion C. While the reinforced concrete girder bridge was typical of highway bridge construction in the 1930s and 1940s, the El Camino Real bridge does not embody characteristics of a type, period, region, or method of construction which make it a distinctive example significant under CEQA. Further, modifications have been made to its original engineering with the 1966 replacement of existing rockers and the central expansion joint with new plate assemblies and expansion dam. Original materials were also modified as a result of storm damage which destroyed an end portion of the bridge in 1979-1980. In addition, it does not represent the work of an important creative individual, or possess high artistic values, and therefore is not eligible under criterion C.

Criterion D. Archival and field research suggest that the El Camino Real bridge is not likely to yield important historical information, and is not significant under criterion D.

The El Camino Real bridge is over 45 years of age and therefore meets the age requirements for eligibility under CEQA. It remains in its original location and context bridging the depth of the San Dieguito River valley. However, the association with its surroundings has been altered due to the increasing development of the areas immediately adjacent to the river channel as well as the adjacent river valley area. The bridge is a typical structure for its date and does not represent a unique resource. Further, while it maintains aesthetic integrity, some of its original materials and engineering have been replaced as a result of replacements made in 1966 and in response to the damage which occurred in 1979-1980.

B. City of San Diego Significance

Additional guidance is provided by the City of San Diego Significance Determination Guidelines (2004). As outlined in the City of San Diego's Significance Determination Guidelines under the California Environmental Quality Act (1991), the City of San Diego Historical Resources Board may designate an object as historic if it meets any of the following criteria:

A. Exemplifies or reflects special elements of the City's, a community's or a neighborhood's historical, archaeological, cultural, social, economic, political, aesthetic, engineering, landscaping or architectural development;

B. Is identified with persons or events significant in local, state or national history;

C. Embodies distinctive characteristics of a style, type, period or method of construction or is a valuable example of the use of indigenous materials or craftsmanship;

D. Is representative of the notable work of a master builder, designer, architect, engineer, landscape architect, interior designer, artist or craftsman;

E. Is listed on or has been determined eligible by the National Park Service for listing on the National Register of Historic Places or is listed or has been determined eligible by the California OHP for listing on the State Register of Historic Resources; or

F. Is a finite group of resources which relate to one another in a clearly distinguishable way; or is a geographically definable area or neighborhood containing improvements which have a special character, historical interest or aesthetic value; or which represent one or more architectural periods or styles in the history and development of the City.

Similar to CEQA, the City of San Diego guidelines emphasize that resource evaluations take into consideration the criteria of age, location, context, association, uniqueness, and integrity (please see discussion under CEQA above).

Criterion A. The El Camino Real bridge does not in itself represent or reflect any special elements of the development of the City of San Diego or its respective communities. A bridge over the San Dieguito River was continuously present along this stretch of El Camino Real as early as 1903, and likely earlier, and the present structure merely reflects the continuation of the access over the river provided along that route. As such, it is not significant under criterion A.

Criterion B. The bridge was constructed by the County of San Diego, and there is no indication that the El Camino Real bridge is associated with the lives of persons important in local, state or national history. Therefore, it is not considered eligible under criterion B.

Criterion C. The reinforced concrete girder El Camino Real bridge represents a common type of standard highway bridge construction during the 1930s and 1940s, and one which remains popular today. It does not, however, embody identifiably distinctive characteristics of a style, type, period of construction. While illustrating the concrete arched deck girder method of construction, it is not a unique or special example of the method, which is well represented in mid- to late-twentieth century highway bridges of California as well as other states. In addition, it is not a valuable example of the use of indigenous materials or craftsmanship. Further, modifications have been made to its original engineering with the 1966 replacement of existing rockers and the central expansion joint with new plate assemblies and expansion dam. Original materials were also modified as a result of storm damage which destroyed an end portion of the bridge in 1979-1980. As such, it is not considered eligible under criterion C.

Criterion D. Built by the County of San Diego, the El Camino Real bridge is not representative of the notable work of a master builder, designer, architect, engineer, landscape architect, interior designer, artist or craftsman, and is not eligible under criterion D.

Criterion E. The El Camino Real bridge has been evaluated twice by Caltrans for National Register eligiblity and has been found ineligible. The bridge is not listed on and has not been determined eligible by the National Park Service for listing on the National Register of Historic Places, and is not listed nor has been determined eligible by the California OHP for listing on the State Register of Historic Resources. El Camino Real has been designated a California Registered Historic Landmark (No. 784). The route retains integrity of location, which is its character-defining feature. However, integrity of setting, feeling and association have been diminished by the development of the paved road itself, as well as the general development of the San Dieguito Valley. As such, it is not eligible under criterion E.

Criterion F. The El Camino Real bridge is not part of a finite group of resources which relate to one another in a clearly distinguishable way; or is a geographically definable area or neighborhood containing improvements which have a special character, historical interest or aesthetic value; or which represent one or more architectural periods or styles in the history and development of the City. Therefore, it is not eligible under criterion F.

Given the results of the archival and field research in the context of CEQA and City of San Diego resource significance criteria, the El Camino Real bridge does not qualify as a significant historical resource under either State or City guidelines.

VI. MANAGEMENT CONSIDERATIONS

The fact that there has been a bridge in this location for over 100 years is significant, but the project proposes to replace the bridge with a new bridge which will maintain the continuity of a bridge being in this location. Evaluation of the El Camino Real Bridge over the San Dieguito River (Local Agency Bridge Number 57C0042) indicates that the resource is over 45 years of age. The alterations made to the bridge in the last 20 to 30 years have changed it so that it no longer retains integrity. The bridge does not meet the significance criteria outlined in the California Environmental Quality Act and the City of San Diego significance guidelines. As such, implementation of the proposed project and its variations will not result in adverse impacts to significant National Register, California Register, or City of San Diego eligible resources and no mitigation is recommended.

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1989 "Can Spans Stand Shake?" San Diego Reader, 10/26/89, p. 5.

Riesenberg, Felix, Jr.
1962 The Golden Road: The Story of California's Spanish Mission Trail. New York: McGraw-Hill Book Company, Inc.

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2003 "San Diego Biographies: Juan Maria Osuna." From William Ellsworth Smythe's *History of San Diego* (1907), p. 171. Available at: www.sandiegohistory.org/bio/osuna/osuna.htm. Retrieved 7/11/03.

San Diego Evening Tribune

1980 Evening Tribune Photo Assignment, 8/20/1980. On file in the "Bridges" Vertical File at the San Diego Historical Society.

San Diego Union

1882 "Bridge Across San Dieguito River." 12, 14, 82 3:1. On File in the Newspaper Index at the California Room of the San Diego Public Library.

1883 "San Dieguito New Bridges Unsafe" 1, 18, 83 3:1. On File in the Newspaper Index at the California Room of the San Diego Public Library.

1989 "Council panel Oks speeding up quakeproofing of city bridges." 11/14/89, B-3.

Solana Beach Real Estate

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Structsource

2003 "RC T-Girder." Available at: www.structsource.com/highwaybridge/types/rctee.htm. Retrieved 10/14/03.

APPENDIX A

PERSONNEL QUALIFICATIONS

Stacey C. Jordan, Ph.D.

Senior Archaeologist and Historian
Resource Management Division

Years of Experience
10

Mooney & Associates

Education

Doctor of Philosophy, Anthropology, Rutgers University, New Brunswick, New Jersey
Master of Philosophy, Anthropology, Rutgers University, New Brunswick, New Jersey
Master of Arts, Anthropology, Rutgers University, New Brunswick, New Jersey
Bachelor of Arts, Anthropology, University of California, Berkeley

Dr. Jordan has been involved in the fields of archaeology and history for over a decade. Her specialty in historical archaeology combines the use of material culture and the archival record in anthropologically driven analyses of cultural resources. The recipient of the Excellence Fellowship at Rutgers University as well as two Predoctoral Research Fellowships from the Wenner-Gren Foundation for Anthropological Research, Dr. Jordan is the author of various publications as well as numerous papers presented at national and international conferences. She is particularly well-versed in the analysis of historical ceramics and has taught courses in the method and theory of historical archaeology as well as in the identification and analysis of historical ceramics and glass. She has extensive experience in archival research and historical writing, and has worked on projects spanning from early colonial contact to the recent past, with particular emphasis on community development, identity construction, and slavery in colonial South Africa. Dr. Jordan has served on a variety of prehistoric and historic excavations both in the United States and abroad.

Relevant Projects

Fine Medical Building, San Diego, California. Historical and architectural evaluation of the Fine Medical Building. Conducted historical and archival research on the building and its architect, Sim Bruce Richards. Photographed and documented the building according to Office of Historic Preservation guidelines, prepared State of California Department of Parks and Recreation forms, and assessed resource significance according to California Environmental Quality Act criteria and City of San Diego Significance Guidelines.

Oak Glen Land Exchange, San Bernardino, California. Conducted historical research on early settlement in San Bernardino National Forest area. Supervised evaluation and documentation of four twentieth-century cabin structures and associated features. Resources inventoried according to State of California Department of Parks and Recreation forms and assessed according to National Register of Historic Places.

San Gabriel Mission Trencb, San Gabriel, California. Conducted historical and archival research on the prehistory and history of the San Gabriel Mission and surrounding areas to assess potential impacts of proposed below-grade railway trench. Compiled historical narrative, identified potential subsurface features, and recommended appropriate mitigation strategies.

PromiseLand Project, Campo, California. Conducted archival and historical research regarding settlement of the Campo area, San Diego County. Documented and evaluated two historic structures according to State of California Department of Parks and Recreation forms and California Environmental Quality Act criteria.

Park/Laurel Project, San Diego, California. Conducted archival and historical research on the settlement and development of Banker's Hill/Balboa Park West neighborhood in the City of San Diego. Examined diverse records on the subject property, and excavated and documented on-site subsoil features.

Harbor Island Police Station, Port of San Diego. Historical and architectural evaluation of the Harbor Island Police Station for the Port of San Diego. Conducted historical and archival research on the building and its architect, William Templeton Johnson. Photographed and documented the building according to Office of Historic Preservation guidelines, prepared State of California Department of Parks and Recreation forms, and assessed resource significance according to California Environmental Quality Act criteria and City of San Diego Significance Guidelines.

Abraham Lincoln High School Expansion Project. Historic study and architectural inventory of Abraham Lincoln High School and adjacent Lincoln Park areas. Conducted historical and archival research on the community and high school, photographed and documented all historic resources, prepared State of California Department of Parks and Recreation forms, and assessed resource significance according to California Environmental Quality Act criteria and City of San Diego Significance Guidelines.

High Winds Project, Solano County. Conducted archival and historical research on the settlement and development of southern Solano County. Evaluated nine historic resources and surrounding landscape significance according to California Environmental Quality Act criteria. Completed historical background and assessment report, photographically documented resources and landscape, and updated California Department of Parks and Recreation forms for previously identified resources.

Azusa General Plan Update. Assessed historic structures, identified historic districts and community boundaries. Assisted in developing historic resources management plans to aid in economic and social revitalization of Azusa neighborhoods and commercial districts.

Draper Avenue Historical Assessment. Documented and evaluated historic residence in the community of La Jolla. Prepared California Department of Parks and Recreation forms and assessed resource's historical and architectural significance according to California Environmental Quality Act criteria.

Home Avenue. Assisted in interpretation and analysis of historic residential material culture excavated in downtown San Diego.

Luther Burbank Elementary School Expansion Project. Ongoing historic study and architectural inventory of Barrio Logan area adjacent to Luther Burbank Elementary School. Involves historical and archival research on the community and its history, photography and documentation of historic resources, preparation of State of California Department of Parks and Recreation forms, and assessment of resource significance according to California Environmental Quality Act criteria and City of San Diego Significance Guidelines.

Valley View Project. Conducted archival research on early settlement in Escondido and San Pasqual areas. Supervised excavation of three early twentieth-century historic residences and outlying areas. Resources inventoried according to State of California Department of Parks and Recreation forms. Wrote historical analysis of findings and conducted site assessment according to California Environmental Quality Act criteria.

Woods Valley. Documented and evaluated two historic archaeological sites in Valley Center area. Conducted historical research on settlement and land use to contextualize sites. Completed California Department of Parks and Recreation forms for submittal to the State Historic Preservation Officer.

Los Angeles Bridges. Documented and evaluated three historic bridges in Studio City, Los Angeles County. Completed archaeological and historic properties resources reports and bridge evaluation report according to Caltrans format.

Rainbow Flow Control Facility. Conducted cultural resource survey for proposed flow control facility near Rainbow, northern San Diego County. Involved site record and literature searches relating to prehistoric and historic occupation in area.

Hayward Executive Airport. Historic resources inventory and National Register evaluation of historic properties at the Hayward Executive Airport and Air National Guard Station facilities. Conducted thorough historical and archival research on the properties, photographed and documented all potentially significant resources, prepared State of California Department of Parks and Recreation historic inventory forms, and assessed resource significance according to National Register eligibility criteria.

City of San Diego San Pasqual Leaseholds. Ongoing historic resource identification, documentation, and evaluation of buildings on city-owned parcels in San Pasqual Valley. Involves site record and literature searches, archival research, and oral histories relating to multiple late nineteenth- and early twentieth-century historic structures in the valley. Resources inventoried according to State of California Department of Parks and Recreation forms for submittal to the State Historic Preservation Officer.

Metromedia Fiber Optic Project: San Diego, San Francisco, and Los Angeles. Archival research and National Register evaluation of identified historic properties and archaeological sites relating to fiber optic conduit installation in the San Diego, Los Angeles, and San Francisco areas.

South Napa River Tidal Slough and Floodplain Restoration Project. Identification, documentation, and evaluation of historic farm buildings along South Napa River according to National Register criteria. Report prepared for the City of American Canyon.

Sutherland Dam Bridge. Documentation and evaluation of a historical bridge in San Diego County according to CEQA criteria, prepared for the City of San Diego Water Department. The project involved research of historic literature and photographs for preparation of the state approved ARMR format report.

Vieques Research Project. This project involved the recording and excavation of numerous pre-Columbian and Spanish colonial sites on the island of Vieques, Puerto Rico to document and conserve cultural resources in areas being relinquished by the Navy. Additional responsibilities included the cataloging and laboratory analysis of pre-Columbian ceramic collections excavated from the island during current and previous projects, as well as the supervision of laboratory staff involved in the project.

Burkittsville Monitoring. Served as archaeological monitor during trench excavations for new water pipelines in the historic downtown of Burkittsville, Maryland.

Avra Valley Survey. Surveyed area of northern Sonoran desert in Avra Valley, Arizona. This project involved locating and recording prehistoric Hohokam features and artifacts in areas of forthcoming development.

Jerome Area Survey. Surveyed 300 acres of historical mining facilities and outlying areas near Jerome, Arizona. This project involved the photography and documentation of historic structures, landscape surveys, and the location and mapping of prehistoric and historic occupations during Phase I investigations.

Kfar HaHoresh. Served as excavator on the prehistoric mortuary site of Kfar HaHoresh in the Nazarene Hills, Lower Galilee, Israel. This project involved the documentation and excavation of human and animal burials, as well as the identification and mapping of associated mortuary goods and features.

Oudepost I Project. Participated in the survey and excavation of the eighteenth-century coastal outpost of Oudepost I on Saldanha Bay, Cape Province South Africa. This project involved delineating the extent of the site and locating rubbish deposits in tidal areas near the mercantile outpost.

Cedarberg Mountain Rock Art Survey. Participated in survey to locate and record prehistoric and historic Khoi rock art sites in the Cedarberg Mountains, Cape Province, South Africa.

Flowerdew Hundred. Served as excavator on seventeenth- and eighteenth-century colonial sites outside of Hopewell, Virginia. This project involved the survey, excavation and mapping of residential and commercial establishments located in an early English settlement along the James River.

Professional Affiliations
World Archaeological Congress
Society for American Archaeology
Register of Professional Archaeologists

Professional Experience

2001-Present	Senior Historian and Archaeologist, Mooney & Associates, San Diego, California
1999-2000	Laboratory Analyst, R. Christopher Goodwin & Associates, Frederick, Maryland
1999	Archaeologist, Aztlan Archaeology, Tucson, Arizona
1999	Archaeologist, Desert Archaeology, Tucson, Arizona
1997-1998	Instructor, Rutgers University, New Brunswick, New Jersey

APPENDIX B

DEPARTMENT OF PARKS AND RECREATION
523 FORMS

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #:
HRI #:
Trinomial:
NRHP Status Code:

Other Listings:
Review Code: Reviewer: Date:

 Resource Name or #: El Camino Real between San Dieguito Road and Via de la Valle

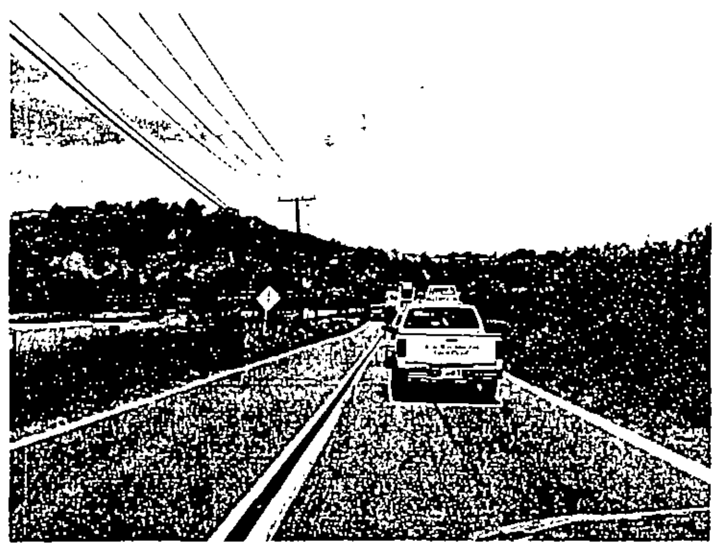
P1. Other Identifier: El Camino Real

P2. **Location**: ☐ Not for Publication ■ Unrestricted **a. County**: San Diego, CA
b. **USGS 7.5' Quad**: Del Mar, CA Date: 1994
T 14S ; R 3W; portion of NE ¼ of SW ¼ of Sec 6, SE ¼ of SW ¼ of Sec 6 & NE ¼ of NW ¼ of Sec 7; S.B.B.M.
c. Address: N/A City: San Diego, CA Zip: 92130
d. UTM: N/A
e. Other Locational Data: Section of historic El Camino Real located between San Dieguito Road and Via de la Valle, east of Interstate 5.

P3a. **Description**: El Camino Real is an approximately 700 mile route consisting of portions of I-280, Route 82, Route 238, US 101, I-5, Route 72, Route 12, Route 37, Route 121, Route 87, Route 162, Route 185, Route 92, and Route 123 and connecting city streets and county roads stretching from Sonoma, California to the Mexican border. As such, its physical characteristics vary greatly over its route. The section documented here is a .54-mile portion of the original path of Don Gaspár de Portolá's 1769 expedition up the California coast to Monterey to identify locations for future Spanish missions and presidios. By 1898, as shown on an official County of San Diego map, this stretch of El Camino Real was set in its present north-south orientation and length. This section of El Camino consists of an eponymous medium-duty, paved two-lane city road over the San Dieguito River; the road is currently elevated on trapezoidal fill to a height of 17 feet.
S

P3b. **Resource Attributes**: (HP37) Highway/Trail

P4. **Resources Present**: ☐ Building ☐ Structure ■ Object ☐ Site ☐District ☐Element of District ☐ Other:



P5a. Photograph or Drawing

P5b. Description of Photo:
Looking north, 6/11/03, 883-Dscn0324

P6. **Age and Sources**: ■ Historic ☐Prehistoric ☐Both:
The resource is considered here to date to 1769, the documented date of Portolá's expedition along this section of El Camino Real.

P7. **Owner and Address**: City of San Diego
Department of Transportation, Street Division
2781 Caminito Chollas
San Diego, CA 92105

P8. **Recorded by**:

Stacey C. Jordan
Mooney & Associates
9903 Businesspark Avenue
San Diego, CA 92131

P9. **Date Recorded**: 6/11/03

P10. **Survey Type**: Intensive Pedestrian

P11. **Report Citation**: None

Attachments: ☐NONE ■Location Map ☐Sketch Map ☐Continuation Sheet ■ Building, Structure, and Object Record ☐Archaeological Record ☐District Record ■ Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐Other:

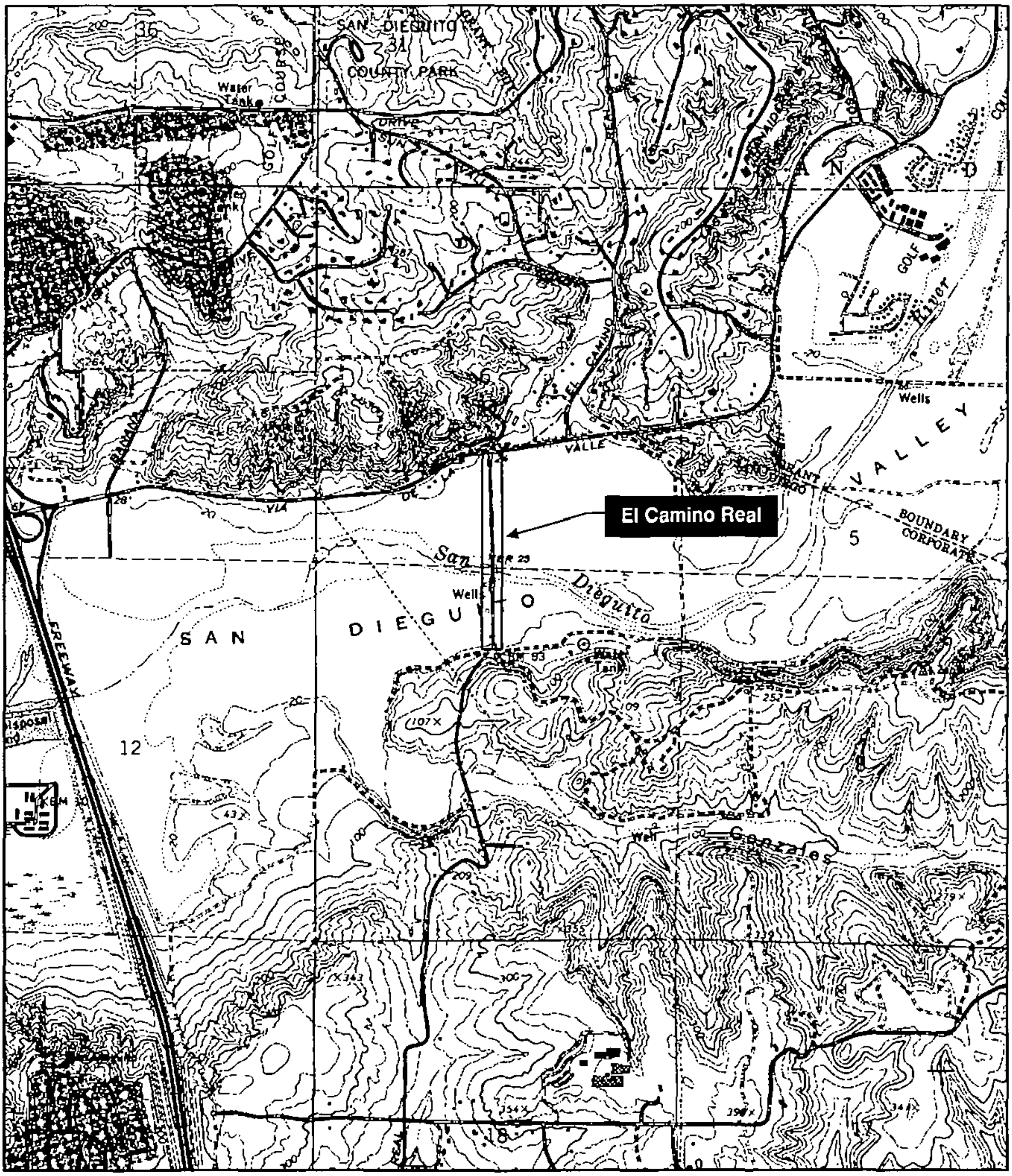
State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary #:
Trinomial:

LOCATION MAP

Resource Name or #: El Camino Real

Map Name: Del Mar, CA **Scale:** 1:24,000 **Date of Map:** 1975



State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
BUILDING, STRUCTURE, AND OBJECT RECORD

Primary #: ______________________
Trinomial: ______________________

NRHP Status Code: 3S

Resource Name or #: El Camino Real between San Dieguito Road and Via de la Valle

B1. Historic Name: El Camino Real

B2. Common Name: El Camino Real

B3. Original Use: Trail

B4. Present Use: Paved city road

B5. Architectural Style: Linear earthwork with paved roadbed

B6. Construction History: see Continuation Sheet

B7. Moved? ■ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A

B8. Related Features: None.

B9a. Architect: Unknown b. Builder: City of San Diego

B10. Significance: Spanish Colonization & Development of the Mission System
Theme: Early Exploration and Colonization of California
Area: California
Period of Significance: 1750-1800 **Property Type:** Highway/Trail
Applicable Criteria: A

Numerous general histories of El Camino Real have been conducted, but this study did not yield any specific information on previous documentation or evaluation of this specific segment of the route. Given the results of the current research, this resource is best evaluated in the state-level historic context of Early Exploration and Colonization of California (1750-1800), particularly as it represents Spanish Colonization & Development of the Mission System. The resource as a whole appears eligible for the National Register as a result of its association with events that have made a significant contribution to the broad patterns of our national history, namely the expeditions of Spanish explorers and missionaries that led to the colonization of California. However, outside of this event, it is not directly associated with the lives of persons significant in our past; does not embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values; and does not appear likely to yield information important in prehistory or history. With the road following the original route in the .54-mile segment between Via de la Valle and San Dieguito Road, the route retains integrity of location, which is its character-defining feature. However, integrity of setting, feeling and association have been somewhat diminished due to development of the paved road itself, as well as general the development of the San Dieguito Valley; workmanship and materials of the existing road date to a later period than that in which the resource is being evaluated. El Camino Real associated with events surrounding early Spanish exploration and colonization that have made a significant contribution to the broad patterns of California's and the Nation's history and cultural heritage (Criterion A).

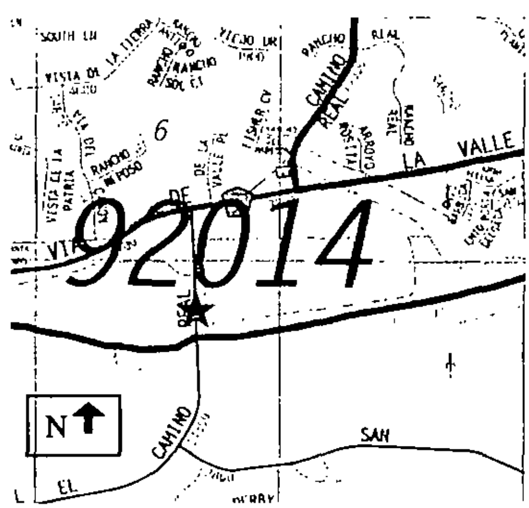
B11. Additional Resource Attributes: None

B12. References: see Continuation Sheet

B13. Remarks: None

B14. Evaluation: Stacey C. Jordan
Date of Evaluation: 7/15/03

(This space reserved for official comments.)



Resource Name or #: El Camino Real between San Dieguito Road and Via de la Valle

Recorded by: Stacey C. Jordan **Date:** 7/15/03

■Continuation □Update

B6. Construction History: This section of El Camino Real traces part of the original path of Don Gaspár de Portolá's 1769 expedition up the California coast to Monterey to identify locations for future Spanish missions and presidios (Carrico 1977). Likely part of a network of Kumeyaay trails, Portolá's route was used in subsequent years by Franciscan Padre Junipero Serra as he spearheaded the establishment of presidios, missions, and pueblos from San Diego to Sonoma. This portion of El Camino Real was used as a route for the battling troops of the Mexican-American war, including Kearney's In 1846 and the late-arriving Mormon Battalion of 1847 (San Diego County Surveyor n.d., Riesenberg 1962:83-105). After 1846 the well-worn El Camino Real served as the main north-south stage route, and this section of El Camino Real carried stage routes until 1851, as well as the Butterfield Connection coaches in 1858 (San Diego County Assessor 1955). At the same time, though, banditry and vigilantism grew along the route, which was no longer seen as a continuous road (Riesenberg 1962:125). By 1898, this section of El Camino Real was set in its present orientation and length, and was a county road.

Spurred by burgeoning ideas for a road linking the missions, the plan for creation of El Camino Real was first made public in a presentation before the Sixth Biennial of the General Federation of Women's Clubs in Los Angeles in 1902. In response to the interest of various and sometimes competing groups, the Los Angeles Chamber of Commerce called for a convention to discuss the plan. At the convention in Santa Barbara in 1904, responsibility for reconstruction of this early route through California was given to the newly formed body, The Camino Real Association of California. Research of church records, rancho diseños, and settler oral histories helped to clarify the route to be developed (Forbes 1915:264-271). El Camino Real remained primarily a dirt road up to 1909, when the establishment of the California Highway Commission led to improvements along the route (Corle 1949:320-322). A decade later, El Camino Real was still plagued by sand drifts and now broken pavement along much of the early attempts at road improvement (Riesenberg 1962:211, 216). The 1920s saw a boom in road-building as well as repairs to the two-lane coast road which by then encompassed much of the historic trail throughout the state and which in 1925 was officially designated U.S. Highway 101. U.S. 101, however, ran west of the portion of the historic El Camino Real between Via de la Valle and San Dieguito Road.

El Camino Real today still refers to much of the length of US Highway 101 and is a registered California Historical Landmark (No. 784). In 1963, the California State Parks Commission marked the southern tip of the route with a plaque reading "placed on the 250th anniversary of the birth of California's apostle Padre Junípero Serra, O.F.M. to mark the southern terminus of El Camino Real as Padre Serra knew it and helped to blaze it." California Assembly Bill 1707, Chapter 739 (10/12/2001) codified the definition of the route, declaring "State highway routes embracing portions of I-280, Route 82, Route 238, US 101, I-5, Route 72, Route 12, Route 37, Route 121, Route 87, Route 162, Route 185, Route 92, and Route 123 and connecting city streets and county roads thereto, and extending in a continuous route from Sonoma southerly to the international border and near the route historically known as El Camino Real shall be known and designated as 'El Camino Real.'" Today, the .54-mile section of El Camino Real within the project area consists of an eponymous medium-duty, paved two-lane city road over the San Dieguito River; the road is currently elevated on trapezoidal fill to a height of 17 feet. In 1986, the southern end of the segment was re-aligned from a perpendicular intersection with San Dieguito Road to a short curve trending southwest.

B12. References:

Carrico, Richard L. 1977. "Portolás 1769 Expedition and Coastal Native Villages of San Diego County" Journal of California Anthropology 4:1.
Corle, Edwin. 1949. The Royal Highway (El Camino Real). New York: Bobbs-Merrill Company, Inc.
Forbes, A.S.C. 1915. California Missions and Landmarks: El Camino Real. Los Angeles, CA.
Riesenberg, Felix, Jr. 1962. The Golden Road: The Story of California's Spanish Mission Trail. New York: McGraw-Hill Book Company, Inc.
San Diego County Surveyor. n.d. Map Showing Roads and Trails of the Pioneers to San Diego, 1769-1865.
San Diego County Assessor. 1955. San Diego County, CA. Map Showing Roads and Trails in use from 1769-1885.

Primary #: ______________________
HRI #: ______________________
Trinomial: ______________________

Resource Name or #: El Camino Real between San Dieguito Road and Via de la Valle

L1. **Historic and/or Common Name:** El Camino Real

L2a. **Portion Described:** ☐ Entire Resoruce ■Segment ☐Point Observation
Designation: El Camino Real between San Dieguito Road and Via de la Valle
b. Location of point or segment .54-mile City of San Diego-owned two-lane road located between San Dieguito Road and Via de la Valle, east of Interstate 5 in San Dieguito Valley. Located in T 14S ; R 3W; portion of NE ¼ of SW ¼ of Sec 6, SE ¼ of SW ¼ of Sec 6 & NE ¼ of NW ¼ of Sec 7; S.B.B.M.; UTM 11 478571E 3648324N (southern end) and UTM 11 478555E 3649157N (northern end)

L3. **Description:** This section of El Camino Real consists of a medium-duty, asphalt-paved, two-lane city road currently elevated on a trapezoidal base of fill to a height of 17 feet. No artifacts were observed.

L4. **Dimensions**
a. **Top Width:** approx. 50 feet
b. **Bottom Width:** approx. 70 feet
c. **Height or Depth:** approx. 17 feet
d. **Length of Segment:** approx. 2851feet

L4e. **Sketch of Cross-Section, Facing:** north

L5. **Associated Resources:** None.

L6. **Setting:** The road runs north-south across the bottom of the San Dieguito River Valley. Adjacent to the road are a new golf course development, coastal brackish marsh and southern coastal salt marshland surrounding the San Dieguito River, and a polo field.

L7. **Integrity Considerations:** The original route of El Camino Real has been paved in this area, with the roadbed raised on fill soil. The route, however, retains integrity of location. Integrity of setting, feeling and association have been somewhat diminished due to development of the paved road itself, as well as general the development of the San Dieguito Valley. Though the road follows the original route in this section, design, workmanship and materials of the existing road date to a later period than that which gives the resource significance.

L8. **Description of Photo, Map or Drawing:** See Location Map and Primary Form

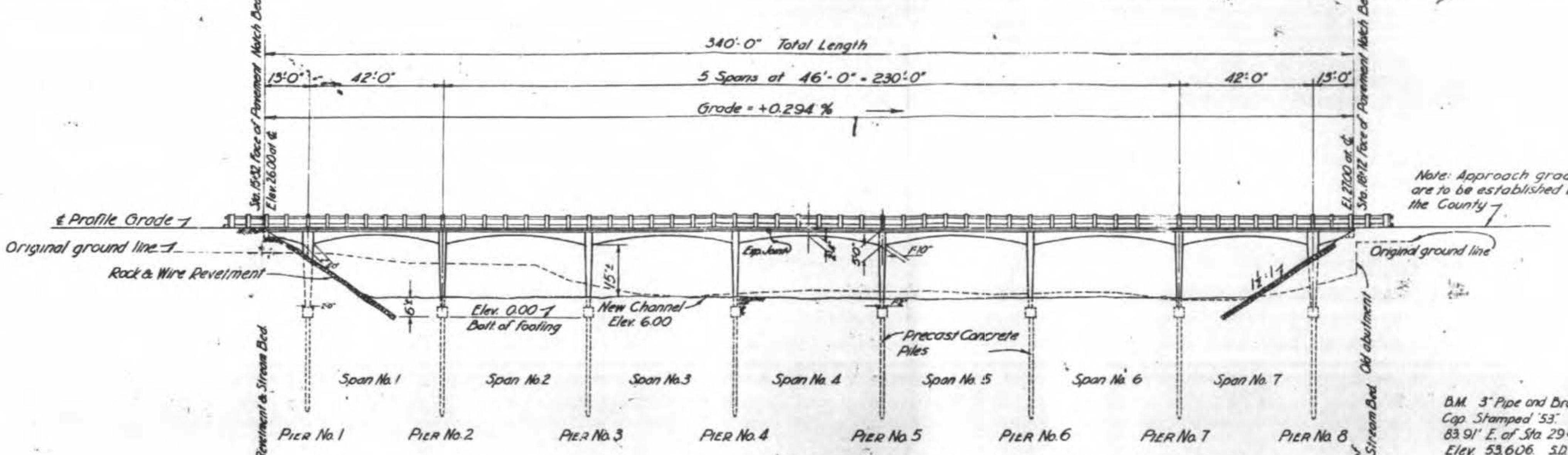
L9. **Remarks:** None

L10. **Form Prepared by:** Stacey C. Jordan, Mooney & Associates,
9903-B Businesspark Avenue, San Diego, CA
92131

L11. **Date:** 7/15/03

APPENDIX C

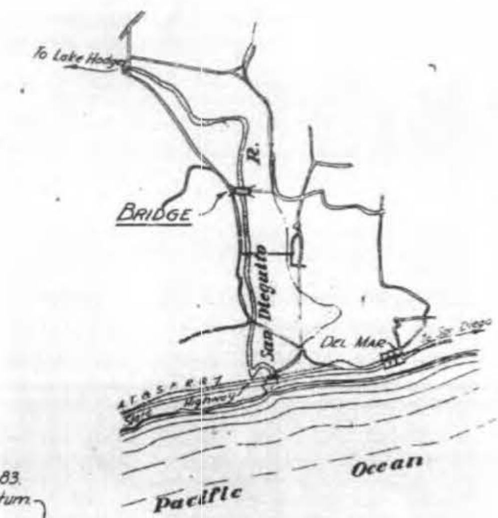
1940 As Built Drawings



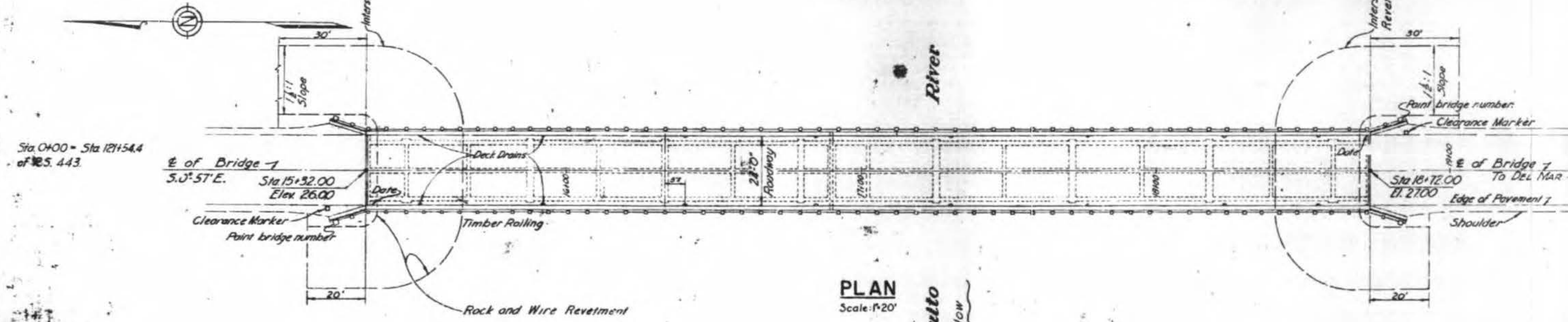
ELEVATION
Scale: 1" = 20'

Note: Existing damaged bridge not shown.

B.M. 3" Pipe and Brass Cap Stamped '53'.
83.91' E. of Sta. 29+76.83.
Elev. 53.606 S.D. Datum.



VICINITY MAP
Scale: 1" = 1 Mile

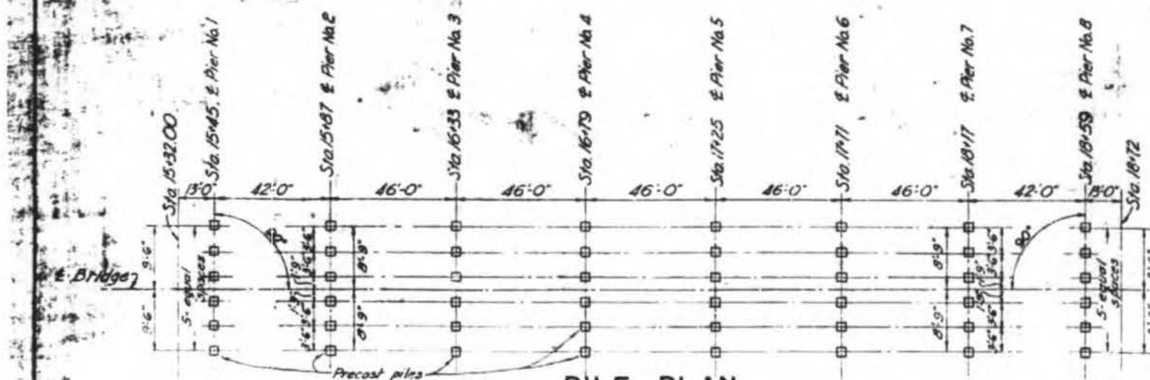


PLAN
Scale: 1" = 20'

INDEX TO PLANS

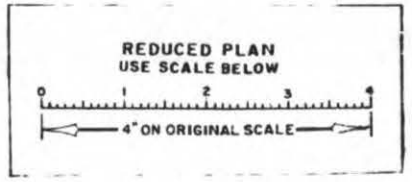
GENERAL NOTES

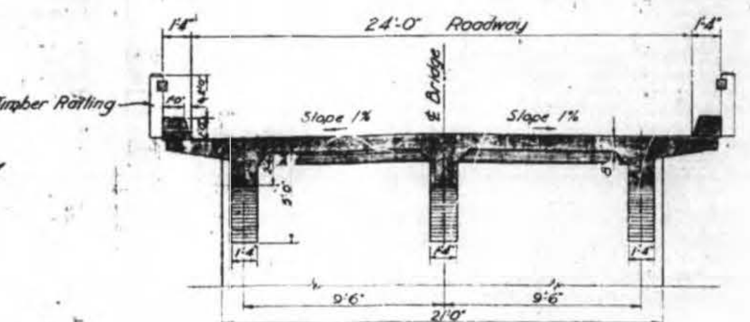
Design Data: American Association of State Highway Officials Specifications, 1935. H-15 Loading.
Allowance for future wearing surface = 15# per sq. ft.
Earthquake: Seismic factor = 10% of dead load.
Working Stresses: fc = 1000# per sq in. fs = 18,000# per sq in. n = 10.
Dead Load + Live Load = 100% working stress.
" " " " + Temp. = 125% working stress.
" " + Earthquake = 133% " "
Load on Piles = 37 tons per pile.
Materials and Workmanship: Shall conform to the above mentioned specifications, the specifications accompanying this set of plans, and the plans. All concrete shall be Class "A" @ 6 sacks of cement per cu. yd. Reinforcing steel shall be structural grade deformed bars, embedded at least 2 bar dia's. and shall be lapped at least 40 bar diameters at splices, unless otherwise shown, and securely tied at all intersections. Bar clearances are measured from center of bar to concrete surface.



PILE PLAN
No Scale.

Note: Reinforced portland cement concrete pre-cast piles 15"×15"-33'-0" shall be used. Min. bearing value = 37 tons per pile.





SECTION
Scale ¼" = 1'-0"

APPROVED:
JOHN W. COLE
ASS'T. ROAD COMMISSIONER
DATE: 5-2-40

SAN DIEGO COUNTY
CALIFORNIA

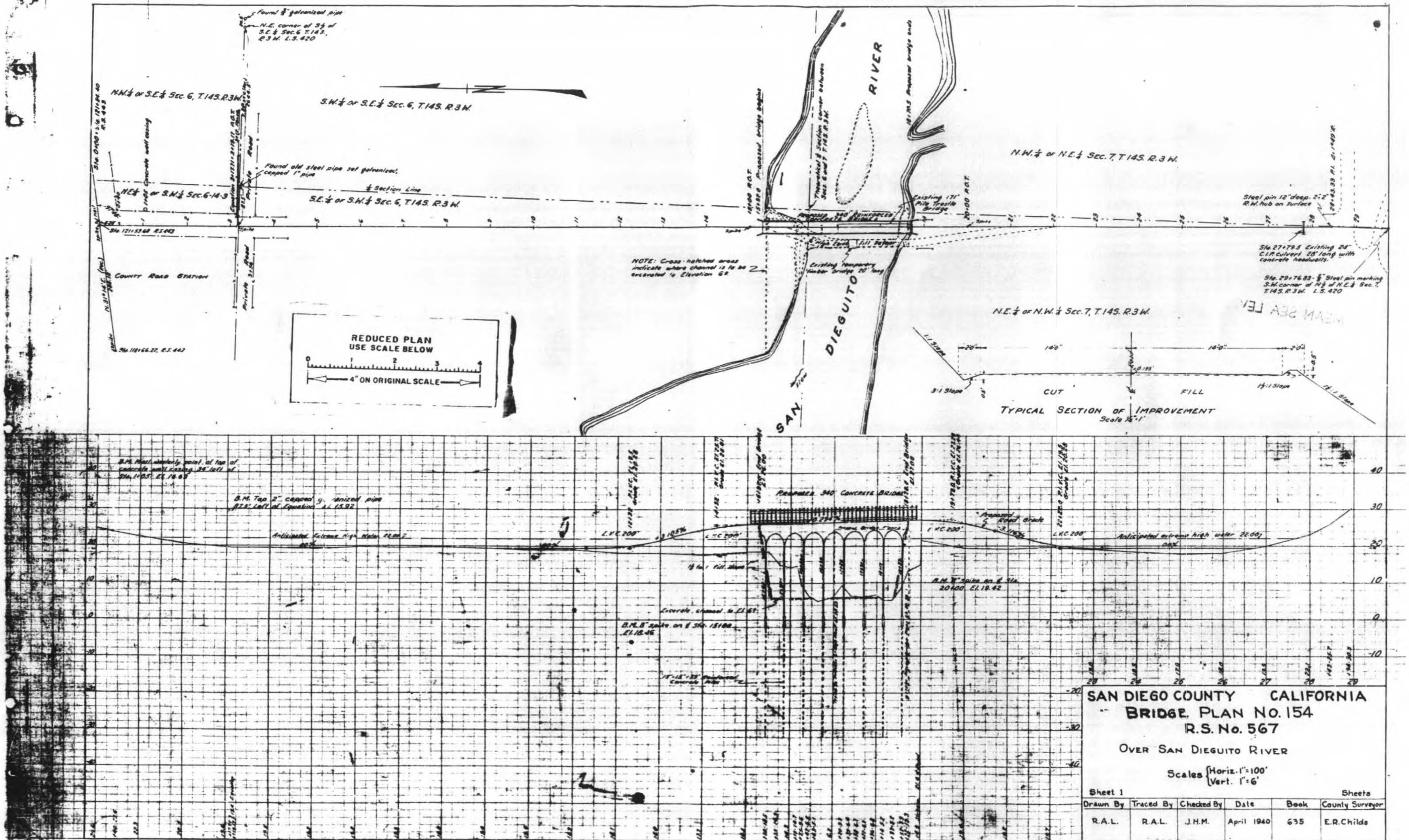
BRIDGE NO. 154
ACROSS SAN DIEGUITO RIVER

GENERAL PLAN

Scale: As noted Date: April 27, 1940.

DONALD R. WARREN 504 ARCHITECTS BUILDING
STRUCTURAL & CIVIL ENGINEER-LOS ANGELES, CALIFORNIA
Donald R. Warren
STRUCTURAL ENGINEER NO. 1166 DRAWING NO. 89-1

Sheet No. 1 of 5 sheets. File 465-7



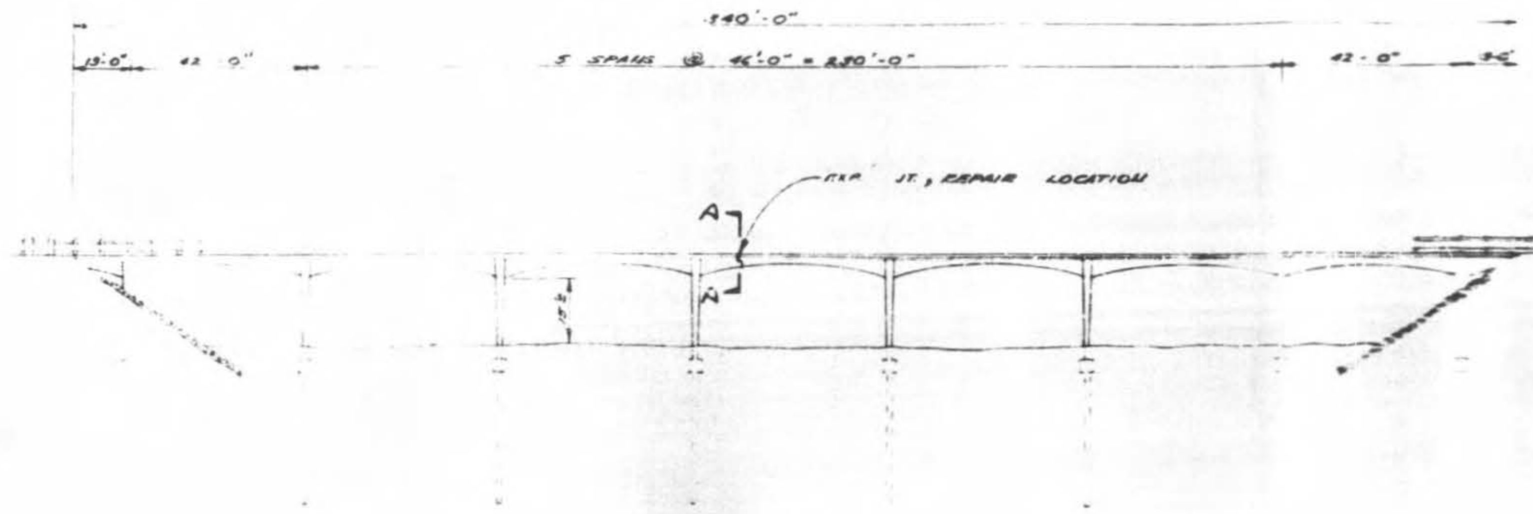
SAN DIEGO COUNTY					CALIFORNIA
BRIDGE PLAN NO. 154					
R.S. No. 567					
OVER SAN DIEGUITO RIVER					
Scales: Horiz. 1"=100', Vert. 1"=6'					
Sheet 1					Sheets
Drawn By	Traced By	Checked By	Date	Book	County Surveyor
R.A.L.	R.A.L.	J.H.M.	April 1940	635	E.R.Childs

14337-1-J

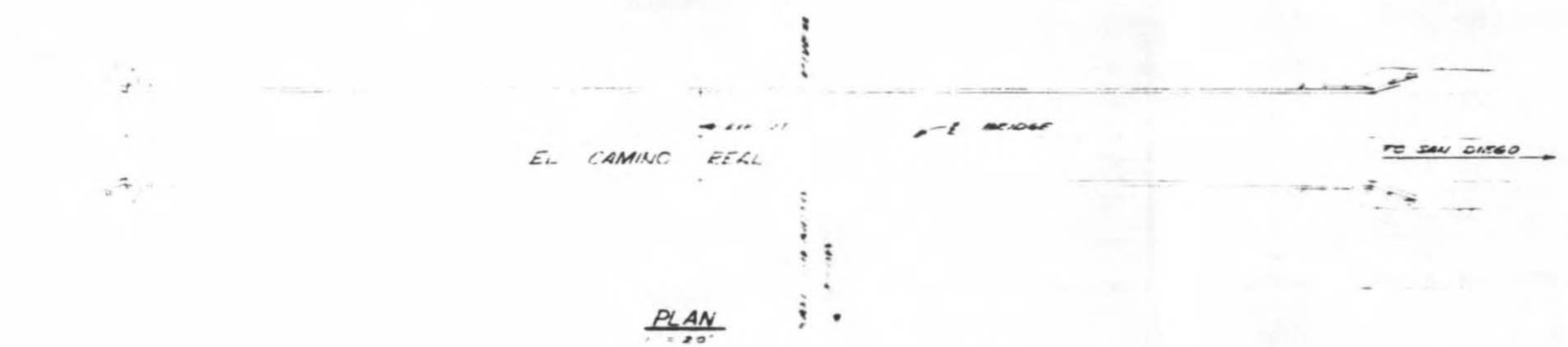
MICROFILMED 455-7

APPENDIX D

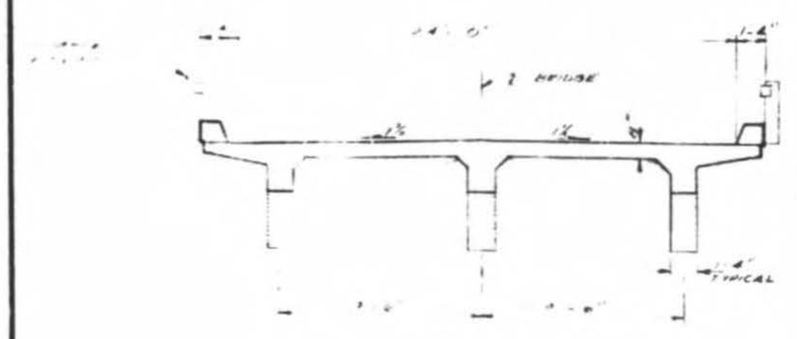
1966 Reconstruction Drawings



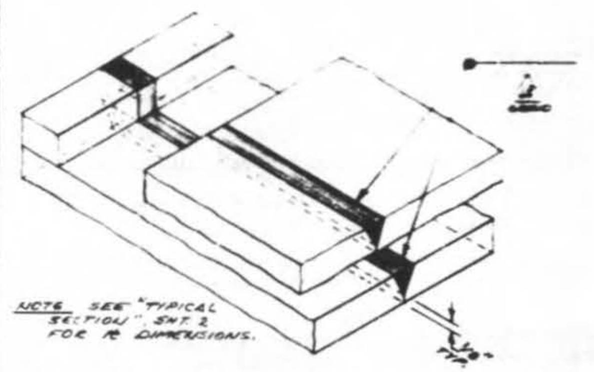
ELEVATION
1" = 20'



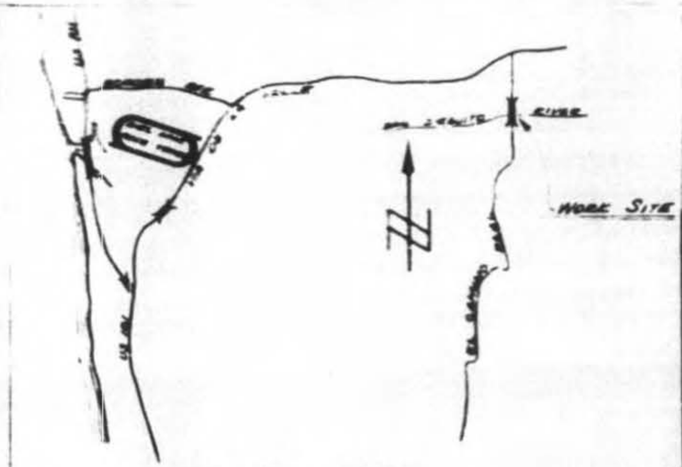
PLAN
1" = 20'



SECTION



EXPANSION DAM WELD AT ℄ BRIDGE
ISOMETRIC



LOCATION MAP
NO SCALE

WORK TO BE DONE

THREE EXISTING ROCKERS SHALL BE REMOVED AND REPLACED WITH THREE NEW EXPANSION PLATE ASSEMBLIES. THE EXISTING PLATE OVER THE JOINT SHALL BE REMOVED AND REPLACED WITH A NEW EXPANSION DAM.

SPECIFICATIONS

STANDARD SPECIFICATIONS OF THE CITY OF SAN DIEGO ...

SPECIAL SPECIFICATION No 1872

REFERENCE DRAWINGS

BRIDGE PLANS ...

TRAFFIC REQUIREMENTS

1. MAINTAIN TWO WAY TRAFFIC IN ONE LANE WITH FLAGMAN CONTROL BETWEEN 8:00 A.M. AND 4:00 P.M. MONDAY THRU FRIDAY
2. MAINTAIN ONE TRAFFIC LANE EACH WAY AT ALL OTHER TIMES

CITY CONTRACT

RECONSTRUCT BEARINGS AT EL CAMINO REAL
BRIDGE OVER SAN DIEGUITO RIVER

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 1 OF 2 SHEETS

W.O. NO. 21802

PLAN REVISION

AS BUILT

4-15-66
4-29-66

W.C. TABARA

12144-1-D

AS BUILT

FIRKINS

April 25, 2012

Ms. Monica Kling
RBF Consulting-San Diego
9755 Clairemont Mesa Boulevard Suite 100
San Diego, California 92124-1324

RE: El Camino Real Road and Bridge Widening Cultural Resources Research

Dear Ms. Kling,

Tierra Environmental Services, Inc. (Tierra) has conducted a records search for the for the El Camino Real Road and Bridge Widening project located within the San Diego Valley watershed in west central San Diego County. The project area is located along the north-south trending San Dieguito Road between Via de la Valle (County Highway S6) and El Camino Real Road. The project area is located within portions of Sections 6 and 7 of Township 14 South, Range 3 West of the Del Mar, California USGS 7.5'-series quadrangle (See Figures 1 and 2). The purpose of this report is to provide a brief summary of the previously recorded cultural resources and address potential concerns for affecting significant cultural resources within the proposed project footprint.

Tierra conducted the records and literature search at the South Coastal Information Center (SCIC) on April 18, 2012. The study area encompassed the project footprint plus a one mile search radius. The records search indicated that within the one mile buffer, 110 cultural resources investigations are on file at the SCIC (Table 1). Furthermore, the proposed project area has been either partially or completely surveyed between 1929 and 2010. The records search also indentified a total of 54 resources within the one mile search area which included six resources crossing into the proposed project footprint (Table 2).

Forty-eight of the 54 resources documented were prehistoric, with four historic and two sites with a combined prehistoric and historic assemblage. The prehistoric resources included 27 temporary camps, eight shell midden or shell scatters, six lithic and shell scatters, five lithic scatters, and two hearth feature sites. The four historic resources included three sites with foundations and associated refuse and one isolated refuse deposit. Both of the combined prehistoric and historic assemblage sites consisted of a prehistoric temporary camp with historic refuse. Of the six sites identified within the project footprint, three were identified on the south side of the San Dieguito River and three on the north. See below for a brief description on each of these resources.

South Side of San Dieguito River
CA-SDI-686
This resource was originally recorded by Claude Warren in 1960 south of the modern day intersection of El Camino Real and San Dieguito Rd (Warren 1960). In 1984, personnel from RBR & Associates, Inc. (RBR) revisited the site and updated the record describing a surface scatter with four discreet loci exhibiting debitage, lithic tools, a mano, and marine shell. The loci were further characterized as representing a series of temporary camps with some midden soil visible. Two years later, RBR returned to the site to conduct archaeological testing within the proposed grading footprint for the realignment of El Camino Real. The testing included 1 m by 1 m test units and additional shovel test pits which yielded artifacts to a depth of more than 50 cm. The subsurface deposit included debitage, a bifacial tool fragment, utilized scrapers, a bone artifact, and historic artifacts as well. Prehistoric ecofacts also included shell, bone, and charcoal (Wade and Cardenas 1986). The RBR testing extended the boundary to its current dimension of 405 m (NE/SW) by 278 (NW/SE).

In recent years the site was revisited during a San Diego Gas & Electric (SDG&E) maintenance project wherein the archaeological monitor from ASM Affiliates, Inc. (ASM) identified scattered marine shell within the SDG&E right of way (Potter 2009). In 2010, AECOM personnel identified two mano fragments and a hammerstone during a survey for a proposed Utility line project across the site (Renna 2010).

It is unknown if an intact subsurface cultural deposits exist within the project footprint. During the recording and subsequent testing of the resource in the mid-1980s, the site boundary was defined as extending to the adjacent modern roadbeds. However, with the tested depth in excess of 50cm and years of down slope erosional processes, it is possible that the additional artifacts may be identified on the northwestern side of El Camino Real during any ground disturbing activities.

CA-SDI-8225/H
Site CA-SDI-8225/H was originally recorded by ASM in 1980 east of the of the modern day intersection of El Camino Real and San Dieguito Rd. (Dittmar 1980). ASM personnel noted more than 10 manos and mano fragments, 2 metate fragments, and a sparse assemblage of lithic material at the site adjacent to the wooden corrals comprising a horse ranch. In 1983, personnel from Mooney-Lettieri & Associates (Mooney-Lettieri) conducted a National Register of Historic Places assessment of the site. The testing included 1 m by 1 m test units and a surface inventory that identified a diverse historic and prehistoric site assemblage including hearth features and an unsubstantiated claim of potential cremated human remains. The broad assortment of artifactual material includes pottery, groundstone, scrapers, hammerstones, and a projectile point fragment. Ecofacts documented at the site included marine shell and bone fragments (Cardenas 1983). The Mooney-Lettieri investigation extended the boundary to 213 m (N/S) by 244 (E/W).

It is unknown if an intact subsurface cultural deposit exists within the project footprint. During the recording and subsequent testing of the resource in the early 1980s, the site boundary was defined as extending north of the current San Dieguito Roadbed just within the boundary of the current project footprint. However, given the high degree of sensitivity attributed to sites possessing cremated remains, construction within the southeastern portion of the project area should be undertaken with a heightened awareness for this resource.

CA-SDI-10117
This site was originally recorded and tested by personnel from RBR in 1984 (Wade and Cardenas 1984). The crew from RBR identified the site as a temporary camp with a moderate density of marine shell and artifacts and midden soils. The testing included shovel test pits which yielded artifacts to a depth of at least 30 cm and included fire-affected rock, a core, debitage, and pottery. The RBR testing identified the site boundary as 73 m (N/S) by 110 m (E/W). The site record also inidcated a disturbed shell scatter existed north of the site on the opposite side of San Dieguito Rd.

In 1993, a crew from Gallegos & Associates (Gallegos) attempted to relocate the site, but only located four unidentifiable fragments of marine shell in a heavily disturbed portion of the site area. Gallegos personnel concluded that the site was subsequently destroyed by residential and urban development of the area.

It is unknown if an intact subsurface cultural deposit exist within the project footprint. During the initial recording and testing of the resource in the mid-1980s, a notably disturbed area with marine shell was identified to the north of the established boundary for CA-SDI-10117. Furthermore, site CA-SDI-8225/H is less than 100 meters to the northeast and may have contributed to a much larger site that was subsequently bisected by roads and area development. Therefore, it is possible that any work performed in the vicinity of San Dieguito Rd. could turn up portions of one or both of these two sites.

North Side of San Dieguito River
CA-SDI-16695
This site was originally recorded by Malcolm Rogers as W-45-A in 1929 based on information received from a road crew conducting work in 1917. The crew reported several cinerary urns or ollas containing calcined bone and beads (Rogers 1929). When Rogers finally learned of the site and began recording it, he reported that the site was disturbed by roads, cultivation, and construction, but still felt that the site warranted additional excavation. The site was not formally revisited until 1998 when a survey crew from Tierra attempted to relocate the site, but only identified a small disturbed portion of a midden containing marine shell in the general vicinity of the site (Bark 1998). In 2006, a crew from LSA Associates, Inc. (LSA) returned to the area and located the disturbed midden deposit and also identified several flakes, mano fragments and lithic tools. LSA also concluded that the site was “extremely disturbed” and therefore could not determine if the assemblage was within primary context (Fulton 2006). The LSA site record documented the site as measuring 200 m (N/S) by 180 m (E/W).

It is unknown if an intact subsurface cultural deposits exist within the project footprint. Based on the repeated description s of disturbances between 1929 and 2006, it would appear to be highly unlikely that such a deposit would still be present today. However, given the high degree of sensitivity attributed to sites possessing cremated remains, construction along the northwestern portion of the project area should be undertaken with a heightened awareness of these concerns.

CA-SDI-16696
While site CA-SDI-16696 has been identified with a separate trinomial, it is located immediately east of CA-SDI-16695 and is likely just an extension of that site. In fact, the original site record still utilizes the same base record for W-45 recorded by Malcolm Rogers in 1929 (see site discussion above). In 1998 a survey crew from Tierra identified this portion of the site describing a light scatter of marine shell in a disturbed context. Tierra documented the site as measuring 7 m (N/S) by 7 m (E/W) (Bark 1998),

although historically, the area of the site was estimated at a half acre according to the 1929 site record (Rogers 1929).

It is unknown if an intact subsurface cultural deposits exist within the project footprint. Based on the repeated descriptions of disturbances between 1929 and 1989, it would appear to be highly unlikely that such a deposit would still be present today. However, given the high degree of sensitivity attributed to sites possessing cremated remains, construction along the northwestern portion of the project area should be undertaken with a heightened awareness of these concerns.

CA-SDI-18608
The site was originally recorded as W-611 by Mark Ryzdynski in 1975. Ryzdynski observed that the feature consisted of an oval-shaped hearth feature with no additional associated artifacts or features. According to the site record, the feature measured 1.4 m by 1.7 m and was likely disturbed by a residential development project. To date, the feature has not been relocated according to the information on file at SCIC.

It is unknown if an intact portion of this feature or an associated assemblage not previously documented exists within the project footprint today. However, since the site was only observed to be a surface deposit, and given the extensive disturbance in this vicinity, it remains unlikely the resource exists at present.

Summary
According to the information obtained from the SCIC, the entire project area has been subjected to various forms of archaeological survey between 1929 to the present day. Furthermore, these surveys have provided a significant quantity of archaeological site data associated with both historic and prehistoric utilization of the San Dieguito River channel for an extended amount of time. Also given the inherent depositional nature of the environment and the documented testing within the project footprint identifying deposit in excess of 50 cm, ground disturbing activities may identify additional site features and deposits not previously recorded. Furthermore, with the possibility of cremated remains existing on both sides of the riverbed, the potential sensitivity for encountering human remains is regarded as moderately high diminished only by the extensive disturbance in the area.

If you require further information or have questions, please contact Christopher Shaver or Michael Baksh at Tierra at (858) 578-9064.

Thank you,

Chris Shaver
Project Archaeologist

Enclosures:

- Tables 1-2

Table 1. Archaeological Investigations Within A One-Mile Radius of the Project Area

Author	Project	Date
American Pacific Environmental Consultants, Inc.	Environmental Impact Report For San Dieguito River Study Draft Conceptual Master Plan. American Pacific Environmental Consultants, Inc. Submitted to City Of San Diego.	1981
American Pacific Environmental Consultants, Inc.	Archaeological Reconnaissance Of The Fairbanks Country Club. American Pacific Environmental Consultants, Inc. Submitted to Watt Industries Of San Diego.	1981
Baksh, Michael and Patrick McGinnis	Historic Property Survey Report For The El Camino Real Road/Bridge Widening/Replacement Project, San Diego County, El Camino Real Bridge 57C0042. Tierra Environmental Services. Submitted to City Of San Diego.	2006
Berryman, Judy and Craig Woodman	Draft Archaeological Investigations For The San Dieguito Wetlands Restoration Project EIR/EIS. Science Application International Corporation. Submitted to San Dieguito River Valley Regional. Open Space Park Joint Power	1999
Berryman, Judy and Jo Anne Gilmer	Cultural Resource Survey For The Villa Costa Vista Property City Of San Diego. RECON. Submitted to Cooper Engineering Associates.	2000
Berryman, Judy and Craig Woodman	Archaeological Investigations For The San Dieguito Wetland Restoration Project EIR/EIS. Science Application International Corporation. Submitted to San Dieguito River Valley Regional Open Space Park.	2000
Berryman, Stanley	Results Of Archaeological Test At Sun Valley Bluffs, Rancho Santa Fe, California. Toups Corporation. Submitted to Sun Valley Bluffs.	1977
Bissell, Ronald	A Cultural Resource Reconnaissance Of Property Located At 1688 Lugano Land, San Diego County, California. RMW Paleo & Associates.	1999
Bonner, Wayne and Arabesque Said	Cultural Resources Records Search And Site Visit Results For Clearwire Candidate Casdg5517a/ Sd03xc177b (Polo Fields), 3675 Via De La Valle, Del Mar, San Diego County, California. Michael Brandman Associates. Submitted to Depratti Incorporated.	2009
Bonner, Wayne and Arabesque Said	Cultural Resource Records Search And Site Visit Results For Verizon Wireless Candidate Teepee, Torrey Highlands Park, Lansdale Drive, San Diego, San Diego County, California. Michael Brandman Associates. Submitted to EBI Consulting.	2009
Bowden-Renna, Cheryl	Cultural Resources Survey For Gas Regulator Station, Del Mar Area of San Diego County, California. AECOM. Submitted to SDG&E.	2010
Bowden-Renna, Cheryl	Cultural Resources Survey For 57 Wood to Steel Pole Undergrounding And Pole Replacements Along Tl667 and Tl610 And Staging Yard Areas Along Via De La Valle and El Camino Real, Del Mar Area Of San Diego County, California. AECOM. Submitted to SDG&E.	2010
Bull, Charles	An Archaeological Survey Of The Seawind-Del Mar Property. RECON. Submitted to Don E. Woodward.	1977
Bull, Charles	An Archaeological Survey Of San Dieguito Estates. RECON. Submitted to Pardee Construction.	1978
Bull, Charles and Jay Hatley	An Archaeological Survey Of The Highland Estates Project Area. RECON. Submitted to Lomas Santa Fe, Inc.	1977
Byrd, Brian and Collin O'Neill	Archaeological Survey Report For The Phase I Archaeological Survey Along Interstate 5 San Diego County, California. ASM Affiliates, Inc. Submitted to Caltrans.	2002
Caltrans	Negative Archaeological Survey Report 11-Sd-5 P.M. R 35.2. Caltrans.	1995

Table 1. Archaeological Investigations Within A One-Mile Radius of the Project Area

Author	Project	Date
Cardenas, Sean	Cultural Resource Assessment: El Camino Real Realignment Right-Of-Way EQD N.84-0636. RBR & Associates, Inc. Submitted to Pardee Construction Company.	1986
Cardenas, Sean and Cathy Winterrowd	An Archaeological Investigation Of SDM-W-26A: A Site Near Del Mar, California. RBR & Associates. Submitted to Pardee Construction Company.	1986
Carrico, Richard	Archaeological Investigations Of The Dalfio Property, San Diego, California. Westec Services, Inc. Submitted to Mr. Vito Dalfio.	1977
Caterino, David	The Cemeteries And Gravestones Of San Diego County: An Archaeological Study. David Caterino. Thesis on file at San Diego State University, Department Of Anthropology.	2005
Chace, Paul	An Archaeological Constraint Study Of The T.C. Hu Property, The North County Riding Center, On Via de la Valle, City Of San Diego. The Keith Companies: Paul Chace. Submitted to T.C. Hu.	1996
City of San Diego	Public Notice Of Draft Environmental Impact Report for the Rhodes Vesting Tentative Map. City Of San Diego.	1993
City of San Diego	Proposed Negative Declaration: Bame. Gallegos & Associates. Submitted to Lawrence Bame and The City Of San Diego.	1995
City of San Diego	Draft EIR for the Del Mar Highlands Estates. City Of San Diego.	1996
City of San Diego	Draft EIR Ranch At Stallions Crossing. City Of San Diego. Submitted to San Dieguito Partnership.	1996
City of San Diego	Draft EIR Pacific Highlands Ranch (Subarea 3) Subarea Plan In The North City Future Urbanizing Area. City Of San Diego.	1998
City of San Diego	Environmental Impact Report, Rancho Santa Fe Golf Range and Park. City Of San Diego.	1999
City of San Diego	Public Notice Of A Proposed Mitigated Negative Declaration Nobel Research Park. City Of San Diego. Submitted to San Dieguito Partnership, Ltd.	1999
Cook, John	Archaeological Reconnaissance Of The Fairbanks Country Club, San Diego County. American Pacific Environmental Consultants, Inc. Submitted to Watt Industries.	1981
Cook, John	Appendix C Archaeological Reconnaissance Of The Fairbanks Country Club, San Diego County. American Pacific Environmental Consultants, Inc. Submitted to Watt Industries.	1981
Leach, Dr. Larry	Cultural Resource Survey Report: Proposed Access to Del Mar Fairground Parking Area On The West Side Of I-5. CRM Center, San Diego State University. Submitted to California Department Of General Services.	1985
Cupples, Sue Ann	A Report On An Archaeological Survey Of San Andres Housing Development. Dr. Paul H. Ezell. Submitted to Rick Engineering Company.	1974
Dominici, Deborah	Historic Property Survey Report, I-5 North Coast Widening Project. Caltrans.	2007
Dominici, Deborah	Historic Property Survey Report For The Interstate 5 North Coast Corridor Project. Caltrans.	2010
Eighmey, James	The Stallions Crossing Project: Cultural Resource Significance Testing At SDI-7290, SDI-7293, SDI-7298, SDI-7300, SDI-10118, SDI-10535. RECON. Submitted to San Dieguito Valley Inc.	1990

Table 1. Archaeological Investigations Within A One-Mile Radius of the Project Area

Author	Project	Date
Eighmey, James	The Village And The Ranch At Stallions Crossing: Cultures Resources Survey And Testing At SDI-5957, SDI-7287, SDI-7290, SDI-7291, SDI-7293, SDI-7298, SDI-7300, SDI-10118, and SDI-10535. RECON. Submitted to San Dieguito Valley, Inc.	1993
Eighmey, James and Dayle Cheever	The Villas At Stallion Crossing Cultural Resource Testing At SDI-687 Archaic Occupations Within The San Dieguito Valley (Dep No. 93-0441). RECON. Submitted to San Dieguito Partnership.	1996
Englehorn, Curtis Scott	Draft Program Environmental Impact Report Santa Fe Irrigation District Water Master Plan. Curtis Scott Englehorn And Associates. Submitted to Santa Fe Irrigation District.	2002
Fink, Gary	Archaeological Survey For The Proposed Whispering Palms Interceptor Sewer, Rancho Santa Fe, California. San Diego County Engineer Department. Submitted to Department Of Sanitation And Flood Control.	1975
Flower, Douglas and Janet Eidsness et al.	Archaeological Investigation Of The Sorrento Valley Road Pipeline Project Limited Linear Test, City Of San Diego, California SDI-4513. Flower, Ike & Roth Archaeological Consultants. Submitted to Mike Masanovich Construction Co., Inc.	1979
Fulton, Phil	Cultural Resources Assessment Del Mar Fairgrounds Project Cities Of Del Mar And San Diego, San Diego County, California. Lsa Associates, Inc.. Submitted to 22nd District Agricultural Association.	2006
Gallegos, Dennis and Roxanna Phillips et al.	A Cultural Resource Overview For The San Dieguito River Valley San Diego, California. WESTEC Services, Inc. Submitted to City Of San Diego.	1988
Gallegos, Dennis and Ivan Strudwick et al.	Historic/Archaeological Survey And Test Report For Subarea 111 Future Urbanizing Area, San Diego, California. Gallegos And Associates. Submitted to Helix Environmental Planning Inc.	1993
Gallegos, Dennis and Ivan Strudwick et al.	Historical/Archaeological Survey Report For Del Mar Highlands Estates, San Diego, California. Gallegos & Associates. Submitted to Helix Environmental Planning, Inc.	1995
Gallegos, Dennis and Roxanna Phillips et al.	Final: Archaeological Testing Of Site Ca-SDI-13094/H For Del Mar Highlands Estates, San Diego, California. Gallegos & Associates. Submitted to Helix Environmental Planning.	1995
Gardner, Jill	Archaeological Monitoring For The SDG&E Encina-Penasquitos 230Kv Transmission Line Project From Carlsbad to Carmel Valley, And Guard Structure Pole Field Checks For The SDG&E Encina-Penasquitos Reconductor Project. ASM Affiliates, Inc. Submitted to San Diego Gas & Electric.	2009
Gardner, Jill and Elizabeth Potter	Cultural Resources Survey For The San Diego Polo Club Project, Del Mar, California. ASM Affiliates, Inc. Submitted to KLR Planning.	2009
Guerrero, Monica and Dennis Gallegos	Cultural Resource Survey For The Via De La Valle Project San Diego, California. Gallegos & Associates. Submitted to Shapouri & Associates.	2003
Hanna, David	Appendix E: Archaeological Testing Of Six Sites At The Proposed North City West Seventh Development. David C.Hanna, Consultant. Submitted to RBR & Associates.	1983

Table 1. Archaeological Investigations Within A One-Mile Radius of the Project Area

Author	Project	Date
Hector, Susan	Archaeological And Biological Survey Reports For The San Andres Project, County Of San Diego, Ca. RECON. Submitted to Lomas Santa Fe Development Corporation.	1981
Hector, Susan	Archaeological Investigations On The Calle Cristobal Assessment District and Genstar Assessment District Parcel 16, City Of San Diego. RECON. Submitted to Vtn San Diego.	1987
Hector, Susan	Cultural Resources Report For San Dieguito Park. Susan Hector. Submitted to Parks & Rec Sept..	1990
Hector, Susan and Alice Brewster	San Dieguito River Valley Inventory Of Archaeological Resources. ASM Affiliates, Inc. Affiliates. Submitted to City Of San Diego Planning Department.	2002
Hector, Susan and Drew Pallette et al.	Archaeological Evaluation Of The Rancho Valley Farms Project: Maritime Resource Exploitation In The Lower San Dieguito River Valley. ASM Affiliates, Inc. Affiliates. Submitted to Pardee Homes.	2005
Hector, Susan	Encina-Penasquitos Transmission Line Records Search. ASM Affiliates, Inc.	2007
A.D. Hinsahw Associates	Draft Environmental Impact Report Rancho Del Rayo Estates (Tm 4413) Log#83-13-20. A.D. Hinshaw Associates. Submitted to Eugene V. Klein.	1984
Hix, Ann	Draft Environmental Impact Report Del Mar Highlands Estates. Ann Hix. Submitted to City Of San Diego.	1994
Kaldenberg, Russell	An Archaeological Survey Report On "The Point". RECON. Submitted to Pardee Construction Company.	1975
Kick, Maureen	Cultural Resources Technical Report For The San Diego Vegetation Management Project. URS. Submitted to FEMA.	2007
Kyle, Carolyn and Larry Tift et al.	Historical/Archaeological Survey And Test Report For The Rancho Santa Fe Golf Practice Range And Park Project, City Of San Diego, California. Gallegos & Associates. Submitted to David Lee Soanes Limited Architecture & Planning.	1995
Lauko, Kimberly and Christeen Taniguchi	Cultural Resources Records Search and Site Visits Results For Sprint Telecommunications Facility Candidate Sd54XC432A (Ladera Sarina) 4932 Sun Valley Road, Rancho Santa Fe, California. Michael Brandman Associates. Submitted to Sprint.	2004
Laylander, Don and Linda Akyuz	Archaeological Survey For The Caltrans I-5 North Coast Corridor Project Biological Mitigation Parcels, San Diego County, California. ASM Affiliates, Inc. Submitted to Environmental Resource Studies Branch Chief.	2008
Mason, Roger and Jeanette McKenna	Indexing Program At Ca-SDI-5372/H Del Mar Highlands Estates Project, City Of San Diego, California. Chambers Group, Inc. Submitted to Pardee Construction.	1998
Mattingly, Scott	Archaeological And Geospatial Investigations Of Fire-Altered Rock Features At Torrey Pines State Reserve, San Diego, California. AECOM.	2007
McGinnis, Patrick and Michael Baksh	Cultural Resource Inventory For The El Camino Real Road/ Bridge Widening, Project Permit No. L2928, Log No. 97-14-1. Tierra Environmental Services.	2003
McGinnis, Patrick	Cultural Resource Inventory For The El Camino Real Road/Bridge Widening Project, Permit No. L2928, Log No. 97-14-1 (Update). Tierra Environmental. Submitted to Earth Tech.	2004

Table 1. Archaeological Investigations Within A One-Mile Radius of the Project Area

Author	Project	Date
McKenna, Jeanette	Archaeological Investigations Of Ca-SDI-5372/H, A Historic Archaeological Site Located In The Del Mar Area Of San Diego County, California. McKenna et al. Submitted to Chambers Group, Inc.	1995
Mooney-Lettieri and Associates, Inc.	National Register Assessment Of SDI-8225. Mooney-Lettieri And Associates, Inc. Submitted to Watt Industries Of San Diego.	1983
Mooney-Lettieri and Associates, Inc.	National Register Assessment Of SDI-8225. Mooney-Lettieri And Associates. Submitted to Watt Industries.	1985
Mock, Kevin and Mike Kelly et al.	Archaeological Survey Report Cavallo Farms Improvement Project City Of San Diego, San Diego County, California. URS. Submitted to Cavallo Farms.	2008
Monserrate, Lawrence	EIR: Pacific Highlands Ranch Subarea Plan In The North City Future Urbanizing Area. Lawrence Monserrate. Submitted to City Of San Diego.	1998
Schaefer, Jerome	Draft Environmental Impact Report For Rancho Highland. Mooney-Lettieri & Associates. Submitted to Rancho Highland Associates.	1985
Nighablain, Sinead	Cultural Resources Survey Report For The Brandes Property. Gallegos & Associates. Submitted to Brandes Family.	2000
Nighablain, Sinead and Drew Pallette	A Cultural Resources Inventory For The Route Realignment Of The Proposed Pf. Net / AT&T Fiber Optics Conduit Oceanside to San Diego, California. ASM Affiliates, Inc. Submitted to Foster Wheeler Environmental Corporation.	2001
Norwood, Richard and Carol Walker	The Cultural Resources Of San Dieguito Estates. RECON. Submitted to Pardee Construction Company.	1980
Peter, Kevin and Nancy Whitney-Desautels	Cultural Resources Investigation Of The Ukegawa Brothers Agricultural Use Permit Project, Sector R, Carmel Valley Region Sector, San Diego, California.. Scientific Resource Surveys, Inc. Submitted to C. Scott Englehorn.	1986
Pierson, Larry	An Archaeological Survey Of The Casa Palmera Project, San Dieguito Valley, California. Brian F. Smith Associates. Submitted to Galvin & Christilli Architects.	1998
Pierson, Larry	Archaeological Survey Of The Casa Palmera Project. Larry Pierson. Submitted to Galvin & Christilli Architects.	1998
Pierson, Larry	An Archaeological Survey Of The Evangelical Fromosa Church Project; 14900 El Camino Real, San Diego, California 92130. Brian E. Smith And Associates. Submitted to Evangelical Formosa Church Of San Diego.	2000
Pierson, Larry	An Archaeological Survey Of The Evangelical Formosa Church Project. Brian F. Smith & Associates. Submitted to Evangelical Formosa Church Of San Diego.	2003
Pigniolo, Andrew and Dustin Kay	Cultural Resources Monitoring Report For A 1.6 Acre Revegetation Project Within The San Dieguito River Valley Regional Park San Diego, California, Tierra Environmental Services. Submitted to City Of San Diego.	2002
Pigniolo, Andrew and Michael Baksh	Cultural Resource Inventory For The El Camino Real Road/Bridge Widening. City Of San Diego Engineering And Capital Project Department. Tierra Environmental Services.	1999

Table 1. Archaeological Investigations Within A One-Mile Radius of the Project Area

Author	Project	Date
Price, Harry and Jackson Underwood	Results Of A Cultural Resources Survey For The River Park Equestrian Center In Del Mar, San Diego, California. RECON. Submitted to River Park Equestrian Center.	2007
RBR & Associates, Inc.	Draft Environmental Impact Report For North City West Seventh Development Unit. RBR& Associates. Submitted to Pardee Construction Company.	1983
RBR & Associates, Inc.	A Cultural Resources Inventory For The El Camino Real Extension Alignment Study, EQD No. 84-0636. RBR & Associates, Inc. Submitted to Pardee Construction Company.	1984
RBR & Associates, Inc.	An Archaeological Investigation Of Sdm-W-26a: A Site Near Del Mar, California. RBR & Associates, Inc. Submitted to Pardee Construction Company.	1986
RECON	Archaeological And Biological Survey Reports For The San Andres Project County Of San Diego. RECON. Submitted to Lomas Santa Fe Development Corporation.	1981
Robbins-Wade, Mary	Archaeological Resources Inventory For The Armstrong/Flower Hill Property, Del Mar, California. Affinis. Submitted to Paul Chelminiak.	1998
Robbins-Wade, Mary	Archaeological Resources Inventory For The Sea Breeze El Camino Real Property, San Diego, California. Affinis. Submitted to Sea Breeze Properties, Inc.	2002
Robbins-Wade, Mary	Archaeological Resources Inventory For The Maron Property At Old El Camino Real, San Diego, California. Affinis. Submitted to Maron Family Del Mar LLC.	2005
Robbins-Wade, Mary	Archaeological Monitoring: Pump Station 79 Force Main, San Diego, California. Affinis. Submitted to Helix Environmental Planning.	2009
Rosen, Martin	Historic Property Survey Report Oceanside to San Diego-Rail to Trail. Martin Rosen.	1999
Rosen, Martin	Historic Property Survey Report Interstate 5 Northbound Auxiliary Lane Project 11-Sd-5 KP R 56.0/R57.5 Pm R334.81/R35.7; Ea. 065100. Caltrans. Submitted to Federal Highway Administration.	2002
Rosen, Martin & Karen Crafts	Negative Archaeological Survey Report, Second Addendum, 11-Sd-5 P.M. R35.2 189161. Caltrans. Submitted to Caltrans.	1995
Rosen, Martin & Karen Crafts	Negative Archaeological Survey Report, Second Addendum, 11-Sd-5 P.M. R35.2 189161. Caltrans. Submitted to Caltrans.	1995
Roth, Linda	Archaeological Survey And Testing Results For The 10.2 Acre Rhodes Project Assessor's Parcel Number 304-010-20/34. North City West Planning District, San Diego, California. Roth & Associates. Submitted to Keith Rhodes.	1992
Ryzdynski, Mark	Sun Valley Bluffs, Lomas Santa Fe, County Of San Diego, Ca. Independent Archaeological Consultants. Submitted to Sun Valley Bluffs Partnership.	1974
Ryzdynski, Mark	Archaeological Investigation Of Rancho De La Valle, Lomas Santa Fe County Of San Diego, California. Independent Archaeological Consultants. Submitted to A.K. Enterprises.	1975

Table 1. Archaeological Investigations Within A One-Mile Radius of the Project Area

Author	Project	Date
Smith, Brian	An Archaeological Study For The Villas At Derby Downs Project: An Archaeological Survey Of A 1.38 Acre Development Project Conducted In Accordance With CEQA And The Guidelines Of The City Of San Diego. Brian F. Smith And Associates. Submitted to Lorimer-Case Architects.	1991
Smith, Brian	Results Of An Archaeological Study For The Torrey Pines Summit Project. Brian F. Smith & Associates. Submitted to JP Engineering.	1991
Smith, Brian	Results Of An Archaeological Data Recovery Program At Sites CA-SDI-4618a, CA-SDI-4619, and CA-SDI-10915. Brian F. Smith & Associates. Submitted to Baldwin Company.	1989
Smith, Brian	Result Of An Archaeological Study For The Torrey Pines Summit Project. Brian F. Smith & Associates. Submitted to JP Engineering.	1991
Smith, Brian	Archaeological Resource Report Form: Archaeological Survey Of The El Camino Real Road Widening Project. Brian F. Smith & Associates. Submitted to Dr Horton.	2008
Stropes, Tracy and Brian Smith	A Cultural Resources Study For The Mckean SDP Project. Brian F. Smith & Associates. Submitted to Mckean Natural Gas.	2009
Strudwick, Ivan and Roxanna Phillips et al	Historical/Archaeological Survey And Test Report For North City Future Urbanizing Area, Subarea 3. Gallegos & Associates. Submitted to Helix Environmental Planning, Inc.	1993
Strudwick, Ivan	Historical/Archaeological Survey: Test Report For North City Future Urbanizing Area Subarea 3, San Diego. Gallegos And Associates. Submitted to City Of San Diego.	1993
Strudwick, Ivan	Letter For Cultural Resource Report For The Bame Property 94-0623. Gallegos & Associates. Submitted to Latitude 33 Planning And Engineering: Randi Coopersmith.	1995
TMI Environmental Services	Cultural Resources Report For The Liew Subdivision. TMI Environmental Services. Submitted to Nasland Engineering.	1988
U.S. Fish & Wildlife Service and San Dieguito River Park Joint Authority	Environmental Impact Report/Environmental Impact Statement (EIR/EIS) For The San Dieguito Wetlands Restoration Project.	2000

Table 2. Cultural Resources Within A One-Mile Radius of the Project Area

Site Designation	Period	Site Type	Date
P-37-029951	Prehistoric	Lithic scatter	1979
P-37-029952	Prehistoric	Lithic scatter	1979
CA-SDI-00194	Prehistoric	Temporary camp	1977
CA-SDI-00293	Prehistoric	Temporary camp	1960
CA-SDI-00322	Prehistoric	Temporary camp	1977
CA-SDI-00685	Prehistoric	Temporary camp	1960
CA-SDI-00686*	Prehistoric	Lithic scatter	1960
CA-SDI-00687	Prehistoric	Village	1960
CA-SDI-05154	Prehistoric	Temporary camp	1975
CA-SDI-05155	Prehistoric	Temporary camp	1975
CA-SDI-05369	Prehistoric	Temporary camp	1977
CA-SDI-05370	Prehistoric	Shell midden	1977
CA-SDI-05371	Prehistoric	Shell midden	1977
CA-SDI-05372	Historic	Historic Foundation/ Refuse scatter	1977
CA-SDI-05373	Prehistoric	Temporary camp	1977
CA-SDI-05612	Prehistoric	Temporary camp	1978
CA-SDI-05957	Prehistoric	Temporary camp	
CA-SDI-06870	Prehistoric	Temporary camp	1979
CA-SDI-06871	Prehistoric	Shell scatter	1979
CA-SDI-07287	Prehistoric	Temporary camp	1979
CA-SDI-07289	Prehistoric	Temporary camp	1979
CA-SDI-07290	Prehistoric	Temporary camp	1980
CA-SDI-07291	Prehistoric	Temporary camp	1981
CA-SDI-07293	Prehistoric	Temporary camp	1979
CA-SDI-07296	Prehistoric	Temporary camp	1979
CA-SDI-07297	Prehistoric	Shell scatter	1979
CA-SDI-07298	Prehistoric	Shell scatter	1979
CA-SDI-07300	Prehistoric	Temporary camp	1979
CA-SDI-07301	Prehistoric	Temporary camp	1979
CA-SDI-07302	Prehistoric	Temporary camp	1979
CA-SDI-08255/H*	Prehistoric / Historic	Temporary camp with historic refuse	1980
CA-SDI-09259	Prehistoric	Lithic and shell scatter	1979
CA-SDI-09260	Prehistoric	Lithic scatter	1979
CA-SDI-09261	Prehistoric	Lithic and shell scatter	1979
CA-SDI-09262	Prehistoric	Lithic and shell scatter	1979
CA-SDI-09263	Prehistoric	Lithic and shell scatter	1979
CA-SDI-09268	Prehistoric	Lithic scatter	1980
CA-SDI-10117*	Prehistoric	Temporary camp	1984
CA-SDI-10118	Prehistoric	Temporary camp	1985
CA-SDI-10535	Historic	Historic structure, foundations, and refuse deposit	1986
CA-SDI-12519	Prehistoric	Hearths and lithic scatter	1988
CA-SDI-13094	Prehistoric	Prehistoric temporary camp and historic refuse deposit	1993

Table 2. Cultural Resources Within A One-Mile Radius of the Project Area

Site Designation	Period	Site Type	Date
	/ Historic		
CA-SDI-14795	Prehistoric	Shell midden	1984
CA-SDI-14971	Prehistoric	Temporary camp with midden	1998
CA-SDI-15065	Historic	Foundation and structure pads	1998
CA-SDI-15376	Prehistoric	Lithic and shell scatter	1999
CA-SDI-16164	Historic	Historic refuse deposit	2002
CA-SDI-16695*	Prehistoric	Temporary camp	1977
CA-SDI-16696*	Prehistoric	Shell scatter	1977
CA-SDI-16698	Prehistoric	Temporary camp	1998
CA-SDI-18608*	Prehistoric	Hearth feature	1975
CA-SDI-20031	Prehistoric	Temporary camp	2010
CA-SDI-20032	Prehistoric	Shell scatter	2010
CA-SDI-20033	Prehistoric	Lithic and shell scatter	2010

*Denotes resources within the project footprint.

Air Quality Analysis for the El Camino Real Bridge/Road Widening Project, City of San Diego Project No. 2982 SCH No. 1999071104

Prepared for

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Engineering and Capital Projects Department
Right-of-Way Division
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December 10, 2014

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1.0 Summary

This report evaluates potential local and regional air quality impacts associated with the proposed El Camino Real Bridge/Road Widening Project (Project). The road being modified is the segment of El Camino Real that runs from Via de la Valle on the north to San Dieguito Road on the south. The road segment includes a bridge over the San Dieguito River that crosses the river approximately 0.3 mile south of the intersection of Via de la Valle and El Camino Real. The City of San Diego proposes to modify this segment of El Camino Real and replace the bridge in order to improve the structural integrity of the bridge, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, reduce traffic congestion, and improve consistency with the adopted land use plan in the Project area. Via de la Valle from the intersection of existing El Camino Real eastward to El Camino Real North also would be widened to accommodate the proposed new configuration of El Camino Real. The site is located approximately 1.25 miles east of Interstate 5. It is accessible from the east and west by Via de la Valle and from the south by Del Mar Heights Road.

As detailed below, maximum daily construction emissions are not projected to exceed the applicable City air quality emissions threshold under any of the alternatives. Therefore, construction related air quality impacts would be less than significant.

Future operational emissions from the proposed Project would be less than significant for all alternatives.

The proposed Project would not expose sensitive receptors to substantial carbon monoxide concentrations, diesel particulate matter, or odors. Additionally, the proposed Project would not conflict with any regional air quality plans.

2.0 Introduction and Project Description

The purpose of this report is to assess potential short- and long-term local and regional air quality impacts resulting from development of the Project.

Air pollution affects all southern Californians. Effects can include the following:

- Increased respiratory infection
- Increased discomfort
- Missed days from work and school
- Increased mortality.

Polluted air also damages agriculture and our natural environment.

The City is located within the San Diego Air Basin (SDAB), one of 15 air basins that geographically divide the state of California. The SDAB is currently classified as a federal nonattainment area for ozone and a state nonattainment area for particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and ozone.

Air quality impacts can result from the construction and operation of the proposed Project. Construction impacts are short term and result from fugitive dust, equipment exhaust, and indirect effects associated with construction workers and deliveries. Operational impacts can occur on two levels: regional impacts resulting from growth-inducing development or local hot-spot effects stemming from sensitive receivers being placed close to highly congested roadways. In the case of this Project, operational impacts would be primarily due to emissions to the basin from mobile sources associated with the vehicular travel along the roadways within the Project area.

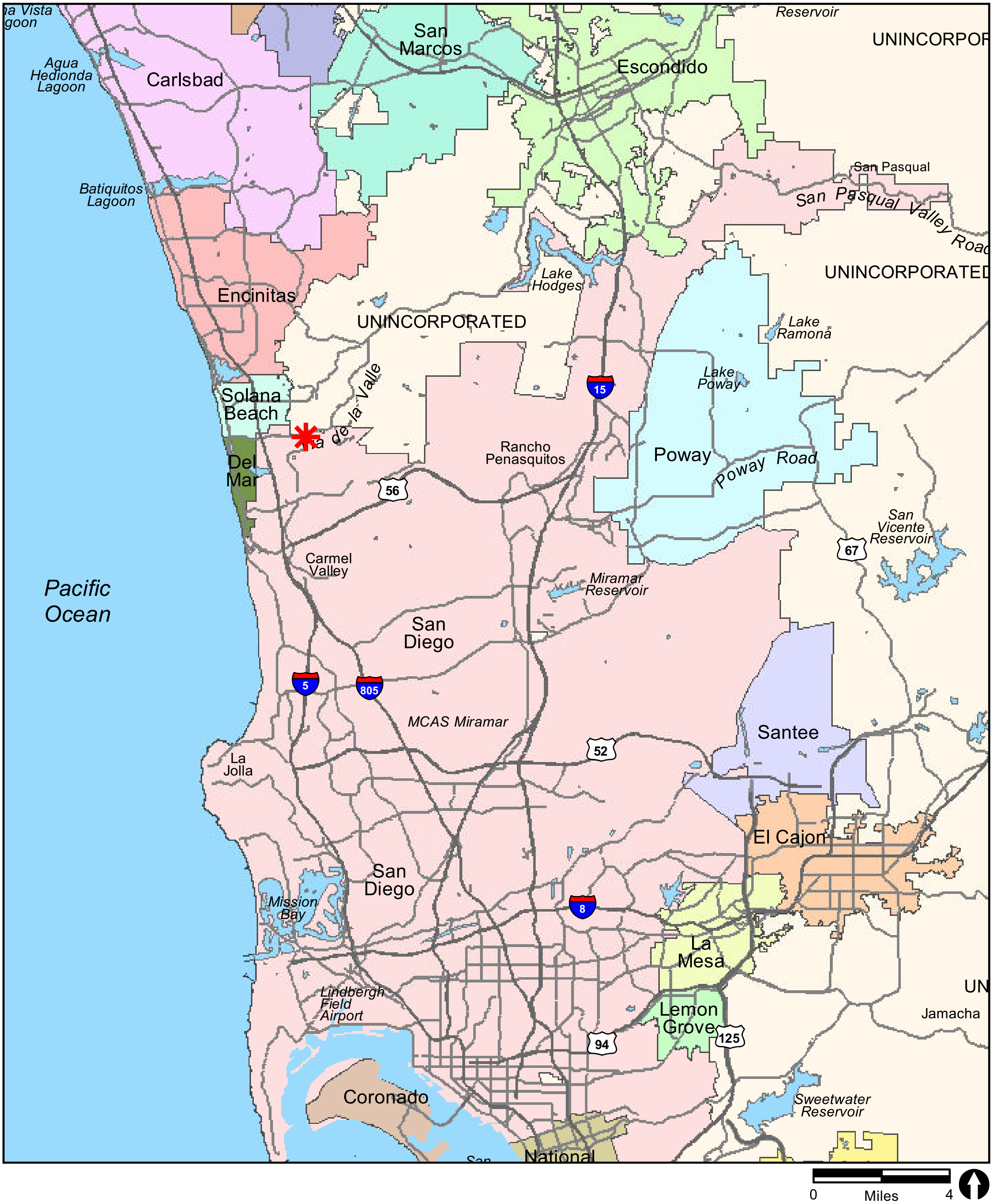
The analysis of impacts is based on state and federal ambient air quality standards and is assessed in accordance with the guidelines, policies, and standards established by the City of San Diego (City) and the San Diego County Air Pollution Control District (SDAPCD).

2.1 Project Description

2.1.1 Project Location and Purpose

The Project is located in the City and in San Diego County, California. The site is located approximately 1.25 miles east of Interstate 5 (I-5; Figures 1 and 2). It is accessible from the east and west by Via de la Valle and from the south by Del Mar Heights Road. The road being modified is the segment of El Camino Real that runs from Via de la Valle on the north to San Dieguito Road on the south. The Project site is located on the U.S. Geological Survey (USGS) Del Mar Quadrangle, Sections 6 and 7, Township 14 South, and Range 3 West (Figure 3). Figure 4 shows the Project location on a scale of 800 feet per inch.

The 2,400-foot-long and 23-foot-wide segment of El Camino Real, currently classified as a two-lane collector, has one travel lane in each direction and has no shoulders, bicycle lanes, or pedestrian walkways. The road segment includes a bridge, which crosses over the San Dieguito River approximately 0.3 mile south of the intersection of Via de la Valle and El Camino Real. The bridge is not high enough to completely allow 100-year flood levels to pass. The City proposes to modify this segment of El Camino Real and replace the bridge in order to improve the bridge's structural integrity over the San Dieguito River, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, reduce traffic congestion,



Project Location

FIGURE 1

Regional Location

RECON

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Image Source: Aerials Express (flown March 2010)

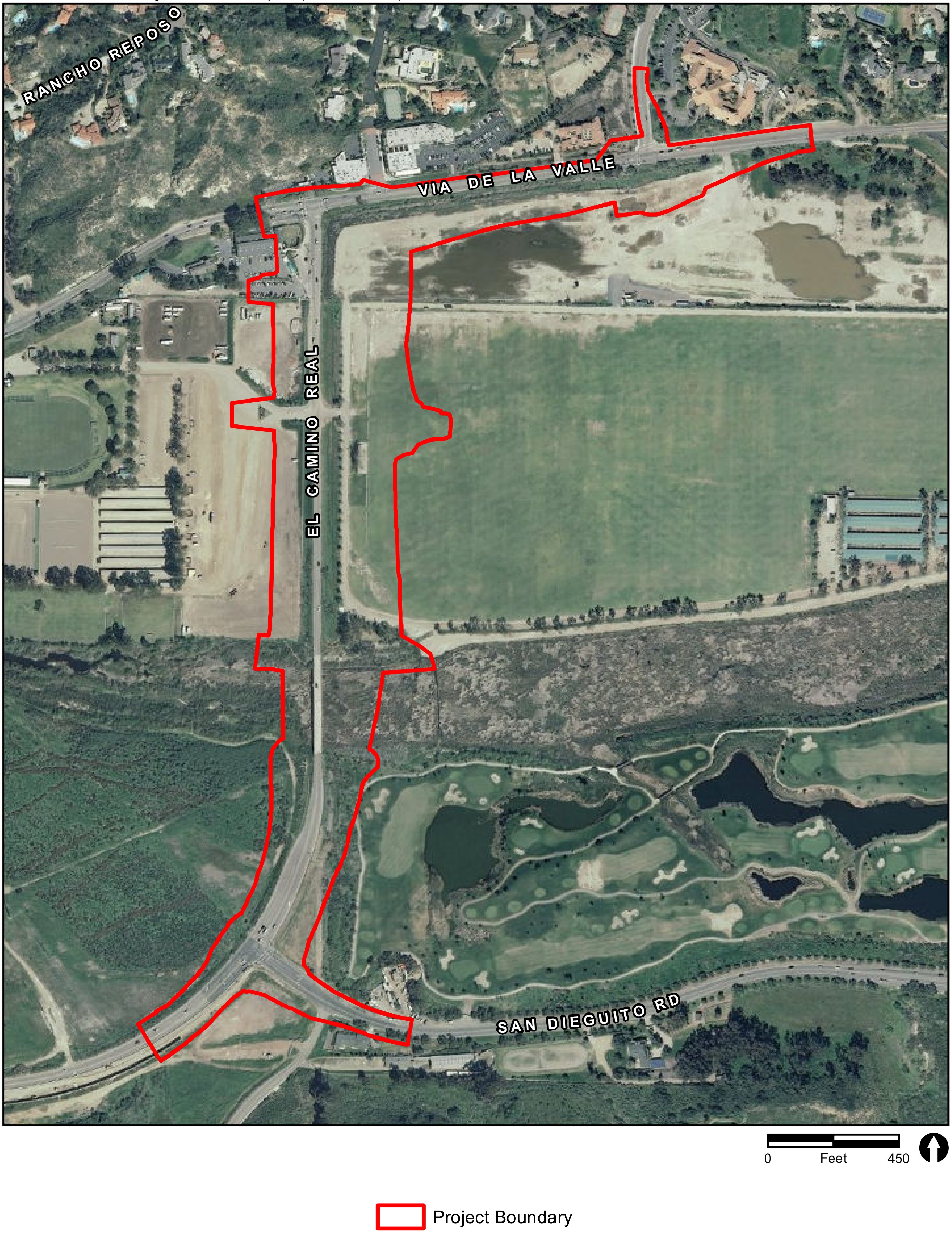

FIGURE 2

Project Location on Aerial Photograph

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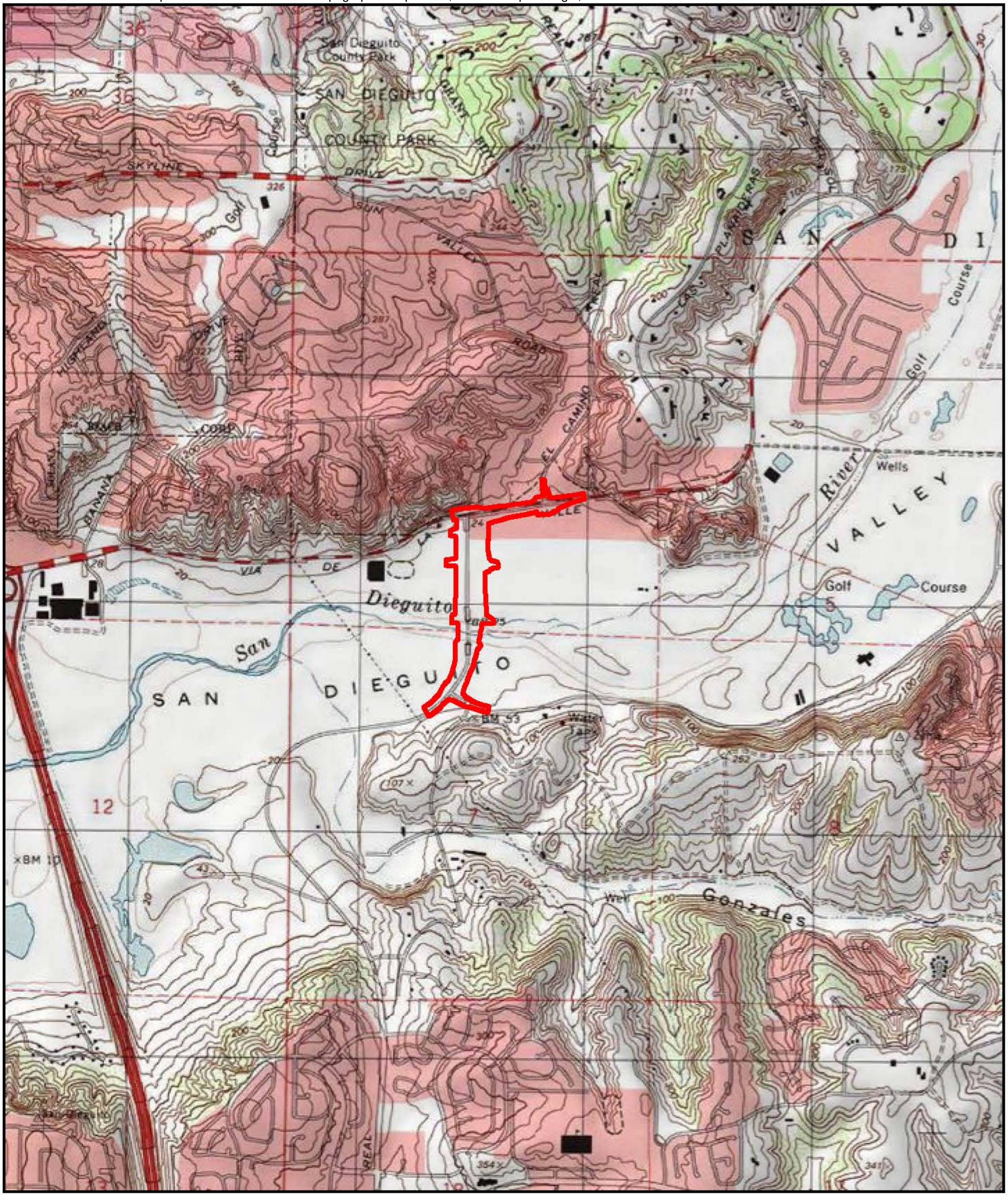
Map Source: USGS 7.5 minute topographic map series, DEL MAR quadrangle, T14SR03W



0 Feet 2,000

Project Boundary

FIGURE 3

Project Location on USGS Map

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Map Source: City of San Diego, Engineering and Development Department, City 800' Maps, Number 298-1689, 298-1701, and 290-1689

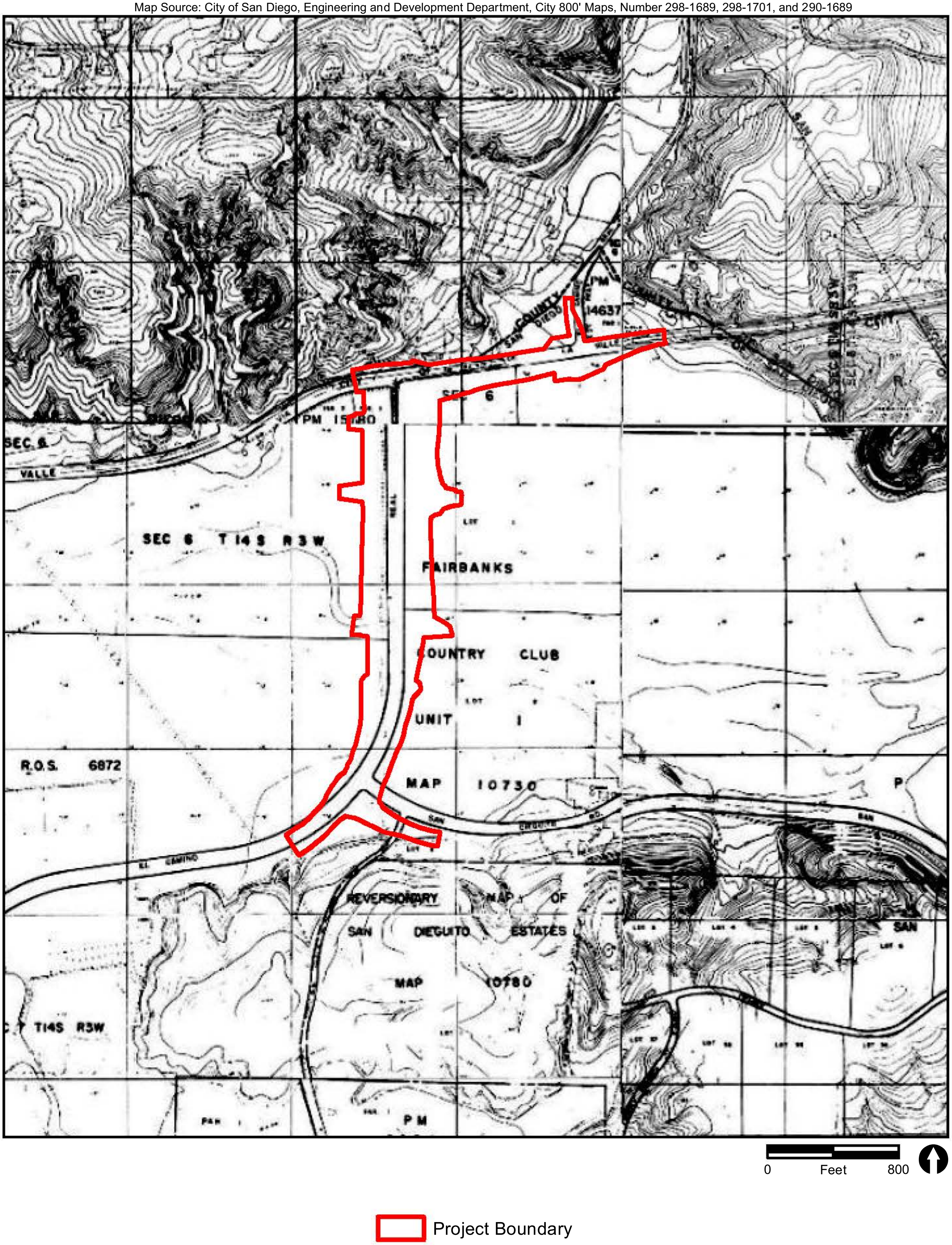

FIGURE 4

Project Location on 800' Scale Map

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and improve consistency with the adopted land use plan in the Project area. Via de la Valle from the intersection of existing El Camino Real eastward to El Camino Real North also would be widened to accommodate the proposed new configuration of El Camino Real.

The proposed Project is being analyzed in an Environmental Impact Report (EIR) to satisfy the California Environmental Quality Act (CEQA) for the City, and in a separate Environmental Assessment (EA) for California Department of Transportation (Caltrans)/Federal Highway Administration (FHWA) to satisfy the National Environmental Policy Act (NEPA). This air quality technical report is being prepared in support of the CEQA documentation. A separate air quality report will be prepared for the NEPA document.

2.1.2 General Setting

The affected portion of El Camino Real is situated within the northwestern part of the North City Future Urbanizing Area (NCFUA), a diverse planning area that extends from I-5 on the west to Interstate 15 (I-15) on the east, and from Los Peñasquitos Canyon on the south to Santa Fe Valley on the north. The NCFUA Framework Plan (City of San Diego 1995) was initially adopted by the City Council in 1992 as an amendment to the General Plan in effect at that time. City zoning and the Framework Plan are the governing land use documents for the Project area, although lands east of existing El Camino Real and north of Via de la Valle are outside of the NCFUA. El Camino Real is identified on the 2008 General Plan Land Use and Street System Map (Land Use Element, Figure LU-2).

Existing land uses along El Camino Real between Via de la Valle and San Dieguito Road include commercial, agricultural, recreational, and open space. Land uses along the west side of El Camino Real, from north to south, are Mary's Tack and Feed (a commercial establishment), Del Mar Horsepark (Horsepark; an equestrian facility owned by the State of California 22nd District Agricultural Association), and undeveloped parcels owned by the San Dieguito River Park Joint Powers Authority (JPA). Specific land uses along the east side of El Camino Real, from north to south, are undeveloped privately owned property, Polo Club fields owned by the City, and the expanded Fairbanks Ranch Country Club golf course, owned by the City. The commercial buildings along the north side of Via de la Valle are in the county of San Diego.

Most of El Camino Real within the study area is in the 100-year floodplain of the San Dieguito River, as are the lands east and west of the road in this location. The existing 100-year floodplain covers the majority of the valley floor including the Polo Club fields and portions of the Horsepark.

2.1.3 Alternatives Analyzed

The build alternatives analyzed at an equal level of detail in the EIR are the following:

- Central Alignment Alternative
- Road Capacity Alternative
- Bicycle Safety Alternative
- Western Alignment Alternative
- Eastern Alignment Alternative
- Roundabout Alternative
- Lower Elevation Alternative

It should be noted that for this Project, two alternatives analyzed in the EIR are not considered viable by Caltrans/FHWA, because they do not provide all features needed to completely meet the purpose and need. These are the Road Capacity Alternative and the Bicycle Safety Alternative. The City would not be able to receive federal funds if either of those alternatives were chosen; thus, the two alternatives are not analyzed in the EA. In addition, the Lower Elevation Alternative is not analyzed separately in the EA because it has the same configuration as the Central Alignment.

The No Build (No Project) Alternative is evaluated in the EIR and the EA. This alternative represents the circumstance under which the Project does not proceed.

2.1.3.1 Common Design Features

All of the build alternatives would provide the following key components:

- The roadway bed of El Camino Real would be raised on fill above the 100-year flood level between San Dieguito Road and Via de la Valle and would meet existing grade at these locations.

- The bridge over the San Dieguito River would be demolished and replaced with a new structure constructed above the 100-year flood level. The new bridge would be supported on cylindrical bridge piles and finished concrete columns. Abutments under the bridge would be protected from erosion by riprap, and the bank slope under the new bridge would be steepened to be approximately 1.5:1.

- All build alternatives except the Lower Elevation Alternative would provide an elevated multi-use trail undercrossing under the north bridge abutment. The trail undercrossing would be set at the 10-year flood level and would provide 12 feet of vertical clearance between the trail surface and the underside of the bridge. The new bridge height for alternatives with the trail undercrossing would be approximately 6 feet greater than the height of the existing bridge at the north abutment. The bridge height of the Lower Elevation Alternative would be only 3 feet higher, because this alternative would not include the trail undercrossing.

- Via de la Valle would be widened to its ultimate width from the modified intersection with El Camino Real eastward to El Camino Real North. The existing dual 19-inch-by-30-inch reinforced concrete pipe (RCP) storm drain culvert under Via de la Valle near El Camino Real North would be replaced with an underground triple reinforced concrete box (RCB) sized to pass the 100-year peak storm event from the upstream tributary north of Via de la Valle onto the property south of Via de la Valle. The 100-year peak storm event for that tributary is approximately 680 cubic feet per second (cfs).

- Project impacts to wetlands would be mitigated by enhancement and creation on a parcel owned by the JPA located west of the affected portion of El Camino Real.

2.1.3.2 Key Characteristics of Each Alternative

Key characteristics of the build alternatives are highlighted below.

- Central Alignment Alternative: This alternative would be roughly centered on the existing alignment of El Camino Real and would impact neighboring properties on the east and west sides of the road relatively equally. El Camino Real would be widened to 104 feet to accommodate four travel lanes, a raised central median, bicycle lanes, and pedestrian walkways/parkways. The road would be elevated above the 100-year flood level on fill with 2:1 side slopes.

- Road Capacity Alternative: This alternative would have an alignment that is shifted west to avoid impacts to the wetlands in the drainage ditch parallel to the eastern edge of El Camino Real. El Camino Real would be widened to 60 feet to accommodate four travel lanes and a striped 2-foot-wide median. This alternative would not provide left-turn pockets, a raised central median, pedestrian walkways, parkways, or bicycle lanes. El Camino Real would be elevated above the 100-year flood level on fill with vertical retaining walls on both sides in order to keep the cross section as narrow as possible.

- Bicycle Safety Alternative: This alternative would have an alignment that is shifted west to avoid impacts to the wetlands in the drainage ditch parallel to the eastern edge of El Camino Real. El Camino Real would be widened to 60 feet to accommodate two travel lanes, bicycle lanes, and a raised central median. This alternative would not provide pedestrian walkways, parkways, or additional travel lanes. El Camino Real would be elevated above the 100-year flood level on fill with vertical retaining walls on both sides in order to keep the cross section as narrow as possible.

- Western Alignment Alternative: This alternative would have an alignment that is shifted west to avoid impacts to the wetlands in the drainage ditch parallel to the eastern edge of El Camino Real. El Camino Real would be widened to 104 feet to accommodate four travel lanes, a raised central median, bicycle lanes, and pedestrian walkways/parkways. The road would be elevated above the 100-year flood level on fill with 2:1 side slopes.

- Eastern Alignment Alternative: This alternative would have an alignment that is shifted completely east of the drainage ditch to allow independent construction of the bridge, minimize impacts to developed properties along the western side of El Camino Real (Horsepark and Mary's Tack and Feed), and reduce impacts to wetlands in the drainage ditch parallel to the eastern edge of El Camino Real. El Camino Real would be widened to 104 feet to accommodate four travel lanes, a raised central median, bicycle lanes, and pedestrian walkways/parkways. The road would be elevated above the 100-year flood level on fill with 2:1 side slopes and would intersect with Via de la Valle at De La Valle Place, east of the existing intersection of El Camino Real with Via de la Valle.

- Roundabout Alternative: This alternative would be in the same alignment as the Eastern Alignment Alternative. For the Roundabout Alternative, however, roundabouts instead of signalized intersections would be located where El Camino Real meets San Dieguito Road, the Polo Field/Horsepark driveways, and De La Valle Place, and where Via de la Valle meets El Camino Real North. The footprint of the Roundabout Alternative would be larger than for the Eastern Alignment Alternative due to the need for transitions eastward and northward at the intersection of Via de la Valle and El Camino Real North, and the need for additional area to accommodate the roundabouts compared to typical intersections.

- Lower Elevation Alternative: This alternative would be roughly centered on the existing alignment of El Camino Real and would impact neighboring properties on the east and west sides of the road relatively equally. El Camino Real would be widened to 104 feet to accommodate four travel lanes, a raised central median, bicycle lanes, and pedestrian walkways/parkways. The road would be elevated just to the 100-year flood level on fill with 2:1 side slopes.

For any of the alternatives, a staging area has been proposed at the southern end of the Project area, just northeast of the junction of El Camino Real and San Dieguito Road. The Project would be constructed in stages, where the existing road and bridge would remain open during construction until one new side is constructed, then traffic would be diverted to the new side while the other side of the road and bridge are constructed. For the Eastern Alignment Alternative, the bridge and road north of the bridge would be constructed in one stage, independent of the existing bridge and road. Construction would require 12 to 18 months of actual construction, depending on the alternative.

However, due to limitations associated with biological resources adjacent to the project, overall construction would last approximately 2.5 to 3.5 years.

2.1.4 Wetland Mitigation Planning

Impacts to wetlands would occur for all build alternatives. Mitigation is planned to be accomplished on a parcel owned by the JPA. The JPA Mitigation Area, formerly known as the Boudreau property, is located west of El Camino Real and south of the San Dieguito River. Historically, this area has supported agricultural practices but has remained fallow for several years. The City is currently exploring mitigation opportunities with the San Diego Association of Governments (SANDAG) and Caltrans through their restoration project at San Dieguito Lagoon. This would allow the City to incorporate the JPA Mitigation Area proposed for the Project into a large-scale restoration effort.

3.0 Regulatory Framework

Motor vehicles are San Diego County's leading source of air pollution and the largest contributor to greenhouse gases (County of San Diego 2008). In addition to these sources, other mobile sources include construction equipment, trains, and airplanes.

Emission standards for mobile sources are established by state and federal agencies such as the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (U.S. EPA). Reducing mobile source emissions requires the technological improvement of existing mobile sources and the examination of future mobile sources such as those associated with new or modification projects. The State of California has developed state-wide programs to encourage cleaner cars and cleaner fuels. Since 1996, smog-forming emissions from motor vehicles have been reduced by 15 percent, and the cancer risk from exposure to motor vehicle air toxics has been reduced by 40 percent (County of San Diego 2008). The regulatory framework described below details the federal and state agencies that are in charge of monitoring and controlling mobile source air pollutants and the measures currently being taken to achieve and maintain healthful air quality in the SDAB.

In addition to mobile sources, stationary sources also contribute to air pollution in the SDAB. Stationary sources include gasoline stations, power plants, dry cleaners, and other commercial and industrial uses. Stationary sources of air pollution are regulated by the local air pollution control or management district, in this case the SDAPCD.

The state of California is divided geographically into 15 air basins for the purpose of managing the air resources of the state on a regional basis. Areas within each air basin are considered to share the same air masses and, therefore, are expected to have similar ambient air quality. If an air basin is not in either federal or state attainment for a particular pollutant, the basin is classified as a moderate, serious, severe, or extreme nonattainment area (there is also a marginal classification for federal nonattainment areas).

3.1 Federal Regulations

Ambient Air Quality Standards (AAQS) represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect the public health and welfare. The federal Clean Air Act was enacted in 1970 and amended in 1977 and 1990 (42 United States Code [USC] 7401) for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity. In 1971, in order to achieve the purposes of Section 109 of the Clean Air Act (42 USC 7409), the U.S. EPA developed primary and secondary national ambient air quality standards (NAAQS).

Six pollutants of primary concern have been designated: ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), lead (Pb), and respirable particulate matter (PM_{10}, and $PM_{2.5}$).

The primary NAAQS ". . . in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health . . . " and the secondary standards ". . . protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air" (42 U.S.C. 7409(b)(2)). The primary standards were established, with a margin of safety, considering long-term exposure for the most sensitive groups in the general population (i.e., children, senior citizens, and people with breathing difficulties). California and national AAQS are presented in Table 1 (State of California 2013).

TABLE 1
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone	1 Hour	0.09 ppm (180 $\mu g/m^3$)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.07 ppm (137 $\mu g/m^3$)		0.075 ppm (147 $\mu g/m^3$)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 $\mu g/m^3$	Gravimetric or Beta Attenuation	150 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 $\mu g/m^3$		–		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		35 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 $\mu g/m^3$	Gravimetric or Beta Attenuation	15 $\mu g/m^3$		
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-dispersive Infrared Photometry	35 ppm (40 mg/m^3)	–	Non-dispersive Infrared Photometry
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	–	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–	–	
Nitrogen Dioxide (NO_2) [8]	1 Hour	0.18 ppm (339 $\mu g/m^3$)	Gas Phase Chemi-luminescence	100 ppb (188 $\mu g/m^3$)	–	Gas Phase Chemi-luminescence
	Annual Arithmetic Mean	0.030 ppm (57 $\mu g/m^3$)		53 ppb (100 $\mu g/m^3$)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[9]	1 Hour	0.25 ppm (655 $\mu g/m^3$)	Ultraviolet Fluorescence	75 ppb (196 $\mu g/m^3$)	–	Ultraviolet Fluorescence; Spectro photometry (Pararosaniline Method)
	3 Hour	–		–	0.5 ppm (1300 $\mu g/m^3$)	
	24 Hour	0.04 ppm (105 $\mu g/m^3$)		0.14 ppm (for certain areas)[9]	–	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas)[9]	–	
Lead[10,11]	30 Day Average	1.5 $\mu g/m^3$	Atomic Absorption	–	–	High Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 $\mu g/m^3$ (for certain areas)[11]	Same as Primary Standard	
	Rolling 3-Month Average	–		0.15 $\mu g/m^3$		
Visibility Reducing Particles[12]	8 Hour	See footnote 12	Beta Attenuation and Transmittance through Filter Tape	No Federal Standards		
Sulfates	24 Hour	25 $\mu g/m^3$	Ion Chroma-tography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 $\mu g/m^3$)	Ultraviolet Fluorescence			
Vinyl Chloride[10]	24 Hour	0.01 ppm (26 $\mu g/m^3$)	Gas Chroma-tography			

See footnotes on next page.

SOURCE: State of California 2013.

TABLE 1
AMBIENT AIR QUALITY STANDARDS
(continued)

ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter; – = not applicable.

[1]California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, particulate matter (PM_{10}, $PM_{2.5}$, 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 arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site 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 the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. 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 U.S. EPA for further clarification and current national 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 measurement method which can be shown to the satisfaction of the Air Resources Board 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 U.S. 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 U.S. EPA.

[8]To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.

[9]On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[10]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.

[11]The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[12]In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are “extinction of 0.23 per kilometer” and “extinction of 0.07 per kilometer” for the statewide and Lake Tahoe Air Basin standards, respectively.

3.2 State Regulations

3.2.1 California Ambient Air Quality Standards

The U.S. EPA allows states the option to develop different (stricter) standards. The State of California generally has set more stringent limits on the seven criteria pollutants (see Table 1). In addition to the federal criteria pollutants, the California ambient air quality standards (CAAQS) also specify standards for visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride (see Table 1). The SDAB is a nonattainment area for the state ozone standards, the state PM_{10} standard, and the state $PM_{2.5}$ standard. It is in attainment of the state's standards for all of the other criteria air pollutants (State of California 2013).

3.2.2 California Clean Air Act

The California Clean Air Act requires that districts assess their progress triennially and report to CARB as part of the triennial plan revisions. The California Clean Air Act additionally requires that districts implement regulations to reduce emissions from mobile sources through the adoption and enforcement of transportation control measures. The California Clean Air Act requires that a district must (South Coast Air Quality Management District [SCAQMD] 2007):

- Demonstrate the overall effectiveness of the air quality program;
- Reduce nonattainment pollutants at a rate of 5 percent per year, or include all feasible measures and expeditious adoption schedule;
- Reduce population exposure to severe nonattainment pollutants according to a prescribed schedule; and
- Rank control measures by cost-effectiveness.

Through statewide programs to encourage cleaner cars and cleaner fuels, California has, since 1996, reduced smog-forming emissions from motor vehicles by 15 percent and the cancer risk from exposure to motor vehicle air toxics by 40 percent (County of San Diego 2008).

3.3 Toxic Air Contaminants

The public's exposure to toxic air contaminants (TACs) is a significant public health issue in California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health (AB 1807: Health and Safety Code Sections 39650–39674). The Legislature established a two-step process to address the potential health effects from TACs. The first step is the risk assessment (or identification) phase. The second step is the risk management (or control) phase of the process.

The California Air Toxics Program establishes the process for the identification and control of toxic air contaminants and includes provisions to make the public aware of significant toxic exposures and for reducing risk. Additionally, the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly) was enacted in 1987 and requires stationary sources to report the types and quantities of certain substances routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, identify facilities having localized impacts, ascertain health risks, notify nearby residents of significant risks, and reduce those significant risks to acceptable levels. The Children's Environmental Health Protection Act, Senate Bill 25 (Chapter 731, Escutia, Statutes of 1999), focuses on children's exposure to air pollutants. The act requires CARB to review its air quality standards from a children's health perspective, evaluate the statewide air monitoring network, and develop any additional air toxic control measures needed to protect children's health. Locally, toxic air pollutants are regulated through the SDAPCD’s Regulation XII. Of particular concern statewide are diesel-exhaust particulate matter emissions. Diesel-exhaust particulate matter was established as a TAC in 1998 and is estimated to represent a majority of the cancer risk from TACs statewide (based on the statewide average). Diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB and are listed as carcinogens either under the state's Proposition 65 or under the federal Hazardous Air Pollutants program.

Following the identification of diesel particulate matter as a TAC in 1998, CARB has worked on developing strategies and regulations aimed at reducing the risk from diesel particulate matter. The overall strategy for achieving these reductions is found in the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles (State of California 2000). A stated goal of the plan is to reduce the cancer risk statewide arising from exposure to diesel particulate matter 85 percent by 2020.

In April 2005, CARB published the *Air Quality and Land Use Handbook: A Community Health Perspective* (State of California 2005a). The handbook makes recommendations directed at protecting sensitive land uses from air pollutant emissions while balancing a myriad of other land use issues (e.g., housing, transportation needs, economics, etc.). It notes that the handbook is not regulatory or binding on local agencies and recognizes that application takes a qualitative approach. As reflected in the CARB Handbook, there is currently no adopted standard for the significance of health effects from mobile sources. Therefore, the CARB has provided guidelines for the siting of land uses near heavily traveled roadways. Of pertinence to this study, the CARB guidelines indicate that siting new sensitive land uses within 500 feet of a freeway or urban roads with 100,000 or more vehicles/day should be avoided when possible.

As an ongoing process, CARB will continue to establish new programs and regulations for the control of diesel-particulate and other air-toxics emissions as appropriate. The continued development and implementation of these programs and policies will ensure that the public's exposure to diesel particulate matter will continue to decline.

The SDAPCD also started sampling for TACs at the Chula Vista and El Cajon monitoring stations in the mid-1980s. Once every 12 days, 24-hour samples are performed. Excluding diesel particulates, Chula Vista has shown a 72 percent reduction in the ambient incremental cancer risk from TACs since 1989, while El Cajon has shown a 71 percent reduction during the same period. In 2009, the estimated ambient incremental cancer risk was 135 in one million for Chula Vista and 157 in one million for El Cajon, down from 481 and 545 in one million, respectively, in 1989 (County of San Diego 2011).

Additionally, the SDAPCD implements rules and regulations for the control of toxic air contaminants through mandatory permitting of stationary and portable major emitters of air pollutants.

3.4 State Implementation Plan

The SIP is a collection of documents that set forth the state's strategies for achieving the federal air quality standards. The SDAPCD is responsible for preparing and implementing the portion of the SIP applicable to the SDAB. The SDAPCD adopts rules, regulations, and programs to attain state and federal air quality standards, and appropriates money (including permit fees) to achieve these objectives.

3.5 California Environmental Quality Act

Section 15125(d) of the CEQA Guidelines requires discussion of any inconsistencies between the project and applicable general plans and regional plans, including the applicable air quality attainment or maintenance plan (or SIP).

3.6 San Diego Air Pollution Control District

The SDAPCD is the agency that regulates air quality in the SDAB. The SDAPCD prepared the 1991/1992 Regional Air Quality Strategy (RAQS) in response to the requirements set forth in AB 2595. Attached, as part of the RAQS, are the Transportation Control Measures (TCMs) for the air quality plan prepared by the San Diego Association of Governments (SANDAG) in accordance with AB 2595 and adopted by SANDAG on March 27, 1992, as Resolution Number 92-49 and Addendum (SANDAG 2009). The RAQS and TCM set forth the steps needed to accomplish attainment of state ambient air quality standards. The required triennial updates of the RAQS and corresponding TCMs were adopted in 1995, 1998, 2001, 2004, and 2009.

The SDAPCD has also established a set of rules and regulations initially adopted on January 1, 1969, and periodically reviewed and updated. These rules and regulations are available for review on the agency's website.

4.0 Environmental Setting

4.1 Geographic Setting

The Project area is located within the western portion of the SDAB, which encompasses the entire County of San Diego. The westerly, coastal areas of the SDAB typically experience westerly winds which direct pollutants eastward, as described below. The eastern portion of the SDAB is surrounded by mountains to the north, east, and south. These mountains tend to restrict airflow and concentrate pollutants in the valleys and low-lying areas below.

4.2 Climate

The Project is located about 2.5 miles east of the Pacific Ocean and, like the rest of San Diego County's coastal areas, has a Mediterranean climate characterized by warm, dry summers and mild, wet winters. The mean annual temperature for the Project area is 63 degrees Fahrenheit (°F). The average annual precipitation is 10 inches, falling primarily from November to April. Winter low temperatures in the Project area average about 49°F, and summer high temperatures average about 74°F. The average relative humidity is 69 percent and is based on the yearly average humidity at Lindbergh Field (Western Regional Climate Center [WRCC] 2011).

The dominant meteorological feature affecting the region is the Pacific High Pressure Zone, which produces the prevailing westerly to northwesterly winds. These winds tend to blow pollutants away from the coast toward the inland areas. Consequently, air quality near the coast is generally better than that which occurs at the base of the coastal mountain range.

Fluctuations in the strength and pattern of winds from the Pacific High Pressure Zone interacting with the daily local cycle produce periodic temperature inversions that influence the dispersal or containment of air pollutants in the SDAB. Beneath the inversion layer pollutants become "trapped" as their ability to disperse diminishes. The mixing depth is the area under the inversion layer. Generally, the morning inversion layer is lower than the afternoon inversion layer. The greater the change between the morning and afternoon mixing depths, the greater the ability of the atmosphere to disperse pollutants.

Throughout the year, the height of the temperature inversion in the afternoon varies between approximately 1,500 and 2,500 feet above mean sea level (MSL). In winter, the morning inversion layer is about 800 feet above MSL. In summer, the morning inversion layer is about 1,100 feet above MSL. Therefore, air quality generally tends to be better in the winter than in the summer.

The prevailing westerly wind pattern is sometimes interrupted by regional "Santa Ana" conditions. A Santa Ana occurs when a strong high pressure develops over the Nevada–Utah area and overcomes the prevailing westerly coastal winds, sending strong, steady, hot, dry northeasterly winds over the mountains and out to sea.

Strong Santa Anas tend to blow pollutants out over the ocean, producing clear days. However, at the onset or during breakdown of these conditions or if the Santa Ana is weak, local air quality may be adversely affected. In these cases, emissions from the South Coast Air Basin (SCAB) to the north are blown out over the ocean, and low pressure over Baja California draws this pollutant-laden air mass southward. As the high pressure weakens, prevailing northwesterly winds reassert themselves and send this cloud of contamination ashore in the SDAB. When this event does occur, the combination of transported and locally produced contaminants produce the worst air quality measurements recorded in the basin.

4.3 Existing Air Quality

Air quality at a particular location is a function of the kinds, amounts, and dispersal rates of pollutants being emitted into the air locally and throughout the basin. The major factors affecting pollutant dispersion are wind speed and direction, the vertical dispersion of pollutants (which is affected by inversions), and the local topography.

Air quality is commonly expressed as the number of days in which air pollution levels exceed state standards set by the CARB or federal standards set by the U.S. EPA (State of California 2014). The SDAPCD maintains 10 air quality monitoring stations located throughout the greater San Diego metropolitan region. Air pollutant concentrations and meteorological information are continuously recorded at these 10 stations. Measurements are then used by scientists to help forecast daily air pollution levels. Table 2 summarizes the number of days per year during which state and federal standards were exceeded in the SDAB overall during the years 2007 to 2011.

The Del Mar–Mira Costa College monitoring station, located 2.4 miles southwest of the Project area, the San Diego–Overland monitoring station, located 11.2 miles southeast of the Project area, and the San Diego–Union Street monitoring station, located 18.2 miles south of the Project area, are the coastal monitoring stations nearest to the Project area (Figure 5). The Del Mar–Mira Costa College monitoring station only measures ozone. The San Diego–Overland monitoring station measures ozone, NO_2, PM_{10}, and $PM_{2.5.}$ The San Diego–Union Street monitoring station is the nearest coastal monitoring station that measured CO (CO measurements stopped after 2008). Table 3 provides a summary of measurements of ozone, CO, NO_2, PM_{10}, and $PM_{2.5}$ collected at the Del

Mar–Mira Costa College, San Diego–Overland, and San Diego–Union Street monitoring stations from 2009–2013.

4.3.1 Ozone

Nitrogen oxides and hydrocarbons (reactive organic gases) are known as the chief “precursors” of ozone. These compounds react in the presence of sunlight to produce O_3, which is the primary air pollution problem in the SDAB. Because sunlight plays such an important role in its formation, O_3 pollution, or smog, is mainly a concern during the daytime in summer months. The SDAB is currently designated a federal and state non-attainment area for ozone. During the past 20 years, San Diego had experienced a decline in the number of days with unhealthy levels of O_3 despite the region’s growth in population and vehicle miles traveled (County of San Diego 2009).

About half of smog-forming emissions come from automobiles. Population growth in San Diego County has resulted in a large increase in the number of automobiles expelling O_3-forming pollutants while operating on area roadways. In addition, the occasional transport of smog-filled air from the SCAB only adds to the SDAB’s O_3 problem. Stricter automobile emission controls, including more efficient automobile engines, have played a large role in why O_3 levels have steadily decreased.

In the SDAB overall, during the five-year period of 2007 to 2011 the state 1-hour O_3 standard of 0.09 ppm was exceeded 21 days in 2007, 18 days in 2008, 8 days in 2009, 7 days in 2010, and 5 days in 2011.The 1-hour state standard for O_3 of 0.09 ppm was exceeded four times at the Del Mar–Mira Costa College monitoring station and nine times at the San Diego–Overland Avenue monitoring station during the five-year period of 2007 to 2011.

In order to address adverse health effects due to prolonged exposure, the U.S. EPA phased out the national 1-hour O_3 standard and replaced it with the more protective 8-hour ozone standard. The SDAB is currently a nonattainment area for the previous (1997) national 8-hour standard and is proposed as a nonattainment area for the revised (2008) national 8-hour standard of 0.075 ppm.

In the SDAB overall, the revised national 8-hour standard of 0.075 was exceeded 27 days in 2007, 35 days in 2008, 24 days in 2009, 14 days in 2010, and 10 days in 2011. The stricter state 8-hour ozone standard of 0.07 ppm was exceeded 50 days in 2007, 69 days in 2008, 47 days in 2009, 21 days in 2010, and 33 days in 2011.

TABLE 2
AMBIENT AIR QUALITY SUMMARY – SAN DIEGO AIR BASIN

Pollutant	Average Time	California Ambient Air Quality Standards[a]	Attainment Status	National Ambient Air Quality Standards[b]	Attainment Status[c]	Maximum Concentration					Number of Days Exceeding State Standard					Number of Days Exceeding National Standard				
						2009	2010	2011	2012	2013	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
O_3	1 hour	0.09 ppm	N	N/A	N/A	0.119	0.107	0.114	0.101	0.095	8	7	5	2	2	N/A	N/A	N/A	N/A	N/A
O_3	8 hours	0.07ppm	N	0.075 ppm	N	0.098	0.088	0.093	0.084	0.083	47	21	33	25	28	24	14	10	10	7
CO	8 hours	9 ppm	A	9 ppm	A	3.24	2.46	2.44	3.61	Na	0	0	0	0	Na	0	0	0	0	Na
NO_2	1 hour	0.18 ppm	A	0.100 ppm	A	0.091	0.091	0.100	0.077	0.091	0	0	0	0	0	0	0	0	0	0
NO_2	Annual	0.030 ppm	A	0.053 ppm	A	0.021	0.021	0.020	0.020	0.019	NX	NX	NX	NX	NX	NX	NX	NX	NX	NX
PM_{10}	24 hours	50 $\mu g/m^3$	N	150 $\mu g/m^3$	U	123.0	108.0	126.0	126.0	92.0	25/146.4*	22/136.0*	23/138.5*	6/6.1*	1/6.0*	0/0.0*	0/0.0*	0/0.0*	0/0.0*	0/0.0*
PM_{10}	Annual	20 $\mu g/m^3$	N	N/A	N/A	53.9	47.0	46.2	24.3	25.4	EX	EX	EX	EX	EX	--	--	--	--	--
$PM_{2.5}$	24 hours	N/A	N/A	35 $\mu g/m^3$	A	78.4	52.2	72.0	82.9	68.1	--	--	--	--	--	4/3.4*	2/2.0*	3/3.0*	2/1.0*	3/2.0*
$PM_{2.5}$	Annual	12 $\mu g/m^3$	N	15 $\mu g/m^3$	A	12.2	10.8	15.9	14.2	10.6	EX	NX	EX	EX	NX	NX	NX	EX	NX	NX

SOURCE: County of San Diego 2014, State of California 2014. California Air Quality Data Statistics. California Air Resources Board Internet Site. URL http://www.arb.ca.gov/adam/welcome.html.
NOTE: Data for SO_2 and 1-hour CO were not available.
*Measured Days/Calculated Days - Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year. Data to determine federal calculated days were not available.
[a]California standards for ozone, carbon monoxide (except at Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, and PM_{10} are values that are not to be exceeded. Some measurements gathered for pollutants with air quality standards that are based upon 1-hour, 8-hour, or 24-hour averages, may be excluded if the CARB determines they would occur less than once per year on average.
[b]National standards other than for ozone and particulates, and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one.
[c]A = attainment; N = non-attainment; U = Unclassifiable; N/A = not applicable; Na = data not available; NX = annual average not exceeded; EX = annual average exceeded.
ppm = parts per million, $\mu g/m^3$ = micrograms per cubic meter.

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Image Source: Aerials Express (flown March 2010)

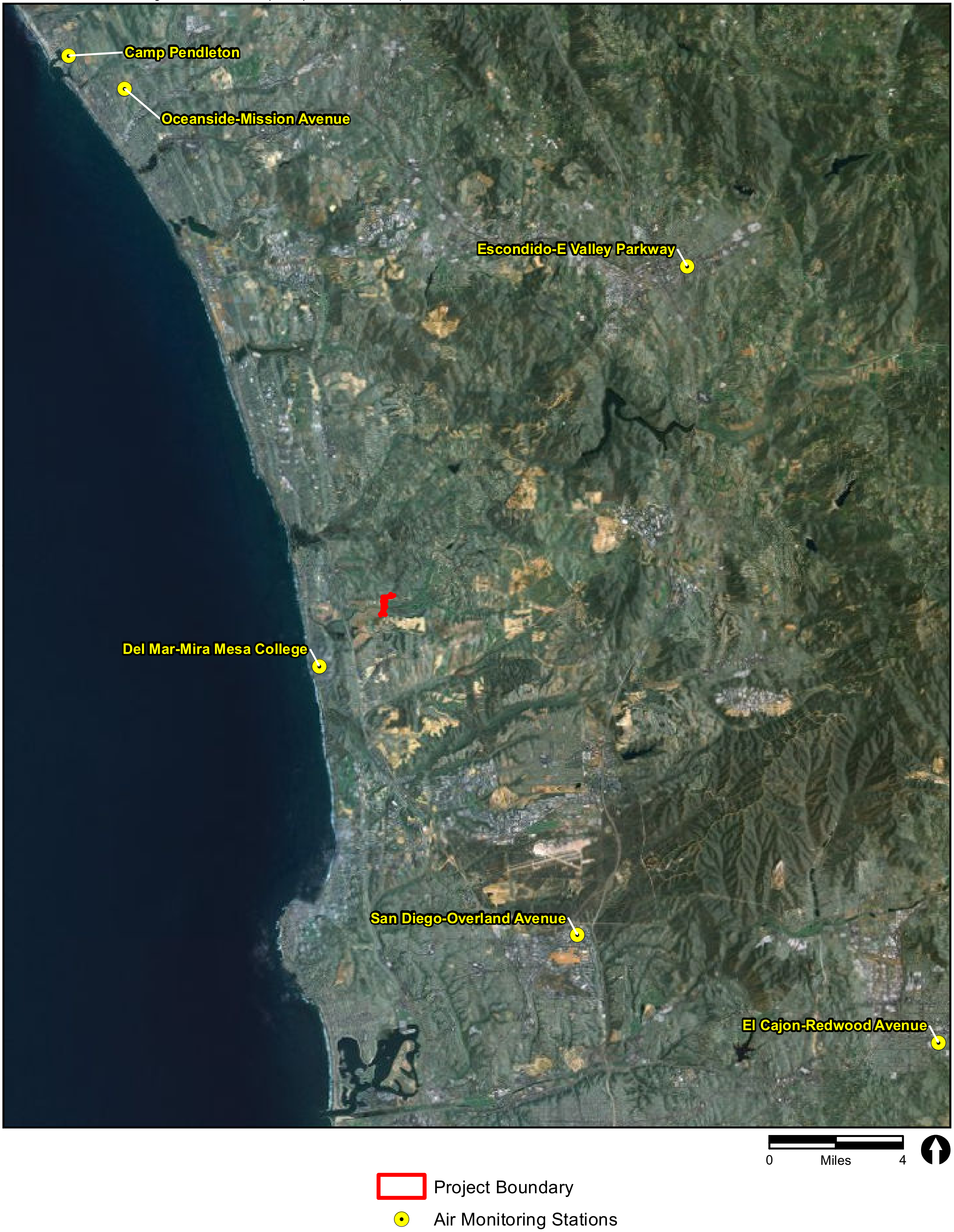

FIGURE 5

SDAPCD Air Monitoring Stations

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TABLE 3
SUMMARY OF AIR QUALITY MEASUREMENTS RECORDED AT THE DEL MAR–MIRA COSTA COLLEGE, SAN DIEGO–OVERLAND, AND SAN DIEGO–UNION STREET MONITORING STATIONS

Pollutant/Standard	2007	2008	2009	2010	2011
DEL MAR—MIRA COSTA COLLEGE					
Ozone					
Days State 1-hour Standard Exceeded (0.09 ppm)	1	2	1	0	0
Days State 8-hour Standard Exceeded (0.07 ppm)	4	11	3	2	1
Days Federal 1-hour Standard Exceeded (0.12 ppm)	0	0	0	0	0
Days ’08 Federal 8-hour Standard Exceeded (0.075 ppm)	3	3	1	0	0
Max. 1-hr (ppm)	0.110	0.117	0.097	0.085	0.091
Max 8-hr (ppm)	0.079	0.079	0.084	0.072	0.075
SAN DIEGO—OVERLAND AVENUE					
Ozone					
Days State 1-hour Standard Exceeded (0.09 ppm)	0	4	2	2	1
Days State 8-hour Standard Exceeded (0.07 ppm)	5	12	3	3	3
Days Federal 1-hour Standard Exceeded (0.12 ppm)	0	0	0	0	0
Days ’08 Federal 8-hour Standard Exceeded (0.075 ppm)	2	5	1	0	1
Max. 1-hr (ppm)	0.088	0.100	0.105	0.100	0.097
Max 8-hr (ppm)	0.076	0.093	0.082	0.074	0.087
Nitrogen Dioxide					
Days State 1-hour Standard Exceeded (0.18 ppm)	0	0	0	0	0
Max 1-hr (ppm)	0.087	0.077	0.060	0.073	0.073
Annual Average (ppm)	0.015	0.014	0.014	0.013	0.012
PM_{10}*					
Measured Days State 24-hour Standard Exceeded (50 $\mu g/m^3$)	1	0	0	0	0
Calculated Days State 24-hour Standard Exceeded (50 $\mu g/m^3$)	6.1	0	0	0	Na
Measured Days Federal 24-hour Standard Exceeded (150 $\mu g/m^3$)	0	0	0	0	0
Calculated Days Federal 24-hour Standard Exceeded (150 $\mu g/m^3$)	0	0	0	0	Na
Max. Daily ($\mu g/m^3$)	65.0	41.0	50.0	33.0	47.0
State Annual Average ($\mu g/m^3$)	23.6	23.8	24.9	18.7	Na
Federal Annual Average ($\mu g/m^3$)	23.2	23.5	24.7	18.6	20.5
$PM_{2.5}$*					
Measured Days ’97 Federal 24-hour Standard Exceeded (65 $\mu g/m^3$)	0	0	0	0	0
Calculated Days ’97 Federal 24-hour Standard Exceeded (65 $\mu g/m^3$)	Na	Na	0	0	Na
Measured Days ’06 Federal 24-hour Standard Exceeded (35 $\mu g/m^3$)	0	0	0	0	0
Calculated Days ’06 Federal 24-hour Standard Exceeded (35 $\mu g/m^3$)	Na	Na	0	0	Na
Max. Daily ($\mu g/m^3$)	30.6	27.2	25.1	18.7	18.3
State Annual Average ($\mu g/m^3$)	Na	Na	10.5	8.7	Na
Federal Annual Average ($\mu g/m^3$)	Na	Na	10.5	8.7	Na
SAN DIEGO—UNION STREET†					
Carbon Monoxide					
Days State 1-hour Standard Exceeded (20 ppm)	0	0	Na	Na	Na
Days State 8-hour Standard Exceeded (9 ppm)	0	0	Na	Na	Na
Days Federal 1-hour Standard Exceeded (35 ppm)	0	0	Na	Na	Na
Days Federal 8-hour Standard Exceeded (9 ppm)	0	0	Na	Na	Na
Max. 1-hr (ppm)	8.7	7.7	Na	Na	Na
Max. 8-hr (ppm)	5.18	2.24	Na	Na	Na

SOURCE: State of California 2013.
Na = Not available.
*Calculated days value. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.
†Stopped monitoring CO after 2008.

The revised national 8-hour standard of 0.075 ppm was exceeded seven times at the Del Mar–Mira Costa College monitoring station and nine times at the San Diego–Overland Avenue during the five-year period from 2007 to 2011. The stricter state 8-hour ozone standard of 0.07 ppm was exceeded 21 times at the Del Mar–Mira Costa College monitoring station and 26 times at the San Diego–Overland Avenue during the five-year period from 2007 to 2011.

Not all of the O_3 within the SDAB is derived from local sources. Under certain meteorological conditions, such as during Santa Ana wind events, O_3 and other pollutants are transported from the Los Angeles Basin and combine with O_3 formed from local emission sources to produce elevated O_3 levels in the SDAB.

Local agencies can control neither the source nor the transportation of pollutants from outside the air basin. The SDAPCD's policy, therefore, has been to control local sources effectively enough to reduce locally produced contamination to clean air standards. Through the use of air pollution control measures outlined in the RAQS, the SDAPCD has effectively reduced O_3 levels in the SDAB.

Actions that have been taken in the SDAB to reduce O_3 concentrations include:

- **TCMs, if vehicle travel and emissions exceed attainment demonstration levels.** TCMs are strategies that will reduce transportation-related emissions by reducing vehicle use or improving traffic flow.

- **Enhanced motor vehicle inspection and maintenance program.** The smog-check program is overseen by the Bureau of Automotive Repair. The program requires most vehicles to pass a smog test once every two years before registering in the state of California. The smog-check program monitors the amount of pollutants automobiles produce. One focus of the program is identifying "gross polluters," or vehicles that exceed two times the allowable emissions for a particular model. Regular maintenance and tune-ups, changing oil, and checking tire inflation can improve gas mileage and lower air pollutant emissions. It can also reduce traffic congestion due to preventable breakdowns, further lowering emissions.

- **Air Quality Improvement Program (AQIP).** The AQIP, established in 2007 by AB 118, is a voluntary incentive program administered by the CARB to fund clean vehicle and equipment projects, research on biofuels production, and the air quality impacts of alternative fuels, and workforce training.

4.3.2 Carbon Monoxide

The SDAB is classified as a state attainment area and as a federal maintenance area for carbon monoxide (County of San Diego 1998). Until 2003, no violations of the state standard for CO had been recorded in the SDAB since 1991, and no violations of the national standard had been recorded in the SDAB since 1989. Violations that took place in 2003 were likely the result of massive wildfires that occurred throughout the County. No violations of the state or federal CO standards have occurred since 2003. As shown in Tables 2 and 3, the state and national standards have not been exceeded at the San Diego–Union Street monitoring station and/or the SDAB during the five-year period from 2009 to 2013.

Small-scale, localized concentrations of CO above the state and national standards have the potential to occur at intersections with stagnation points such as those that occur on major highways and heavily traveled and congested roadways. Localized high concentrations of CO are referred to as “CO hot spots” and are a concern at congested intersections, where automobile engines burn fuel less efficiently and their exhaust contains more CO.

4.3.3 PM_{10}

PM_{10} is particulate matter with an aerodynamic diameter of 10 microns or less. Ten microns is about one-seventh the diameter of a human hair. Particulate matter is a complex mixture of very tiny solid or liquid particles composed of chemicals, soot, and dust. Sources of PM_{10} emissions in the SDAB consist mainly of urban activities, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere.

Under typical conditions (i.e., no wildfires) particles classified under the PM_{10} category are mainly emitted directly from activities that disturb the soil including travel on roads and construction, mining, or agricultural operations. Other sources include windblown dust, salts, brake dust, and tire wear (County of San Diego 1998). For several reasons hinging on the area’s dry climate and coastal location, the SDAB has special difficulty in developing adequate tactics to meet present state particulate standards.

The SDAB is designated as federal unclassified and state nonattainment for PM_{10}. The measured federal PM_{10} standard was exceeded once in 2007 and once in 2008 in the SDAB. The 2007 exceedance occurred on October 21, 2007, at a time when major wildfires were raging throughout the County. Consequently, this exceedance was likely caused by the wildfires and would be beyond the control of the SDAPCD. As such, this event is covered under the U.S. EPA’s Natural Events Policy that permits, under certain circumstances, the exclusion of air quality data attributable to uncontrollable natural events (e.g., volcanic activity, wild land fires, and high wind events). The 2008 exceedance did not occur during a wildfire and is not covered under this policy. The stricter state standard was exceeded a calculated number of 158.6 days in 2007, 163.4 days in 2008, 146.4 days in 2009, and 136.0 days in 2010. The state standard was also exceeded a measured 13 days in 2011, but there were insufficient data to estimate the calculated number of days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard, had measurements been collected every day. Particulate measurements are collected every six days.

At the San Diego–Overland Avenue monitoring station, the national 24-hour PM_{10} standard was not exceeded during the years 2007 through 2011. The stricter state 24-hour PM_{10} standard was exceeded a calculated 6.1 days in 2007, but was not exceeded in 2008 through 2011.

4.3.4 $PM_{2.5}$

Airborne, inhalable particles with aerodynamic diameters of 2.5 microns or less have been recognized as an air quality concern requiring regular monitoring. Federal regulations required that $PM_{2.5}$ monitoring begin January 1, 1999 (County of San Diego 1999). The San Diego–Overland Avenue monitoring station is one of seven stations in the SDAB that currently monitor $PM_{2.5}$. Federal $PM_{2.5}$ standards established in 1997 include an annual arithmetic mean of 15 $\mu g/m^3$ and a 24-hour concentration of 65 $\mu g/m^3$. As discussed above, the 24-hour $PM_{2.5}$ standard has been changed to 35 $\mu g/m^3$. However, this does not apply to the monitoring from 2004 to 2006. State $PM_{2.5}$ standards established in 2002 are an annual arithmetic mean of 12 $\mu g/m^3$. Table 3 shows that, from 2007 through 2011, neither the prior 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$ nor the new standard of 35 $\mu g/m^3$ was exceeded.

The SDAB was classified as an attainment area for the previous federal 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$ and has also been classified as an attainment area for the revised federal 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ (U.S. EPA 2004, 2009). The SDAB is a nonattainment area for the state $PM_{2.5}$ standard (State of California 2005b).

4.3.5 Other Criteria Pollutants

The national and state standards for NO_2, oxides of sulfur (SO_x), and previous standard for lead are being met in the SDAB, and the latest pollutant trends suggest that these standards will not be exceeded in the foreseeable future. As discussed above, new standards for these pollutants have been adopted, and new designations for the SDAB will be determined in the future. The SDAB is also in attainment of the state standards for hydrogen sulfide, sulfates, vinyl chloride, and visibility reducing particles.

5.0 Thresholds of Significance

5.1 City of San Diego

The City has adopted Significance Determination Thresholds for assessing potential air quality impacts under CEQA. The Project would have a significant air quality impact if it would (City of San Diego 2011):

For the purpose of this air quality assessment, a significant air quality impact would occur as a result of project implementation if the project:

1. Obstructs or conflicts with the implementation of the San Diego RAQS or applicable portions of the SIP.
2. Results in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation.
3. Results in a cumulatively considerable net increase of PM_{10} or exceeds quantitative thresholds for ozone precursors, oxides of nitrogen (NO_x), and volatile organic compounds (VOC).
4. Exposes sensitive receptors (including, but not limited to, schools, hospitals, residential care facilities, or day-care centers) to substantial pollutant concentrations, including air toxics such as diesel particulates.
5. Creates objectionable odors affecting a substantial number of people.

5.1.1 Emissions Criteria

Emissions resulting from implementation of the proposed Project would be due primarily to construction and traffic associated with daily operation. The SDAPCD does not provide specific numeric thresholds for determining the significance of air quality impacts under CEQA. However, the district does specify Air Quality Impact Analysis (AQIA) trigger levels for new or modified stationary sources (SDAPCD Rules 20.2 and 20.3). Although these trigger levels do not generally apply to mobile sources or general land development projects, for comparative purposes these levels are used to evaluate the increased emissions that would be discharged to the SDAB if the proposed Project were approved.

The SDAPCD thresholds are also utilized by the City in their Significance Determination Thresholds (City of San Diego 2011) as one of the considerations when determining the potential significance of air quality impacts for projects within the City. However, SDAPCD Rules 20.2 and 20.3 do not specify thresholds for reactive organic gases (ROG) or $PM_{2.5}$. The threshold for ROGs is based on the Environmental Protection Agency General Conformity Rule, which equates ROG and NO_X emissions under the Clean Air Act and applies the same limitation on ROG and NO_X emissions in ozone non-attainment areas (Federal Register 2010). The $PM_{2.5}$ threshold is equated to PM_{10} as the County is a federal $PM_{2.5}$ and PM_{10} attainment area. Furthermore, based on the SCAQMD's Final Methodology to Calculate $PM_{2.5}$ and $PM_{2.5}$ Significance Thresholds, PM_{10} exhaust is approximately 92 percent $PM_{2.5}$ and 61 percent of mechanical PM_{10} is $PM_{2.5}$ (SCAQMD 2006). The air quality thresholds used in this analysis are shown in Table 4.

TABLE 4
AIR QUALITY IMPACT SCREENING LEVELS

Pollutant	Emission Rate		
	(lb/hr)	(lb/day)	(tons/yr)
NO_X	25	250	40
SO_X	25	250	40
CO	100	550	100
PM_{10}	--	100	15
Lead	--	3.2	0.6
ROG[1]	--	250	--
$PM_{2.5}$[2]	--	100	--

SOURCE: SDAPCD Rule 20.2 (12/17/1998) except for VOC and $PM_{2.5}$.
ROG = reactive organic gases, CO = carbon monoxide, SO_x = oxides of sulfur, NO_x = oxides of nitrogen, PM_{10} = particulate matter less than 10 microns,
1 The threshold for ROG is based on the Environmental Protection Agency General Conformity Rule, which equates ROG and NO_X emissions under the clean air act and applies the same limitation on ROG and NO_X emissions in ozone non-attainment areas (Federal Register 2010).
2 $PM_{2.5}$ threshold equated to PM_{10} as the SDAPCD does not set a limit on $PM_{2.5}$ and approximately 92 percent of PM_{10} exhaust is $PM_{2.5}$ and 61 percent of mechanical PM_{10} is $PM_{2.5}$ (SCAQMD 2006).

In addition to a comparison with the quantitative thresholds for regional emissions in Table 4; the Project is evaluated for local air quality impacts, such as whether concentrations of carbon monoxide exceed the NAAQS or CAAQS; consistency with assumptions of the SDAPCD RAQS; and potential odor impacts. .

6.0 Air Quality Assessment

6.1 Construction-related Emissions

Construction-related activities are temporary, short-term sources of air emissions. Sources of construction-related air emissions include:

- Fugitive dust from grading activities;
- Construction equipment exhaust;
- Construction-related trips by workers, delivery trucks, and material-hauling trucks; and
- Construction-related power consumption.

6.1.1 Construction

Construction-related pollutants result from dust raised during demolition and grading, emissions from construction vehicles, and chemicals used during construction. Fugitive dust emissions vary greatly during construction and are dependent on the amount and type of activity, silt content of the soil, and the weather. Vehicles moving over paved and unpaved surfaces, demolition, excavation, earth movement, grading, and wind erosion from exposed surfaces are all sources of fugitive dust. Construction operations are subject to the requirements established in Regulation 4, Rules 52, 54, and 55, of the SDAPCD's rules and regulations.

Heavy-duty construction equipment is usually diesel powered. In general, emissions from diesel-powered equipment contain more nitrogen oxides, sulfur oxides, and particulate matter than gasoline-powered engines. However, diesel-powered engines generally produce less carbon monoxide and less reactive organic gases than do gasoline-powered engines. Standard construction equipment includes dozers, rollers, scrapers, dewatering pumps, backhoes, loaders, paving equipment, delivery/haul trucks, jacking equipment, welding machines, pile drivers, and so on.

Regardless of the alternative, the Project would take approximately 18 months to complete but is scheduled for a 2.5- to 3.5-year overall construction duration, as construction in and near sensitive areas is limited during the breeding season. Construction is anticipated to occur eight hours per day, Monday through Friday.

The construction schedule was evaluated to identify the period with the most overlapping activities as this represents the worst case for daily air emissions. Based on the schedule, the greatest potential for overlap would occur during the grading of the mitigation site and the grading of the west side of El Camino Real with the associated bridge work.

Construction equipment air emissions are anticipated to improve over time due to regulatory requirements affecting engine efficiency and fuel formulations. Thus in order to estimate the worst-case daily emissions and since the exact timing of construction is unknown, all construction activities were assumed to occur in the year 2015. This is conservative, as it compresses all activities to a single year and does not take into account any equipment improvements over the subsequent years. For air quality assessment purposes, the alternatives were consolidated into two scenarios since the construction equipment and schedules were similar for various alternatives. Scenario 1 includes the Central Alignment, Western Alignment, and the Lower Elevation alternatives, which are all considered to have similar construction schedules and requirements. Scenario 2 includes the Eastern Alignment and the Roundabout Alternative, which have similar construction schedules and construction requirements.

Total demolition associated with the roadway bed and existing bridge is estimated to result in approximately 4,380 cubic yards[1] of demolition debris. At an average of 20 cubic yard per truck load, approximately 219 truck trips would be required to haul away this material. For purposes of calculating emissions, it is estimated that it would require a maximum of 15 two-way truck trips per day with an average travel distance of 30 miles per a round trip.

For modeling purposes, the total area to be disturbed was estimated to be 24 acres during the grading of the mitigation site and roadway. As a conservative estimate, modeling included disturbance of the entire 24 acres daily. Additionally, as a worst-case analysis, each scenario was assumed to have a total net export/import of 51,600 cubic yards of fill and road base.

This analysis assumes that standard dust and emission control during grading operations would be implemented to reduce potential nuisance impacts and to ensure compliance with SDAPCD rules and regulations. It was assumed watering would take place two times per day. Additionally, all construction equipment was assumed to be compliant with state in-use off-road equipment regulations and was modeled as Tier II equipment. Tier II standards are met through advanced engine design and have been required for new off-road equipment over 50 horse power since 2008.

The following standard fugitive dust control measures required as part of grading are considered part of the project design and were taken into account for calculating construction emissions:

1. All unpaved construction areas shall be watered, or other acceptable SDAPCD dust control agents may be applied, two times per day to reduce dust emissions. Additional watering or acceptable SDAPCD dust control agents shall be applied during dry weather or windy days until dust emissions are not visible.

2. A 15-mile-per-hour speed limit on unpaved surfaces shall be enforced.

3. When visible, dirt and debris spilled onto paved surfaces shall be swept up immediately to reduce resuspension of particulate matter caused by vehicle movement. Approach routes to construction sites shall be cleaned daily of construction-related dirt.

4. Disturbed areas shall be hydroseeded, landscaped, or developed as quickly as possible and as directed by the City of San Diego and/or SDAPCD to reduce dust generation.

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[1] This estimate is based the 2,400 foot length of the project, a paved surface width of 23 feet, an average roadway bed depth of 2 feet, and a bridge deck of approximately 3 feet thick.

The contractor provided a list of construction equipment that would be used during each phase. Table 5 summarizes the construction equipment by construction phase. Some of the phases in Table 5, such as clearing and grubbing and grading of the mitigation site and roadway, were combined in order to create conservative scenarios for calculating maximum daily emissions. It was assumed that all equipment in a specific phase would operate simultaneously on any given day during the construction period.

TABLE 5
POTENTIAL CONSTRUCTION EQUIPMENT BY PHASE

Possible Equipment	Grading of Mitigation Site	Construct Trestle	Demo Existing Bridge	Drill Piles	Grading	Falsework	Construct Bridge Deck	Roadway Sub-base/ Utilities	Paving
Concrete Pumps				X			X		
Concrete Trucks				X		X	X		X
Dump Trucks	X		X					X	X
Wheeled Bulldozers			X		X			X	
Excavators				X					
Cranes		X	X	X		X	X		
Drill Rigs				X			X		
Welding Equipment		X	X	X		X	X		
Skiploaders		X	X		X	X	X	X	
Wheeled Front-end Loaders		X	X		X			X	X
Pile Drivers				X			X		
Ground Compactors	X				X			X	
Motor Graders	X				X			X	
Track Loaders	X				X				
Track Bulldozers	X				X				
Wheeled Tractor Scrapers	X				X				
Backhoe/Loaders			X			X			
Asphalt Pavers									X
Cold Planers									X
Flatbed Trucks		X	X			X	X	X	
Rollers								X	X

Tables 6 and 7 summarize the estimated criteria pollutant emissions due to construction activities. California Emissions Estimator Model (CalEEMod) input and output are provided in Attachments 1 and 2.

The emissions summarized in Tables 6 and 7 are the maximum daily emissions for all pollutants that may occur during each phase of construction. By overlapping various phases, these results represent a reasonable worst-case emissions scenario for purposes of assessing air quality impacts. For assessing the significance of the emissions generated during construction of the proposed Project, the construction emissions were compared to the City's thresholds, as identified in Table 4.

As seen in Tables 6 and 7, emissions would be less than the applicable thresholds for all criteria pollutants. Therefore the project would result in a less than significant impact.

TABLE 6
AVERAGE DAILY CONSTRUCTION EMISSIONS FOR THE CENTRAL ALIGNMENT, WESTERN ALIGNMENT, AND LOWER ELEVATION ALTERNATIVES
(pounds/day)

Pollutant	Construction Year: 2013	Threshold
ROG	9.2	250
NO_x	178.3	250
CO	140.4	550
SO_2	0.3	250
PM_{10}	14.7	100
$PM_{2.5}$	8.5	100

TABLE 7
AVERAGE DAILY CONSTRUCTION EMISSIONS FOR THE EASTERN ALIGNMENT AND THE ROUNDABOUT ALTERNATIVES
(pounds/day)

Pollutant	Construction Year: 2013	Threshold
ROG	6.6	250
NO_x	108.6	250
CO	88.4	550
SO_2	0.2	250
PM_{10}	14.9	100
$PM_{2.5}$	8.6	100

6.1.1.1 Mitigation

a. Central Alignment, Western Alignment, and Lower Elevation Alternatives

Table 6 shows the emissions would be less than significant with the incorporation of Tier II equipment and standard dust control measures, which are not considered mitigation. As no significant impact was identified, no mitigation is required.

b. Eastern Alignment and Roundabout Alternatives

Table 7 shows the emissions would be less than significant with the incorporation of Tier II equipment and standard dust control measures, which are not considered mitigation. As no significant impact was identified, no mitigation is required.

6.1.2 Fugitive Dust Nuisance Impacts

Fugitive dust is any solid particulate matter that becomes airborne directly or indirectly as a result of the activities of man or natural events (such as windborne dust), other than that emitted from an exhaust stack. Construction dust is composed primarily of chemically inert particles that are too large to enter the human respiratory tract when inhaled. Fugitive dust emissions vary greatly during construction and are dependent on the amount and type of activity, silt content of the soil, and the weather. Vehicles moving over paved and unpaved surfaces, demolition, excavation, earth movement, grading, and wind erosion from exposed surfaces are all sources of fugitive dust.

Fugitive dust emissions could be perceived as a nuisance to the immediate area. As required by Regulation 4, Rules 52, 54, and 55, of the SDAPCD's rules and regulations, dust control during demolition and grading operations would be implemented to reduce potential nuisance impacts to below a level of significance.

6.2 Operation-related Emissions

6.2.1 Mobile and Area Source Emissions

The Project proposes the widening of El Camino Real from two to four lanes and to replace the existing bridge with a new bridge. The Project also proposes to widen Via de la Valle easterly from El Camino Real to El Camino Real North. A traffic analysis was prepared to determine any traffic-related impacts within the study area to roadways and intersections due to all build alternatives (Urban System Associates, Inc. 2012). Based on the traffic report future traffic volumes would be the same for all alternatives. As implementation of the Project would not result in an increase in mobile source air emissions, air quality impacts from Project operations would be less than significant.

6.2.2 Localized Carbon Monoxide Impacts

Small-scale, localized concentrations of CO above the state and national standards have the potential to occur near congested intersections. Localized, high concentrations of CO are referred to as "CO hot spots." Appropriate procedures and guidelines to determine whether a project poses the potential for a CO hot spot are contained in *Transportation Project-Level Carbon Monoxide Protocol* (CO Protocol) (U.C. Davis Institute of Transportation Studies 1997). According to the CO Protocol, projects may worsen air quality if they increase the percentage of vehicles in cold start modes by 2 percent or more, significantly increase traffic volumes over existing volumes or worsen traffic flow. The CO Protocol defines a significant increase in traffic as an increase in average daily traffic (ADT) from all roadways of 5 percent or more. Worsening traffic flow is defined for signalized intersections as increasing average delay at intersections operating at Level of Service (LOS) E or F or causing an intersection that would operate at LOS D or better without the project, to operate at LOS E or F. Unsignalized intersections are not considered as potential candidates for CO hot spots as traffic volumes are typically lower at un-signalized intersections and vehicles do not have the duration of idling associated with signalized intersections; further, un-signalized intersections are typically signalized when the traffic volumes increase and significant delays in traffic are identified.

Urban Systems Associates prepared a project traffic analysis, which analyzed the traffic impacts related to the project (Urban Systems Associates, Inc. 2012). The intersection analysis for the existing and existing plus project is summarized in Table 8 and the cumulative and cumulative plus project intersection operation analysis is summarized in Table 9. The Roundabout Alternative is not included in Tables 8 or 9 due to the difference in operational characteristics; however, based on Chapter 8 of the traffic analysis, the Roundabout Alternative would result in LOS B or better operations under future 2035 conditions, with the exception of an interim design configuration, which would operate at LOS E in the AM and LOS F in the PM. While this interim condition continues to operate at an unacceptable LOS under both peak periods, the AM period delay would be reduced by 155 seconds and the PM period delay would be reduced by 57.9 seconds. Therefore, even under the interim roundabout intersection design, the project would result in more efficient intersection operations.

Based on the intersection operation improvements associated with the project, the traffic analysis shows that all signalized intersections analyzed for the proposed project would operate at LOS D or better under year 2035 cumulative plus project conditions. Therefore, project-generated local mobile-source CO emissions would not result in or substantially contribute to concentrations that exceed the 1-hour or 8-hour ambient air quality standards for CO.

TABLE 8
EXISTING AND EXISTING PLUS PROJECT INTERSECTION OPERATIONS

	Existing AM Peak		Existing PM Peak		Existing + Project AM Peak		Existing + Project PM Peak	
Intersection	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Via de la Valle and El Camino Real	D	46.9	D	39.9	C	22.9	C	24.3
Via de la Valle and N. El Camino Real	B	12.1	B	11.3	B	11.4	B	15.3
Polo Grounds Entrance and El Camino Real	D	28.8	**F**	**53.6**	B	10.4	B	15.8
San Dieguito Road and El Camino Real	A	14.6	C	20.3	B	12.9	B	14.2
San Dieguito Road and Old El Camino Real	D	26.2	C	24.1	C	16.8	C	18.5

Bold indicates inacceptable level of service.

TABLE 9
YEAR 2035 – CUMULATIVE AND CUMULATIVE PLUS PROJECT INTERSECTION OPERATIONS

Intersection	Cumulative AM Peak		Cumulative PM Peak		Cumulative + Project AM Peak		Cumulative + Project PM Peak	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Via de la Valle and El Camino Real	**F**	**192**	**F**	**262.1**	D	37.1	D	48.7
Via de la Valle and N. El Camino Real	**F**	**90.8**	**F**	**103.4**	C	24.9	D	35.4
Polo Grounds Entrance and El Camino Real	**F**	**209.2**	**F**	**>210**	A	9.6	C	22.9
San Dieguito Road and El Camino Real	C	22.3	D	46	B	19.6	C	20.1
San Dieguito Road and Old El Camino Real	**F**	**53**	**F**	88.6	C	22.3	D	30.8

Bold indicates inacceptable level of service

6.3 Conformance with Regional Plans and City Criteria

1. *Would the proposed project obstruct or conflict with the implementation of the San Diego RAQS or applicable portions of the SIP?*

   The RAQS and TCM plan developed by the SDAPCD and SANDAG set forth the steps needed to accomplish attainment of state AAQS. The SIP contains the state strategy for attainment of the NAAQS. The basis for these plans is the distribution of population in the region as projected by SANDAG. Growth forecasting is based in part on the land uses established by the San Diego General Plan. This Project would consist of widening segments of El Camino Real and Via de la Valle, and replacing the bridge on El Camino Real, which is consistent with the general plan designation. As such, the proposed Project would not conflict with the implementation of the local air quality plan. The proposed Project is also a phased arterial project considered in the 2050 Regional Transportation Plan (SANDAG 2011).

   Additionally, the proposed Project is a roadway improvement project intended to facilitate the flow of traffic forecast for the region. As previously mentioned, the proposed Project is also a phased arterial project considered in the 2050 Regional Transportation Plan (RTP), and operational impacts from the new roadway would be in conformance with this plan. Impacts would be less than significant.

2. *Would the proposed Plan result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation?*

The region is currently in nonattainment for the federal and state ozone standards. However, Project construction would not result in emissions in excess of the City's air quality emissions thresholds; therefore, air quality emissions during construction would be less than significant.

Long-term emissions of air pollutants occur from operational sources. Vehicle travel would generate mobile source emissions including CO, nitrogen oxides, and hydrocarbons.

As discussed above, this Project would consist of widening segments of El Camino Real and Via de la Valle, and replacing the bridge on El Camino Real. The Project does not include any new uses, such as machinery that could result in stationary source emissions. No new mobile source emissions would be attributed to the proposed roadway improvements. Operational impacts would be less than significant.

3. *Would the proposed plan result in a cumulatively considerable net increase of PM_{10}, $PM_{2.5}$, or exceeds quantitative thresholds for ozone precursors, oxides of nitrogen (NO_x), and volatile organic compounds?*

The region is classified as attainment for all criterion pollutants except ozone, PM_{10}, and $PM_{2.5}$. The SDAB is non-attainment for the 8-hour federal and state ozone standards. Ozone is not emitted directly, but is a result of atmospheric activity on precursors. Nitrogen oxides and hydrocarbons (ROGs) are known as the chief "precursors" of ozone. These compounds react in the presence of sunlight to produce ozone.

As described, no new mobile source emissions would be associated with the roadway improvements. Construction-related emissions would be less than established significance thresholds for each criteria pollutant. Therefore, impacts would be less than significant.

4. *Would the proposed Plan expose sensitive receptors (including, but not limited to, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations, including air toxics such as diesel particulates?*

Based on the intersection operation improvements associated with the project, all signalized intersections analyzed for the proposed project would operate at LOS D or better under existing plus project and year 2035 cumulative plus project conditions. Therefore, project-generated local mobile-source CO emissions would not result in or substantially contribute to concentrations that exceed the 1-hour or 8-hour ambient air quality standards for CO. Additionally, no new mobile source emissions would be associated with the roadway improvements. Project construction would result in some construction-related emissions; however, these emissions would be short term and temporary in nature. Exposure to substantial toxic emissions is not anticipated. Impacts would be less than significant.

5. *Would the proposed Plan create objectionable odors affecting a substantial number of people?*

   The Project does not include any land uses typically associated with odor complaints. During construction, diesel equipment may generate some nuisance odors; however, due to the distance of sensitive receptors from the Project site, odors associated with Project construction would not be significant.

7.0 Conclusions and Recommendations

Maximum daily construction emissions under all alternatives are not projected to exceed the City's air quality emissions thresholds. All other emissions are projected to be less than the applicable thresholds.

No new mobile source emissions would be associated with the roadway improvements.

The results of the hot spot analysis are below applicable standards and therefore would be less than significant.

As mentioned in Section 6.3, the proposed Project conforms to the regional plans including the RAQS, the TCM, and the RTP. Regardless of this conformance, air quality impacts during construction of the proposed Project would be temporarily significant.

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ATTACHMENTS

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ATTACHMENT 1

Central, Western, and Lower Elevation—CalEEMod Input/Output

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Annual

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San Diego County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	4.00	Acre	4.00	0.00	0
Other Non-Asphalt Surfaces	24.00	Acre	24.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2015
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - No structure is proposed

Construction Phase - per contractor

Off-road Equipment - per contractor

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - per contractor

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Per Engineer

Off-road Equipment -

Trips and VMT - Worker trip estimate

Demolition -

Grading - Based on project area

Vechicle Emission Factors -

Vechicle Emission Factors -

Vechicle Emission Factors -

Water And Wastewater -

Construction Off-road Equipment Mitigation - Regulatory Requirements

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	34.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00

tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	30.00	5.00
tblConstructionPhase	NumDays	45.00	5.00
tblConstructionPhase	NumDays	45.00	5.00
tblConstructionPhase	NumDays	45.00	15.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	PhaseEndDate	3/18/2015	4/22/2015
tblConstructionPhase	PhaseStartDate	3/12/2015	4/16/2015
tblGrading	AcresOfGrading	12.50	24.00
tblGrading	AcresOfGrading	12.50	2.00
tblGrading	AcresOfGrading	37.50	2.00
tblGrading	MaterialImported	0.00	7,850.00
tblGrading	MaterialImported	0.00	7,850.00
tblLandUse	LandUseSquareFeet	174,240.00	0.00
tblLandUse	LandUseSquareFeet	1,045,440.00	0.00
tblOffRoadEquipment	HorsePower	162.00	157.00
tblOffRoadEquipment	HorsePower	400.00	381.00
tblOffRoadEquipment	HorsePower	171.00	327.00
tblOffRoadEquipment	HorsePower	255.00	358.00
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.42	0.62
tblOffRoadEquipment	LoadFactor	0.40	0.59

tblProjectCharacteristics	OperationalYear	2014	2015
tblTripsAndVMT	VendorTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	100.00
tblTripsAndVMT	VendorTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	100.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.2595	2.7255	1.9953	3.2000e-003	0.2381	0.1229	0.3610	0.0885	0.1140	0.2024	0.0000	296.9821	296.9821	0.0467	0.0000	297.9631
Total	**0.2595**	**2.7255**	**1.9953**	**3.2000e-003**	**0.2381**	**0.1229**	**0.3610**	**0.0885**	**0.1140**	**0.2024**	**0.0000**	**296.9821**	**296.9821**	**0.0467**	**0.0000**	**297.9631**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.1156	2.0893	1.7225	3.2000e-003	0.1294	0.0538	0.1833	0.0460	0.0530	0.0990	0.0000	296.9819	296.9819	0.0467	0.0000	297.9629
Total	**0.1156**	**2.0893**	**1.7225**	**3.2000e-003**	**0.1294**	**0.0538**	**0.1833**	**0.0460**	**0.0530**	**0.0990**	**0.0000**	**296.9819**	**296.9819**	**0.0467**	**0.0000**	**297.9629**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**55.45**	**23.34**	**13.68**	**0.00**	**45.64**	**56.18**	**49.23**	**48.02**	**53.47**	**51.09**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0000e-005**	**0.0000**	**2.7000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**0.0000**	**5.3000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0000e-005**	**0.0000**	**2.7000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**0.0000**	**5.3000e-004**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grubbing/Clearing	Site Preparation	1/1/2015	1/7/2015	5	5	Site Preparation
2	Grading of mitigation site	Grading	1/8/2015	1/14/2015	5	5	
3	Grading roadway work West Side	Grading	1/15/2015	1/21/2015	5	5	
4	Utilities and Sub-grade	Trenching	1/22/2015	1/28/2015	5	5	
5	Demolition	Demolition	1/29/2015	2/4/2015	5	5	
6	Grading roadway work East Side	Grading	2/5/2015	2/25/2015	5	15	
7	Construct Trestle	Building Construction	2/26/2015	3/4/2015	5	5	
8	Column R/F/P	Building Construction	3/5/2015	3/11/2015	5	5	
9	Falsework	Building Construction	4/16/2015	4/22/2015	5	5	
10	Stem & Sofit RFP	Building Construction	4/23/2015	4/29/2015	5	5	
11	Deck R/F/P	Building Construction	4/30/2015	5/6/2015	5	5	
12	Post-tension Bridge	Building Construction	5/7/2015	5/13/2015	5	5	
13	Remove Falsework	Building Construction	5/14/2015	5/20/2015	5	5	
14	Remove Trestle	Building Construction	5/21/2015	5/27/2015	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grubbing/Clearing	Rubber Tired Dozers	3	8.00	255	0.40
Grubbing/Clearing	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading of mitigation site	Excavators	2	8.00	162	0.38
Grading of mitigation site	Graders	1	8.00	174	0.41

Grading of mitigation site	Rubber Tired Dozers	1	8.00	255	0.40
Grading of mitigation site	Scrapers	2	8.00	361	0.48
Grading of mitigation site	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading roadway work West Side	Excavators	2	8.00	162	0.38
Grading roadway work West Side	Graders	1	8.00	174	0.41
Grading roadway work West Side	Rubber Tired Dozers	1	8.00	255	0.40
Grading roadway work West Side	Scrapers	2	8.00	361	0.48
Grading roadway work West Side	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Grading roadway work East Side	Excavators	2	8.00	162	0.38
Grading roadway work East Side	Graders	1	8.00	174	0.41
Grading roadway work East Side	Rubber Tired Dozers	1	8.00	255	0.40
Grading roadway work East Side	Scrapers	2	8.00	361	0.48
Grading roadway work East Side	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Construct Trestle	Cranes	1	7.00	226	0.29
Construct Trestle	Forklifts	3	8.00	89	0.20
Construct Trestle	Generator Sets	1	8.00	84	0.74
Construct Trestle	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Construct Trestle	Welders	1	8.00	46	0.45
Column R/F/P	Bore/Drill Rigs	0		205	0.50
Column R/F/P	Cranes	1	7.00	226	0.29
Column R/F/P	Forklifts	3	8.00	89	0.20
Column R/F/P	Generator Sets	1	8.00	84	0.74
Column R/F/P	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Column R/F/P	Welders	1	8.00	46	0.45
Falsework	Cranes	1	7.00	226	0.29

Falsework	Forklifts	3	8.00	89	0.20
Falsework	Generator Sets	1	8.00	84	0.74
Falsework	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Falsework	Welders	1	8.00	46	0.45
Stem & Sofit RFP	Cranes	1	7.00	226	0.29
Stem & Sofit RFP	Excavators	1	8.00	157	0.57
Stem & Sofit RFP	Forklifts	3	8.00	89	0.20
Stem & Sofit RFP	Generator Sets	1	8.00	84	0.74
Stem & Sofit RFP	Off-Highway Trucks	2	8.00	381	0.57
Stem & Sofit RFP	Other Construction Equipment	1	8.00	327	0.62
Stem & Sofit RFP	Rubber Tired Dozers	1	8.00	358	0.59
Stem & Sofit RFP	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Stem & Sofit RFP	Welders	1	8.00	46	0.45
Deck R/F/P	Cranes	1	7.00	226	0.29
Deck R/F/P	Forklifts	3	8.00	89	0.20
Deck R/F/P	Generator Sets	1	8.00	84	0.74
Deck R/F/P	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Deck R/F/P	Welders	1	8.00	46	0.45
Post-tension Bridge	Cranes	1	7.00	226	0.29
Post-tension Bridge	Forklifts	3	8.00	89	0.20
Post-tension Bridge	Generator Sets	1	8.00	84	0.74
Post-tension Bridge	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Post-tension Bridge	Welders	1	8.00	46	0.45
Remove Falsework	Cranes	1	7.00	226	0.29
Remove Falsework	Forklifts	3	8.00	89	0.20
Remove Falsework	Generator Sets	1	8.00	84	0.74
Remove Falsework	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Remove Falsework	Welders	1	8.00	46	0.45

Remove Trestle	Cranes	1	7.00	226	0.29
Remove Trestle	Forklifts	3	8.00	89	0.20
Remove Trestle	Generator Sets	1	8.00	84	0.74
Remove Trestle	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Remove Trestle	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grubbing/Clearing	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading of mitigation site	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading roadway work West Side	8	20.00	0.00	981.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Utilities and Sub-grade				0.00	10.80	7.30				
Demolition	6	15.00	0.00	559.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading roadway work East Side	8	20.00	0.00	981.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Construct Trestle	9	15.00	100.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Column R/F/P	9	38.00	200.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Falsework	9	15.00	100.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Stem & Sofit RFP	14	38.00	200.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Deck R/F/P	9	15.00	200.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Post-tension Bridge	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Falsework	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Trestle	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Grubbing/Clearing - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0132	0.1422	0.1066	1.0000e-004		7.7200e-003	7.7200e-003		7.1000e-003	7.1000e-003	0.0000	9.3253	9.3253	2.7800e-003	0.0000	9.3837
Total	**0.0132**	**0.1422**	**0.1066**	**1.0000e-004**	**0.0452**	**7.7200e-003**	**0.0529**	**0.0248**	**7.1000e-003**	**0.0319**	**0.0000**	**9.3253**	**9.3253**	**2.7800e-003**	**0.0000**	**9.3837**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-004	2.2000e-004	2.1500e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3485	0.3485	2.0000e-005	0.0000	0.3489
Total	**1.7000e-004**	**2.2000e-004**	**2.1500e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3485**	**0.3485**	**2.0000e-005**	**0.0000**	**0.3489**

3.2 Grubbing/Clearing - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0203	0.0000	0.0203	0.0112	0.0000	0.0112	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.0700e-003	0.0861	0.0585	1.0000e-004		2.4000e-003	2.4000e-003		2.4000e-003	2.4000e-003	0.0000	9.3253	9.3253	2.7800e-003	0.0000	9.3837
Total	**3.0700e-003**	**0.0861**	**0.0585**	**1.0000e-004**	**0.0203**	**2.4000e-003**	**0.0227**	**0.0112**	**2.4000e-003**	**0.0136**	**0.0000**	**9.3253**	**9.3253**	**2.7800e-003**	**0.0000**	**9.3837**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-004	2.2000e-004	2.1500e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3485	0.3485	2.0000e-005	0.0000	0.3489
Total	**1.7000e-004**	**2.2000e-004**	**2.1500e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3485**	**0.3485**	**2.0000e-005**	**0.0000**	**0.3489**

3.3 Grading of mitigation site - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0278	0.0000	0.0278	9.6500e-003	0.0000	9.6500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0169	0.1976	0.1271	1.5000e-004		9.5100e-003	9.5100e-003		8.7500e-003	8.7500e-003	0.0000	14.7106	14.7106	4.3900e-003	0.0000	14.8028
Total	**0.0169**	**0.1976**	**0.1271**	**1.5000e-004**	**0.0278**	**9.5100e-003**	**0.0373**	**9.6500e-003**	**8.7500e-003**	**0.0184**	**0.0000**	**14.7106**	**14.7106**	**4.3900e-003**	**0.0000**	**14.8028**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.5000e-004	2.3900e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3872	0.3872	2.0000e-005	0.0000	0.3877
Total	**1.9000e-004**	**2.5000e-004**	**2.3900e-003**	**0.0000**	**4.0000e-004**	**0.0000**	**4.0000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3872**	**0.3872**	**2.0000e-005**	**0.0000**	**0.3877**

3.3 Grading of mitigation site - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0125	0.0000	0.0125	4.3400e-003	0.0000	4.3400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.7300e-003	0.1274	0.0949	1.5000e-004		3.4500e-003	3.4500e-003		3.4500e-003	3.4500e-003	0.0000	14.7105	14.7105	4.3900e-003	0.0000	14.8028
Total	**4.7300e-003**	**0.1274**	**0.0949**	**1.5000e-004**	**0.0125**	**3.4500e-003**	**0.0160**	**4.3400e-003**	**3.4500e-003**	**7.7900e-003**	**0.0000**	**14.7105**	**14.7105**	**4.3900e-003**	**0.0000**	**14.8028**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.5000e-004	2.3900e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3872	0.3872	2.0000e-005	0.0000	0.3877
Total	**1.9000e-004**	**2.5000e-004**	**2.3900e-003**	**0.0000**	**4.0000e-004**	**0.0000**	**4.0000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3872**	**0.3872**	**2.0000e-005**	**0.0000**	**0.3877**

3.4 Grading roadway work West Side - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0167	0.0000	0.0167	8.4700e-003	0.0000	8.4700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0169	0.1976	0.1271	1.5000e-004		9.5100e-003	9.5100e-003		8.7500e-003	8.7500e-003	0.0000	14.7106	14.7106	4.3900e-003	0.0000	14.8028
Total	**0.0169**	**0.1976**	**0.1271**	**1.5000e-004**	**0.0167**	**9.5100e-003**	**0.0262**	**8.4700e-003**	**8.7500e-003**	**0.0172**	**0.0000**	**14.7106**	**14.7106**	**4.3900e-003**	**0.0000**	**14.8028**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0118	0.1660	0.1272	3.7000e-004	8.3700e-003	2.4900e-003	0.0109	2.3000e-003	2.2900e-003	4.5900e-003	0.0000	33.9067	33.9067	2.8000e-004	0.0000	33.9125
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.5000e-004	2.3900e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3872	0.3872	2.0000e-005	0.0000	0.3877
Total	**0.0120**	**0.1663**	**0.1296**	**3.7000e-004**	**8.7700e-003**	**2.4900e-003**	**0.0113**	**2.4100e-003**	**2.2900e-003**	**4.7000e-003**	**0.0000**	**34.2939**	**34.2939**	**3.0000e-004**	**0.0000**	**34.3001**

3.4 Grading roadway work West Side - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.5000e-003	0.0000	7.5000e-003	3.8100e-003	0.0000	3.8100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.7300e-003	0.1274	0.0949	1.5000e-004		3.4500e-003	3.4500e-003		3.4500e-003	3.4500e-003	0.0000	14.7105	14.7105	4.3900e-003	0.0000	14.8028
Total	**4.7300e-003**	**0.1274**	**0.0949**	**1.5000e-004**	**7.5000e-003**	**3.4500e-003**	**0.0110**	**3.8100e-003**	**3.4500e-003**	**7.2600e-003**	**0.0000**	**14.7105**	**14.7105**	**4.3900e-003**	**0.0000**	**14.8028**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0118	0.1660	0.1272	3.7000e-004	8.3700e-003	2.4900e-003	0.0109	2.3000e-003	2.2900e-003	4.5900e-003	0.0000	33.9067	33.9067	2.8000e-004	0.0000	33.9125
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.5000e-004	2.3900e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3872	0.3872	2.0000e-005	0.0000	0.3877
Total	**0.0120**	**0.1663**	**0.1296**	**3.7000e-004**	**8.7700e-003**	**2.4900e-003**	**0.0113**	**2.4100e-003**	**2.2900e-003**	**4.7000e-003**	**0.0000**	**34.2939**	**34.2939**	**3.0000e-004**	**0.0000**	**34.3001**

3.5 Utilities and Sub-grade - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0612	0.0000	0.0612	9.2700e-003	0.0000	9.2700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0113	0.1209	0.0902	1.0000e-004		6.1300e-003	6.1300e-003		5.7100e-003	5.7100e-003	0.0000	9.3603	9.3603	2.5400e-003	0.0000	9.4136
Total	**0.0113**	**0.1209**	**0.0902**	**1.0000e-004**	**0.0612**	**6.1300e-003**	**0.0673**	**9.2700e-003**	**5.7100e-003**	**0.0150**	**0.0000**	**9.3603**	**9.3603**	**2.5400e-003**	**0.0000**	**9.4136**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.7100e-003	0.0946	0.0725	2.1000e-004	4.7700e-003	1.4200e-003	6.1900e-003	1.3100e-003	1.3100e-003	2.6100e-003	0.0000	19.3209	19.3209	1.6000e-004	0.0000	19.3242
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**6.8500e-003**	**0.0948**	**0.0743**	**2.1000e-004**	**5.0700e-003**	**1.4200e-003**	**6.4900e-003**	**1.3900e-003**	**1.3100e-003**	**2.6900e-003**	**0.0000**	**19.6113**	**19.6113**	**1.8000e-004**	**0.0000**	**19.6150**

3.6 Demolition - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0275	0.0000	0.0275	4.1700e-003	0.0000	4.1700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2300e-003	0.0837	0.0632	1.0000e-004		2.3300e-003	2.3300e-003		2.3300e-003	2.3300e-003	0.0000	9.3603	9.3603	2.5400e-003	0.0000	9.4136
Total	**3.2300e-003**	**0.0837**	**0.0632**	**1.0000e-004**	**0.0275**	**2.3300e-003**	**0.0299**	**4.1700e-003**	**2.3300e-003**	**6.5000e-003**	**0.0000**	**9.3603**	**9.3603**	**2.5400e-003**	**0.0000**	**9.4136**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.7100e-003	0.0946	0.0725	2.1000e-004	4.7700e-003	1.4200e-003	6.1900e-003	1.3100e-003	1.3100e-003	2.6100e-003	0.0000	19.3209	19.3209	1.6000e-004	0.0000	19.3242
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**6.8500e-003**	**0.0948**	**0.0743**	**2.1000e-004**	**5.0700e-003**	**1.4200e-003**	**6.4900e-003**	**1.3900e-003**	**1.3100e-003**	**2.6900e-003**	**0.0000**	**19.6113**	**19.6113**	**1.8000e-004**	**0.0000**	**19.6150**

3.7 Grading roadway work East Side - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0468	0.0000	0.0468	0.0250	0.0000	0.0250	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5929	0.3813	4.6000e-004		0.0285	0.0285		0.0262	0.0262	0.0000	44.1317	44.1317	0.0132	0.0000	44.4083
Total	**0.0508**	**0.5929**	**0.3813**	**4.6000e-004**	**0.0468**	**0.0285**	**0.0753**	**0.0250**	**0.0262**	**0.0513**	**0.0000**	**44.1317**	**44.1317**	**0.0132**	**0.0000**	**44.4083**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0118	0.1660	0.1272	3.7000e-004	8.3700e-003	2.4900e-003	0.0109	2.3000e-003	2.2900e-003	4.5900e-003	0.0000	33.9067	33.9067	2.8000e-004	0.0000	33.9125
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.7000e-004	7.5000e-004	7.1800e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.1616	1.1616	6.0000e-005	0.0000	1.1630
Total	**0.0124**	**0.1668**	**0.1343**	**3.8000e-004**	**9.5700e-003**	**2.5000e-003**	**0.0121**	**2.6200e-003**	**2.3000e-003**	**4.9200e-003**	**0.0000**	**35.0683**	**35.0683**	**3.4000e-004**	**0.0000**	**35.0754**

3.7 Grading roadway work East Side - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0211	0.0000	0.0211	0.0113	0.0000	0.0113	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0142	0.3821	0.2846	4.6000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	44.1316	44.1316	0.0132	0.0000	44.4083
Total	**0.0142**	**0.3821**	**0.2846**	**4.6000e-004**	**0.0211**	**0.0103**	**0.0314**	**0.0113**	**0.0103**	**0.0216**	**0.0000**	**44.1316**	**44.1316**	**0.0132**	**0.0000**	**44.4083**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0118	0.1660	0.1272	3.7000e-004	8.3700e-003	2.4900e-003	0.0109	2.3000e-003	2.2900e-003	4.5900e-003	0.0000	33.9067	33.9067	2.8000e-004	0.0000	33.9125
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.7000e-004	7.5000e-004	7.1800e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.1616	1.1616	6.0000e-005	0.0000	1.1630
Total	**0.0124**	**0.1668**	**0.1343**	**3.8000e-004**	**9.5700e-003**	**2.5000e-003**	**0.0121**	**2.6200e-003**	**2.3000e-003**	**4.9200e-003**	**0.0000**	**35.0683**	**35.0683**	**3.4000e-004**	**0.0000**	**35.0754**

3.8 Construct Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0751	0.0469	7.0000e-005		5.2900e-003	5.2900e-003		4.9800e-003	4.9800e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**9.1500e-003**	**0.0751**	**0.0469**	**7.0000e-005**		**5.2900e-003**	**5.2900e-003**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.2200e-003	0.0281	0.0370	6.0000e-005	1.6300e-003	4.5000e-004	2.0800e-003	4.7000e-004	4.1000e-004	8.8000e-004	0.0000	5.4580	5.4580	5.0000e-005	0.0000	5.4590
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**3.3600e-003**	**0.0283**	**0.0388**	**6.0000e-005**	**1.9300e-003**	**4.5000e-004**	**2.3800e-003**	**5.5000e-004**	**4.1000e-004**	**9.6000e-004**	**0.0000**	**5.7484**	**5.7484**	**7.0000e-005**	**0.0000**	**5.7498**

3.8 Construct Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-003	0.0587	0.0445	7.0000e-005		2.2500e-003	2.2500e-003		2.2500e-003	2.2500e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**2.7000e-003**	**0.0587**	**0.0445**	**7.0000e-005**		**2.2500e-003**	**2.2500e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.2200e-003	0.0281	0.0370	6.0000e-005	1.6300e-003	4.5000e-004	2.0800e-003	4.7000e-004	4.1000e-004	8.8000e-004	0.0000	5.4580	5.4580	5.0000e-005	0.0000	5.4590
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**3.3600e-003**	**0.0283**	**0.0388**	**6.0000e-005**	**1.9300e-003**	**4.5000e-004**	**2.3800e-003**	**5.5000e-004**	**4.1000e-004**	**9.6000e-004**	**0.0000**	**5.7484**	**5.7484**	**7.0000e-005**	**0.0000**	**5.7498**

3.9 Column R/F/P - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0751	0.0469	7.0000e-005		5.2900e-003	5.2900e-003		4.9800e-003	4.9800e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**9.1500e-003**	**0.0751**	**0.0469**	**7.0000e-005**		**5.2900e-003**	**5.2900e-003**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4400e-003	0.0563	0.0740	1.2000e-004	3.2500e-003	9.0000e-004	4.1500e-003	9.3000e-004	8.3000e-004	1.7600e-003	0.0000	10.9160	10.9160	1.0000e-004	0.0000	10.9180
Worker	3.6000e-004	4.7000e-004	4.5500e-003	1.0000e-005	7.6000e-004	1.0000e-005	7.7000e-004	2.0000e-004	1.0000e-005	2.1000e-004	0.0000	0.7357	0.7357	4.0000e-005	0.0000	0.7366
Total	**6.8000e-003**	**0.0567**	**0.0785**	**1.3000e-004**	**4.0100e-003**	**9.1000e-004**	**4.9200e-003**	**1.1300e-003**	**8.4000e-004**	**1.9700e-003**	**0.0000**	**11.6517**	**11.6517**	**1.4000e-004**	**0.0000**	**11.6546**

3.9 Column R/F/P - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-003	0.0587	0.0445	7.0000e-005		2.2500e-003	2.2500e-003		2.2500e-003	2.2500e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**2.7000e-003**	**0.0587**	**0.0445**	**7.0000e-005**		**2.2500e-003**	**2.2500e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4400e-003	0.0563	0.0740	1.2000e-004	3.2500e-003	9.0000e-004	4.1500e-003	9.3000e-004	8.3000e-004	1.7600e-003	0.0000	10.9160	10.9160	1.0000e-004	0.0000	10.9180
Worker	3.6000e-004	4.7000e-004	4.5500e-003	1.0000e-005	7.6000e-004	1.0000e-005	7.7000e-004	2.0000e-004	1.0000e-005	2.1000e-004	0.0000	0.7357	0.7357	4.0000e-005	0.0000	0.7366
Total	**6.8000e-003**	**0.0567**	**0.0785**	**1.3000e-004**	**4.0100e-003**	**9.1000e-004**	**4.9200e-003**	**1.1300e-003**	**8.4000e-004**	**1.9700e-003**	**0.0000**	**11.6517**	**11.6517**	**1.4000e-004**	**0.0000**	**11.6546**

3.10 Falsework - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0751	0.0469	7.0000e-005		5.2900e-003	5.2900e-003		4.9800e-003	4.9800e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**9.1500e-003**	**0.0751**	**0.0469**	**7.0000e-005**		**5.2900e-003**	**5.2900e-003**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.2200e-003	0.0281	0.0370	6.0000e-005	1.6300e-003	4.5000e-004	2.0800e-003	4.7000e-004	4.1000e-004	8.8000e-004	0.0000	5.4580	5.4580	5.0000e-005	0.0000	5.4590
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**3.3600e-003**	**0.0283**	**0.0388**	**6.0000e-005**	**1.9300e-003**	**4.5000e-004**	**2.3800e-003**	**5.5000e-004**	**4.1000e-004**	**9.6000e-004**	**0.0000**	**5.7484**	**5.7484**	**7.0000e-005**	**0.0000**	**5.7498**

3.10 Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-003	0.0587	0.0445	7.0000e-005		2.2500e-003	2.2500e-003		2.2500e-003	2.2500e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**2.7000e-003**	**0.0587**	**0.0445**	**7.0000e-005**		**2.2500e-003**	**2.2500e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.2200e-003	0.0281	0.0370	6.0000e-005	1.6300e-003	4.5000e-004	2.0800e-003	4.7000e-004	4.1000e-004	8.8000e-004	0.0000	5.4580	5.4580	5.0000e-005	0.0000	5.4590
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**3.3600e-003**	**0.0283**	**0.0388**	**6.0000e-005**	**1.9300e-003**	**4.5000e-004**	**2.3800e-003**	**5.5000e-004**	**4.1000e-004**	**9.6000e-004**	**0.0000**	**5.7484**	**5.7484**	**7.0000e-005**	**0.0000**	**5.7498**

3.11 Stem & Sofit RFP - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0275	0.2934	0.1767	2.7000e-004		0.0144	0.0144		0.0134	0.0134	0.0000	25.4577	25.4577	7.3100e-003	0.0000	25.6112
Total	**0.0275**	**0.2934**	**0.1767**	**2.7000e-004**		**0.0144**	**0.0144**		**0.0134**	**0.0134**	**0.0000**	**25.4577**	**25.4577**	**7.3100e-003**	**0.0000**	**25.6112**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4400e-003	0.0563	0.0740	1.2000e-004	3.2500e-003	9.0000e-004	4.1500e-003	9.3000e-004	8.3000e-004	1.7600e-003	0.0000	10.9160	10.9160	1.0000e-004	0.0000	10.9180
Worker	3.6000e-004	4.7000e-004	4.5500e-003	1.0000e-005	7.6000e-004	1.0000e-005	7.7000e-004	2.0000e-004	1.0000e-005	2.1000e-004	0.0000	0.7357	0.7357	4.0000e-005	0.0000	0.7366
Total	**6.8000e-003**	**0.0567**	**0.0785**	**1.3000e-004**	**4.0100e-003**	**9.1000e-004**	**4.9200e-003**	**1.1300e-003**	**8.4000e-004**	**1.9700e-003**	**0.0000**	**11.6517**	**11.6517**	**1.4000e-004**	**0.0000**	**11.6546**

3.11 Stem & Sofit RFP - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.9300e-003	0.2169	0.1564	2.7000e-004		6.0500e-003	6.0500e-003		6.0500e-003	6.0500e-003	0.0000	25.4577	25.4577	7.3100e-003	0.0000	25.6112
Total	**7.9300e-003**	**0.2169**	**0.1564**	**2.7000e-004**		**6.0500e-003**	**6.0500e-003**		**6.0500e-003**	**6.0500e-003**	**0.0000**	**25.4577**	**25.4577**	**7.3100e-003**	**0.0000**	**25.6112**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4400e-003	0.0563	0.0740	1.2000e-004	3.2500e-003	9.0000e-004	4.1500e-003	9.3000e-004	8.3000e-004	1.7600e-003	0.0000	10.9160	10.9160	1.0000e-004	0.0000	10.9180
Worker	3.6000e-004	4.7000e-004	4.5500e-003	1.0000e-005	7.6000e-004	1.0000e-005	7.7000e-004	2.0000e-004	1.0000e-005	2.1000e-004	0.0000	0.7357	0.7357	4.0000e-005	0.0000	0.7366
Total	**6.8000e-003**	**0.0567**	**0.0785**	**1.3000e-004**	**4.0100e-003**	**9.1000e-004**	**4.9200e-003**	**1.1300e-003**	**8.4000e-004**	**1.9700e-003**	**0.0000**	**11.6517**	**11.6517**	**1.4000e-004**	**0.0000**	**11.6546**

3.12 Deck R/F/P - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0751	0.0469	7.0000e-005		5.2900e-003	5.2900e-003		4.9800e-003	4.9800e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**9.1500e-003**	**0.0751**	**0.0469**	**7.0000e-005**		**5.2900e-003**	**5.2900e-003**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4400e-003	0.0563	0.0740	1.2000e-004	3.2500e-003	9.0000e-004	4.1500e-003	9.3000e-004	8.3000e-004	1.7600e-003	0.0000	10.9160	10.9160	1.0000e-004	0.0000	10.9180
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**6.5800e-003**	**0.0564**	**0.0758**	**1.2000e-004**	**3.5500e-003**	**9.0000e-004**	**4.4500e-003**	**1.0100e-003**	**8.3000e-004**	**1.8400e-003**	**0.0000**	**11.2064**	**11.2064**	**1.2000e-004**	**0.0000**	**11.2087**

3.12 Deck R/F/P - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-003	0.0587	0.0445	7.0000e-005		2.2500e-003	2.2500e-003		2.2500e-003	2.2500e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**2.7000e-003**	**0.0587**	**0.0445**	**7.0000e-005**		**2.2500e-003**	**2.2500e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4400e-003	0.0563	0.0740	1.2000e-004	3.2500e-003	9.0000e-004	4.1500e-003	9.3000e-004	8.3000e-004	1.7600e-003	0.0000	10.9160	10.9160	1.0000e-004	0.0000	10.9180
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**6.5800e-003**	**0.0564**	**0.0758**	**1.2000e-004**	**3.5500e-003**	**9.0000e-004**	**4.4500e-003**	**1.0100e-003**	**8.3000e-004**	**1.8400e-003**	**0.0000**	**11.2064**	**11.2064**	**1.2000e-004**	**0.0000**	**11.2087**

3.13 Post-tension Bridge - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0751	0.0469	7.0000e-005		5.2900e-003	5.2900e-003		4.9800e-003	4.9800e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**9.1500e-003**	**0.0751**	**0.0469**	**7.0000e-005**		**5.2900e-003**	**5.2900e-003**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.13 Post-tension Bridge - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-003	0.0587	0.0445	7.0000e-005		2.2500e-003	2.2500e-003		2.2500e-003	2.2500e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**2.7000e-003**	**0.0587**	**0.0445**	**7.0000e-005**		**2.2500e-003**	**2.2500e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.14 Remove Falsework - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0751	0.0469	7.0000e-005		5.2900e-003	5.2900e-003		4.9800e-003	4.9800e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**9.1500e-003**	**0.0751**	**0.0469**	**7.0000e-005**		**5.2900e-003**	**5.2900e-003**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.14 Remove Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-003	0.0587	0.0445	7.0000e-005		2.2500e-003	2.2500e-003		2.2500e-003	2.2500e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**2.7000e-003**	**0.0587**	**0.0445**	**7.0000e-005**		**2.2500e-003**	**2.2500e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.15 Remove Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0751	0.0469	7.0000e-005		5.2900e-003	5.2900e-003		4.9800e-003	4.9800e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**9.1500e-003**	**0.0751**	**0.0469**	**7.0000e-005**		**5.2900e-003**	**5.2900e-003**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.15 Remove Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-003	0.0587	0.0445	7.0000e-005		2.2500e-003	2.2500e-003		2.2500e-003	2.2500e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**2.7000e-003**	**0.0587**	**0.0445**	**7.0000e-005**		**2.2500e-003**	**2.2500e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509603	0.073619	0.192430	0.134105	0.036943	0.005309	0.012459	0.020989	0.001832	0.002087	0.006541	0.000614	0.003471

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Mitigated	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004
Unmitigated	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004

6.2 Area by SubCategory

Unmitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004
Total	**3.0000e-005**	**0.0000**	**2.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**0.0000**	**5.3000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004
Total	**3.0000e-005**	**0.0000**	**2.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**0.0000**	**5.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Summer

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4256-1 CWL

San Diego County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	4.00	Acre	4.00	0.00	0
Other Non-Asphalt Surfaces	24.00	Acre	24.00	0.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2015

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - No structure is proposed

Construction Phase - per contractor

Off-road Equipment - per contractor

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - per contractor

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Per Engineer

Off-road Equipment -

Trips and VMT - Worker trip estimate

Demolition -

Grading - Based on project area

Vechicle Emission Factors -

Vechicle Emission Factors -

Vechicle Emission Factors -

Water And Wastewater -

Construction Off-road Equipment Mitigation - Regulatory Requirements

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	34.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00

tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	30.00	5.00
tblConstructionPhase	NumDays	45.00	5.00
tblConstructionPhase	NumDays	45.00	5.00
tblConstructionPhase	NumDays	45.00	15.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	PhaseEndDate	3/18/2015	4/22/2015
tblConstructionPhase	PhaseStartDate	3/12/2015	4/16/2015
tblGrading	AcresOfGrading	12.50	24.00
tblGrading	AcresOfGrading	12.50	2.00
tblGrading	AcresOfGrading	37.50	2.00
tblGrading	MaterialImported	0.00	7,850.00
tblGrading	MaterialImported	0.00	7,850.00
tblLandUse	LandUseSquareFeet	174,240.00	0.00
tblLandUse	LandUseSquareFeet	1,045,440.00	0.00
tblOffRoadEquipment	HorsePower	162.00	157.00
tblOffRoadEquipment	HorsePower	400.00	381.00
tblOffRoadEquipment	HorsePower	171.00	327.00
tblOffRoadEquipment	HorsePower	255.00	358.00
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.42	0.62
tblOffRoadEquipment	LoadFactor	0.40	0.59

tblProjectCharacteristics	OperationalYear	2014	2015
tblTripsAndVMT	VendorTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	100.00
tblTripsAndVMT	VendorTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	100.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	13.5128	143.2193	96.8601	0.2108	26.5538	6.1221	29.5725	9.9699	5.6751	12.8122	0.0000	21,631.2040	21,631.2040	3.2827	0.0000	21,700.1410
Total	**13.5128**	**143.2193**	**96.8601**	**0.2108**	**26.5538**	**6.1221**	**29.5725**	**9.9699**	**5.6751**	**12.8122**	**0.0000**	**21,631.2040**	**21,631.2040**	**3.2827**	**0.0000**	**21,700.1410**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	6.3807	115.1191	88.7317	0.2108	13.0884	2.7801	14.5900	4.5080	2.7511	5.4702	0.0000	21,631.2040	21,631.2040	3.2827	0.0000	21,700.1410
Total	**6.3807**	**115.1191**	**88.7317**	**0.2108**	**13.0884**	**2.7801**	**14.5900**	**4.5080**	**2.7511**	**5.4702**	**0.0000**	**21,631.2040**	**21,631.2040**	**3.2827**	**0.0000**	**21,700.1410**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**52.78**	**19.62**	**8.39**	**0.00**	**50.71**	**54.59**	**50.66**	**54.78**	**51.52**	**57.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**	**0.0000**	**6.5000e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**	**0.0000**	**6.5000e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grubbing/Clearing	Site Preparation	1/1/2015	1/7/2015	5	5	Site Preparation
2	Grading of mitigation site	Grading	1/8/2015	1/14/2015	5	5	
3	Grading roadway work West Side	Grading	1/15/2015	1/21/2015	5	5	
4	Utilities and Sub-grade	Trenching	1/22/2015	1/28/2015	5	5	
5	Demolition	Demolition	1/29/2015	2/4/2015	5	5	
6	Grading roadway work East Side	Grading	2/5/2015	2/25/2015	5	15	
7	Construct Trestle	Building Construction	2/26/2015	3/4/2015	5	5	
8	Column R/F/P	Building Construction	3/5/2015	3/11/2015	5	5	
9	Falsework	Building Construction	4/16/2015	4/22/2015	5	5	
10	Stem & Sofit RFP	Building Construction	4/23/2015	4/29/2015	5	5	
11	Deck R/F/P	Building Construction	4/30/2015	5/6/2015	5	5	
12	Post-tension Bridge	Building Construction	5/7/2015	5/13/2015	5	5	
13	Remove Falsework	Building Construction	5/14/2015	5/20/2015	5	5	
14	Remove Trestle	Building Construction	5/21/2015	5/27/2015	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grubbing/Clearing	Rubber Tired Dozers	3	8.00	255	0.40
Grubbing/Clearing	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading of mitigation site	Excavators	2	8.00	162	0.38
Grading of mitigation site	Graders	1	8.00	174	0.41
Grading of mitigation site	Rubber Tired Dozers	1	8.00	255	0.40
Grading of mitigation site	Scrapers	2	8.00	361	0.48
Grading of mitigation site	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading roadway work West Side	Excavators	2	8.00	162	0.38
Grading roadway work West Side	Graders	1	8.00	174	0.41
Grading roadway work West Side	Rubber Tired Dozers	1	8.00	255	0.40
Grading roadway work West Side	Scrapers	2	8.00	361	0.48
Grading roadway work West Side	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Grading roadway work East Side	Excavators	2	8.00	162	0.38
Grading roadway work East Side	Graders	1	8.00	174	0.41
Grading roadway work East Side	Rubber Tired Dozers	1	8.00	255	0.40
Grading roadway work East Side	Scrapers	2	8.00	361	0.48
Grading roadway work East Side	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Construct Trestle	Cranes	1	7.00	226	0.29
Construct Trestle	Forklifts	3	8.00	89	0.20
Construct Trestle	Generator Sets	1	8.00	84	0.74
Construct Trestle	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Construct Trestle	Welders	1	8.00	46	0.45

Column R/F/P	Bore/Drill Rigs	0		205	0.50
Column R/F/P	Cranes	1	7.00	226	0.29
Column R/F/P	Forklifts	3	8.00	89	0.20
Column R/F/P	Generator Sets	1	8.00	84	0.74
Column R/F/P	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Column R/F/P	Welders	1	8.00	46	0.45
Falsework	Cranes	1	7.00	226	0.29
Falsework	Forklifts	3	8.00	89	0.20
Falsework	Generator Sets	1	8.00	84	0.74
Falsework	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Falsework	Welders	1	8.00	46	0.45
Stem & Sofit RFP	Cranes	1	7.00	226	0.29
Stem & Sofit RFP	Excavators	1	8.00	157	0.57
Stem & Sofit RFP	Forklifts	3	8.00	89	0.20
Stem & Sofit RFP	Generator Sets	1	8.00	84	0.74
Stem & Sofit RFP	Off-Highway Trucks	2	8.00	381	0.57
Stem & Sofit RFP	Other Construction Equipment	1	8.00	327	0.62
Stem & Sofit RFP	Rubber Tired Dozers	1	8.00	358	0.59
Stem & Sofit RFP	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Stem & Sofit RFP	Welders	1	8.00	46	0.45
Deck R/F/P	Cranes	1	7.00	226	0.29
Deck R/F/P	Forklifts	3	8.00	89	0.20
Deck R/F/P	Generator Sets	1	8.00	84	0.74
Deck R/F/P	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Deck R/F/P	Welders	1	8.00	46	0.45
Post-tension Bridge	Cranes	1	7.00	226	0.29
Post-tension Bridge	Forklifts	3	8.00	89	0.20
Post-tension Bridge	Generator Sets	1	8.00	84	0.74

Post-tension Bridge	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Post-tension Bridge	Welders	1	8.00	46	0.45
Remove Falsework	Cranes	1	7.00	226	0.29
Remove Falsework	Forklifts	3	8.00	89	0.20
Remove Falsework	Generator Sets	1	8.00	84	0.74
Remove Falsework	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Remove Falsework	Welders	1	8.00	46	0.45
Remove Trestle	Cranes	1	7.00	226	0.29
Remove Trestle	Forklifts	3	8.00	89	0.20
Remove Trestle	Generator Sets	1	8.00	84	0.74
Remove Trestle	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Remove Trestle	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grubbing/Clearing	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading of mitigation site	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading roadway work West Side	8	20.00	0.00	981.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Utilities and Sub-grade				0.00	10.80	7.30				
Demolition	6	15.00	0.00	559.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading roadway work East Side	8	20.00	0.00	981.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Construct Trestle	9	15.00	100.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Column R/F/P	9	38.00	200.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Falsework	9	15.00	100.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Stem & Sofit RFP	14	38.00	200.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Deck R/F/P	9	15.00	200.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Post-tension Bridge	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Falsework	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Trestle	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Grubbing/Clearing - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412		4,111.7444	4,111.7444	1.2275		4,137.5225
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**		**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5225**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0690	0.0814	0.8900	1.8700e-003	0.1479	1.1600e-003	0.1490	0.0392	1.0600e-003	0.0403		162.0015	162.0015	8.4900e-003		162.1798
Total	**0.0690**	**0.0814**	**0.8900**	**1.8700e-003**	**0.1479**	**1.1600e-003**	**0.1490**	**0.0392**	**1.0600e-003**	**0.0403**		**162.0015**	**162.0015**	**8.4900e-003**		**162.1798**

3.2 Grubbing/Clearing - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	1.2300	34.4240	23.4003	0.0391		0.9611	0.9611		0.9611	0.9611	0.0000	4,111.744 4	4,111.744 4	1.2275		4,137.522 4
Total	**1.2300**	**34.4240**	**23.4003**	**0.0391**	**8.1298**	**0.9611**	**9.0909**	**4.4688**	**0.9611**	**5.4299**	**0.0000**	**4,111.744 4**	**4,111.744 4**	**1.2275**		**4,137.522 4**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0690	0.0814	0.8900	1.8700e-003	0.1479	1.1600e-003	0.1490	0.0392	1.0600e-003	0.0403		162.0015	162.0015	8.4900e-003		162.1798
Total	**0.0690**	**0.0814**	**0.8900**	**1.8700e-003**	**0.1479**	**1.1600e-003**	**0.1490**	**0.0392**	**1.0600e-003**	**0.0403**		**162.0015**	**162.0015**	**8.4900e-003**		**162.1798**

3.3 Grading of mitigation site - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					11.1125	0.0000	11.1125	3.8599	0.0000	3.8599			0.0000			0.0000
Off-Road	6.7751	79.0467	50.8400	0.0618		3.8022	3.8022		3.4980	3.4980		6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**6.7751**	**79.0467**	**50.8400**	**0.0618**	**11.1125**	**3.8022**	**14.9147**	**3.8599**	**3.4980**	**7.3579**		**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0767	0.0904	0.9888	2.0800e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		180.0017	180.0017	9.4300e-003		180.1998
Total	**0.0767**	**0.0904**	**0.9888**	**2.0800e-003**	**0.1643**	**1.2900e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**180.0017**	**180.0017**	**9.4300e-003**		**180.1998**

3.3 Grading of mitigation site - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.0006	0.0000	5.0006	1.7369	0.0000	1.7369			0.0000			0.0000
Off-Road	1.8922	50.9465	37.9432	0.0618		1.3783	1.3783		1.3783	1.3783	0.0000	6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**1.8922**	**50.9465**	**37.9432**	**0.0618**	**5.0006**	**1.3783**	**6.3789**	**1.7369**	**1.3783**	**3.1152**	**0.0000**	**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0767	0.0904	0.9888	2.0800e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		180.0017	180.0017	9.4300e-003		180.1998
Total	**0.0767**	**0.0904**	**0.9888**	**2.0800e-003**	**0.1643**	**1.2900e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**180.0017**	**180.0017**	**9.4300e-003**		**180.1998**

3.4 Grading roadway work West Side - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.6669	0.0000	6.6669	3.3894	0.0000	3.3894			0.0000			0.0000
Off-Road	6.7751	79.0467	50.8400	0.0618		3.8022	3.8022		3.4980	3.4980		6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**6.7751**	**79.0467**	**50.8400**	**0.0618**	**6.6669**	**3.8022**	**10.4691**	**3.3894**	**3.4980**	**6.8874**		**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.4119	64.0822	43.0059	0.1470	3.4185	0.9949	4.4135	0.9361	0.9151	1.8512		14,964.9590	14,964.9590	0.1212		14,967.5049
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0767	0.0904	0.9888	2.0800e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		180.0017	180.0017	9.4300e-003		180.1998
Total	**4.4886**	**64.1727**	**43.9947**	**0.1491**	**3.5828**	**0.9962**	**4.5790**	**0.9796**	**0.9163**	**1.8959**		**15,144.9607**	**15,144.9607**	**0.1307**		**15,147.7047**

3.4 Grading roadway work West Side - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.0001	0.0000	3.0001	1.5253	0.0000	1.5253			0.0000			0.0000
Off-Road	1.8922	50.9465	37.9432	0.0618		1.3783	1.3783		1.3783	1.3783	0.0000	6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**1.8922**	**50.9465**	**37.9432**	**0.0618**	**3.0001**	**1.3783**	**4.3784**	**1.5253**	**1.3783**	**2.9035**	**0.0000**	**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.4119	64.0822	43.0059	0.1470	3.4185	0.9949	4.4135	0.9361	0.9151	1.8512		14,964.9590	14,964.9590	0.1212		14,967.5049
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0767	0.0904	0.9888	2.0800e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		180.0017	180.0017	9.4300e-003		180.1998
Total	**4.4886**	**64.1727**	**43.9947**	**0.1491**	**3.5828**	**0.9962**	**4.5790**	**0.9796**	**0.9163**	**1.8959**		**15,144.9607**	**15,144.9607**	**0.1307**		**15,147.7047**

3.5 Utilities and Sub-grade - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**0.0000**			**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**0.0000**			**0.0000**

3.6 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.4826	0.0000	24.4826	3.7075	0.0000	3.7075			0.0000			0.0000
Off-Road	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858		4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**	**24.4826**	**2.4508**	**26.9334**	**3.7075**	**2.2858**	**5.9933**		**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.5140	36.5158	24.5059	0.0838	1.9480	0.5669	2.5149	0.5334	0.5215	1.0549		8,527.4333	8,527.4333	0.0691		8,528.8841
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**2.5715**	**36.5836**	**25.2475**	**0.0853**	**2.0712**	**0.5679**	**2.6391**	**0.5661**	**0.5224**	**1.0884**		**8,662.4346**	**8,662.4346**	**0.0762**		**8,664.0339**

3.6 Demolition - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					11.0172	0.0000	11.0172	1.6684	0.0000	1.6684			0.0000			0.0000
Off-Road	1.2905	33.4676	25.2649	0.0399		0.9338	0.9338		0.9338	0.9338	0.0000	4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**1.2905**	**33.4676**	**25.2649**	**0.0399**	**11.0172**	**0.9338**	**11.9509**	**1.6684**	**0.9338**	**2.6022**	**0.0000**	**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.5140	36.5158	24.5059	0.0838	1.9480	0.5669	2.5149	0.5334	0.5215	1.0549		8,527.4333	8,527.4333	0.0691		8,528.8841
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**2.5715**	**36.5836**	**25.2475**	**0.0853**	**2.0712**	**0.5679**	**2.6391**	**0.5661**	**0.5224**	**1.0884**		**8,662.4346**	**8,662.4346**	**0.0762**		**8,664.0339**

3.7 Grading roadway work East Side - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2370	0.0000	6.2370	3.3366	0.0000	3.3366			0.0000			0.0000
Off-Road	6.7751	79.0467	50.8400	0.0618		3.8022	3.8022		3.4980	3.4980		6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**6.7751**	**79.0467**	**50.8400**	**0.0618**	**6.2370**	**3.8022**	**10.0392**	**3.3366**	**3.4980**	**6.8346**		**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.4706	21.3607	14.3353	0.0490	1.1395	0.3316	1.4712	0.3120	0.3050	0.6171		4,988.3197	4,988.3197	0.0404		4,989.1683
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0767	0.0904	0.9888	2.0800e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		180.0017	180.0017	9.4300e-003		180.1998
Total	**1.5473**	**21.4512**	**15.3241**	**0.0511**	**1.3038**	**0.3329**	**1.6367**	**0.3556**	**0.3062**	**0.6618**		**5,168.3214**	**5,168.3214**	**0.0498**		**5,169.3681**

3.7 Grading roadway work East Side - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8067	0.0000	2.8067	1.5015	0.0000	1.5015			0.0000			0.0000
Off-Road	1.8922	50.9465	37.9432	0.0618		1.3783	1.3783		1.3783	1.3783	0.0000	6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**1.8922**	**50.9465**	**37.9432**	**0.0618**	**2.8067**	**1.3783**	**4.1849**	**1.5015**	**1.3783**	**2.8797**	**0.0000**	**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.4706	21.3607	14.3353	0.0490	1.1395	0.3316	1.4712	0.3120	0.3050	0.6171		4,988.3197	4,988.3197	0.0404		4,989.1683
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0767	0.0904	0.9888	2.0800e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		180.0017	180.0017	9.4300e-003		180.1998
Total	**1.5473**	**21.4512**	**15.3241**	**0.0511**	**1.3038**	**0.3329**	**1.6367**	**0.3556**	**0.3062**	**0.6618**		**5,168.3214**	**5,168.3214**	**0.0498**		**5,169.3681**

3.8 Construct Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1805	10.9074	12.1488	0.0239	0.6637	0.1787	0.8424	0.1894	0.1643	0.3537		2,414.2952	2,414.2952	0.0209		2,414.7342
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**1.2380**	**10.9752**	**12.8905**	**0.0254**	**0.7869**	**0.1797**	**0.9666**	**0.2220**	**0.1652**	**0.3873**		**2,549.2965**	**2,549.2965**	**0.0280**		**2,549.8841**

3.8 Construct Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1805	10.9074	12.1488	0.0239	0.6637	0.1787	0.8424	0.1894	0.1643	0.3537		2,414.2952	2,414.2952	0.0209		2,414.7342
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**1.2380**	**10.9752**	**12.8905**	**0.0254**	**0.7869**	**0.1797**	**0.9666**	**0.2220**	**0.1652**	**0.3873**		**2,549.2965**	**2,549.2965**	**0.0280**		**2,549.8841**

3.9 Column R/F/P - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.3611	21.8148	24.2977	0.0477	1.3274	0.3574	1.6848	0.3787	0.3287	0.7074		4,828.5905	4,828.5905	0.0418		4,829.4684
Worker	0.1457	0.1718	1.8788	3.9600e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		342.0032	342.0032	0.0179		342.3796
Total	**2.5067**	**21.9866**	**26.1765**	**0.0517**	**1.6396**	**0.3599**	**1.9995**	**0.4615**	**0.3309**	**0.7924**		**5,170.5937**	**5,170.5937**	**0.0597**		**5,171.8481**

3.9 Column R/F/P - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.577 1	2,689.577 1	0.6748		2,703.748 3
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.577 1**	**2,689.577 1**	**0.6748**		**2,703.748 3**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.3611	21.8148	24.2977	0.0477	1.3274	0.3574	1.6848	0.3787	0.3287	0.7074		4,828.590 5	4,828.590 5	0.0418		4,829.468 4
Worker	0.1457	0.1718	1.8788	3.9600e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		342.0032	342.0032	0.0179		342.3796
Total	**2.5067**	**21.9866**	**26.1765**	**0.0517**	**1.6396**	**0.3599**	**1.9995**	**0.4615**	**0.3309**	**0.7924**		**5,170.593 7**	**5,170.593 7**	**0.0597**		**5,171.848 1**

3.10 Falsework - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1805	10.9074	12.1488	0.0239	0.6637	0.1787	0.8424	0.1894	0.1643	0.3537		2,414.2952	2,414.2952	0.0209		2,414.7342
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**1.2380**	**10.9752**	**12.8905**	**0.0254**	**0.7869**	**0.1797**	**0.9666**	**0.2220**	**0.1652**	**0.3873**		**2,549.2965**	**2,549.2965**	**0.0280**		**2,549.8841**

3.10 Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1805	10.9074	12.1488	0.0239	0.6637	0.1787	0.8424	0.1894	0.1643	0.3537		2,414.2952	2,414.2952	0.0209		2,414.7342
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**1.2380**	**10.9752**	**12.8905**	**0.0254**	**0.7869**	**0.1797**	**0.9666**	**0.2220**	**0.1652**	**0.3873**		**2,549.2965**	**2,549.2965**	**0.0280**		**2,549.8841**

3.11 Stem & Sofit RFP - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	11.0061	117.3680	70.6836	0.1081		5.7622	5.7622		5.3442	5.3442		11,224.9341	11,224.9341	3.2230		11,292.6167
Total	**11.0061**	**117.3680**	**70.6836**	**0.1081**		**5.7622**	**5.7622**		**5.3442**	**5.3442**		**11,224.9341**	**11,224.9341**	**3.2230**		**11,292.6167**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.3611	21.8148	24.2977	0.0477	1.3274	0.3574	1.6848	0.3787	0.3287	0.7074		4,828.5905	4,828.5905	0.0418		4,829.4684
Worker	0.1457	0.1718	1.8788	3.9600e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		342.0032	342.0032	0.0179		342.3796
Total	**2.5067**	**21.9866**	**26.1765**	**0.0517**	**1.6396**	**0.3599**	**1.9995**	**0.4615**	**0.3309**	**0.7924**		**5,170.5937**	**5,170.5937**	**0.0597**		**5,171.8481**

3.11 Stem & Sofit RFP - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1734	86.7471	62.5552	0.1081		2.4202	2.4202		2.4202	2.4202	0.0000	11,224.9341	11,224.9341	3.2230		11,292.6167
Total	**3.1734**	**86.7471**	**62.5552**	**0.1081**		**2.4202**	**2.4202**		**2.4202**	**2.4202**	**0.0000**	**11,224.9341**	**11,224.9341**	**3.2230**		**11,292.6167**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.3611	21.8148	24.2977	0.0477	1.3274	0.3574	1.6848	0.3787	0.3287	0.7074		4,828.5905	4,828.5905	0.0418		4,829.4684
Worker	0.1457	0.1718	1.8788	3.9600e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		342.0032	342.0032	0.0179		342.3796
Total	**2.5067**	**21.9866**	**26.1765**	**0.0517**	**1.6396**	**0.3599**	**1.9995**	**0.4615**	**0.3309**	**0.7924**		**5,170.5937**	**5,170.5937**	**0.0597**		**5,171.8481**

3.12 Deck R/F/P - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.577 1	2,689.577 1	0.6748		2,703.748 3
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.577 1**	**2,689.577 1**	**0.6748**		**2,703.748 3**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.3611	21.8148	24.2977	0.0477	1.3274	0.3574	1.6848	0.3787	0.3287	0.7074		4,828.590 5	4,828.590 5	0.0418		4,829.468 4
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**2.4186**	**21.8826**	**25.0393**	**0.0493**	**1.4506**	**0.3584**	**1.8090**	**0.4114**	**0.3296**	**0.7409**		**4,963.591 8**	**4,963.591 8**	**0.0489**		**4,964.618 3**

3.12 Deck R/F/P - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.3611	21.8148	24.2977	0.0477	1.3274	0.3574	1.6848	0.3787	0.3287	0.7074		4,828.5905	4,828.5905	0.0418		4,829.4684
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**2.4186**	**21.8826**	**25.0393**	**0.0493**	**1.4506**	**0.3584**	**1.8090**	**0.4114**	**0.3296**	**0.7409**		**4,963.5918**	**4,963.5918**	**0.0489**		**4,964.6183**

3.13 Post-tension Bridge - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.577 1	2,689.577 1	0.6748		2,703.748 3
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.577 1**	**2,689.577 1**	**0.6748**		**2,703.748 3**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.13 Post-tension Bridge - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.14 Remove Falsework - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.14 Remove Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.15 Remove Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.15 Remove Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509603	0.073619	0.192430	0.134105	0.036943	0.005309	0.012459	0.020989	0.001832	0.002087	0.006541	0.000614	0.003471

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

Land Use	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Unmitigated	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**		**6.5000e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**		**6.5000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Winter

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4256-1 CWL

San Diego County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	4.00	Acre	4.00	0.00	0
Other Non-Asphalt Surfaces	24.00	Acre	24.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2015
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - No structure is proposed

Construction Phase - per contractor

Off-road Equipment - per contractor

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - per contractor

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Per Engineer

Off-road Equipment -

Trips and VMT - Worker trip estimate

Demolition -

Grading - Based on project area

Vechicle Emission Factors -

Vechicle Emission Factors -

Vechicle Emission Factors -

Water And Wastewater -

Construction Off-road Equipment Mitigation - Regulatory Requirements

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	34.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
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tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00

tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
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tblConstructionPhase	NumDays	30.00	5.00
tblConstructionPhase	NumDays	45.00	5.00
tblConstructionPhase	NumDays	45.00	5.00
tblConstructionPhase	NumDays	45.00	15.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	PhaseEndDate	3/18/2015	4/22/2015
tblConstructionPhase	PhaseStartDate	3/12/2015	4/16/2015
tblGrading	AcresOfGrading	12.50	24.00
tblGrading	AcresOfGrading	12.50	2.00
tblGrading	AcresOfGrading	37.50	2.00
tblGrading	MaterialImported	0.00	7,850.00
tblGrading	MaterialImported	0.00	7,850.00
tblLandUse	LandUseSquareFeet	174,240.00	0.00
tblLandUse	LandUseSquareFeet	1,045,440.00	0.00
tblOffRoadEquipment	HorsePower	162.00	157.00
tblOffRoadEquipment	HorsePower	400.00	381.00
tblOffRoadEquipment	HorsePower	171.00	327.00
tblOffRoadEquipment	HorsePower	255.00	358.00
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.42	0.62
tblOffRoadEquipment	LoadFactor	0.40	0.59

tblProjectCharacteristics	OperationalYear	2014	2015
tblTripsAndVMT	VendorTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	100.00
tblTripsAndVMT	VendorTripNumber	0.00	200.00
tblTripsAndVMT	VendorTripNumber	0.00	100.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	13.8959	145.2992	106.5425	0.2106	26.5538	6.1264	29.5747	9.9699	5.6791	12.8122	0.0000	21,585.2938	21,585.2938	3.2837	0.0000	21,654.2513
Total	**13.8959**	**145.2992**	**106.5425**	**0.2106**	**26.5538**	**6.1264**	**29.5747**	**9.9699**	**5.6791**	**12.8122**	**0.0000**	**21,585.2938**	**21,585.2938**	**3.2837**	**0.0000**	**21,654.2513**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	6.8866	117.1989	96.6234	0.2106	13.0884	2.7844	14.5922	4.5080	2.7551	5.4702	0.0000	21,585.2938	21,585.2938	3.2837	0.0000	21,654.2513
Total	**6.8866**	**117.1989**	**96.6234**	**0.2106**	**13.0884**	**2.7844**	**14.5922**	**4.5080**	**2.7551**	**5.4702**	**0.0000**	**21,585.2938**	**21,585.2938**	**3.2837**	**0.0000**	**21,654.2513**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**50.44**	**19.34**	**9.31**	**0.00**	**50.71**	**54.55**	**50.66**	**54.78**	**51.49**	**57.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**	**0.0000**	**6.5000e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**	**0.0000**	**6.5000e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grubbing/Clearing	Site Preparation	1/1/2015	1/7/2015	5	5	Site Preparation
2	Grading of mitigation site	Grading	1/8/2015	1/14/2015	5	5	
3	Grading roadway work West Side	Grading	1/15/2015	1/21/2015	5	5	
4	Utilities and Sub-grade	Trenching	1/22/2015	1/28/2015	5	5	
5	Demolition	Demolition	1/29/2015	2/4/2015	5	5	
6	Grading roadway work East Side	Grading	2/5/2015	2/25/2015	5	15	
7	Construct Trestle	Building Construction	2/26/2015	3/4/2015	5	5	
8	Column R/F/P	Building Construction	3/5/2015	3/11/2015	5	5	
9	Falsework	Building Construction	4/16/2015	4/22/2015	5	5	
10	Stem & Sofit RFP	Building Construction	4/23/2015	4/29/2015	5	5	
11	Deck R/F/P	Building Construction	4/30/2015	5/6/2015	5	5	
12	Post-tension Bridge	Building Construction	5/7/2015	5/13/2015	5	5	
13	Remove Falsework	Building Construction	5/14/2015	5/20/2015	5	5	
14	Remove Trestle	Building Construction	5/21/2015	5/27/2015	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grubbing/Clearing	Rubber Tired Dozers	3	8.00	255	0.40
Grubbing/Clearing	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading of mitigation site	Excavators	2	8.00	162	0.38
Grading of mitigation site	Graders	1	8.00	174	0.41
Grading of mitigation site	Rubber Tired Dozers	1	8.00	255	0.40
Grading of mitigation site	Scrapers	2	8.00	361	0.48
Grading of mitigation site	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading roadway work West Side	Excavators	2	8.00	162	0.38
Grading roadway work West Side	Graders	1	8.00	174	0.41
Grading roadway work West Side	Rubber Tired Dozers	1	8.00	255	0.40
Grading roadway work West Side	Scrapers	2	8.00	361	0.48
Grading roadway work West Side	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Grading roadway work East Side	Excavators	2	8.00	162	0.38
Grading roadway work East Side	Graders	1	8.00	174	0.41
Grading roadway work East Side	Rubber Tired Dozers	1	8.00	255	0.40
Grading roadway work East Side	Scrapers	2	8.00	361	0.48
Grading roadway work East Side	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Construct Trestle	Cranes	1	7.00	226	0.29
Construct Trestle	Forklifts	3	8.00	89	0.20
Construct Trestle	Generator Sets	1	8.00	84	0.74
Construct Trestle	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Construct Trestle	Welders	1	8.00	46	0.45

Column R/F/P	Bore/Drill Rigs	0		205	0.50
Column R/F/P	Cranes	1	7.00	226	0.29
Column R/F/P	Forklifts	3	8.00	89	0.20
Column R/F/P	Generator Sets	1	8.00	84	0.74
Column R/F/P	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Column R/F/P	Welders	1	8.00	46	0.45
Falsework	Cranes	1	7.00	226	0.29
Falsework	Forklifts	3	8.00	89	0.20
Falsework	Generator Sets	1	8.00	84	0.74
Falsework	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Falsework	Welders	1	8.00	46	0.45
Stem & Sofit RFP	Cranes	1	7.00	226	0.29
Stem & Sofit RFP	Excavators	1	8.00	157	0.57
Stem & Sofit RFP	Forklifts	3	8.00	89	0.20
Stem & Sofit RFP	Generator Sets	1	8.00	84	0.74
Stem & Sofit RFP	Off-Highway Trucks	2	8.00	381	0.57
Stem & Sofit RFP	Other Construction Equipment	1	8.00	327	0.62
Stem & Sofit RFP	Rubber Tired Dozers	1	8.00	358	0.59
Stem & Sofit RFP	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Stem & Sofit RFP	Welders	1	8.00	46	0.45
Deck R/F/P	Cranes	1	7.00	226	0.29
Deck R/F/P	Forklifts	3	8.00	89	0.20
Deck R/F/P	Generator Sets	1	8.00	84	0.74
Deck R/F/P	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Deck R/F/P	Welders	1	8.00	46	0.45
Post-tension Bridge	Cranes	1	7.00	226	0.29
Post-tension Bridge	Forklifts	3	8.00	89	0.20
Post-tension Bridge	Generator Sets	1	8.00	84	0.74

Post-tension Bridge	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Post-tension Bridge	Welders	1	8.00	46	0.45
Remove Falsework	Cranes	1	7.00	226	0.29
Remove Falsework	Forklifts	3	8.00	89	0.20
Remove Falsework	Generator Sets	1	8.00	84	0.74
Remove Falsework	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Remove Falsework	Welders	1	8.00	46	0.45
Remove Trestle	Cranes	1	7.00	226	0.29
Remove Trestle	Forklifts	3	8.00	89	0.20
Remove Trestle	Generator Sets	1	8.00	84	0.74
Remove Trestle	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Remove Trestle	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grubbing/Clearing	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading of mitigation site	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading roadway work West Side	8	20.00	0.00	981.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Utilities and Sub-grade				0.00	10.80	7.30				
Demolition	6	15.00	0.00	559.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading roadway work East Side	8	20.00	0.00	981.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Construct Trestle	9	15.00	100.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Column R/F/P	9	38.00	200.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Falsework	9	15.00	100.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Stem & Sofit RFP	14	38.00	200.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Deck R/F/P	9	15.00	200.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Post-tension Bridge	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Falsework	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Trestle	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Grubbing/Clearing - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412		4,111.7444	4,111.7444	1.2275		4,137.5225
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**		**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5225**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0734	0.0913	0.8682	1.7600e-003	0.1479	1.1600e-003	0.1490	0.0392	1.0600e-003	0.0403		152.1487	152.1487	8.4900e-003		152.3270
Total	**0.0734**	**0.0913**	**0.8682**	**1.7600e-003**	**0.1479**	**1.1600e-003**	**0.1490**	**0.0392**	**1.0600e-003**	**0.0403**		**152.1487**	**152.1487**	**8.4900e-003**		**152.3270**

3.2 Grubbing/Clearing - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	1.2300	34.4240	23.4003	0.0391		0.9611	0.9611		0.9611	0.9611	0.0000	4,111.744 4	4,111.744 4	1.2275		4,137.522 4
Total	**1.2300**	**34.4240**	**23.4003**	**0.0391**	**8.1298**	**0.9611**	**9.0909**	**4.4688**	**0.9611**	**5.4299**	**0.0000**	**4,111.744 4**	**4,111.744 4**	**1.2275**		**4,137.522 4**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0734	0.0913	0.8682	1.7600e-003	0.1479	1.1600e-003	0.1490	0.0392	1.0600e-003	0.0403		152.1487	152.1487	8.4900e-003		152.3270
Total	**0.0734**	**0.0913**	**0.8682**	**1.7600e-003**	**0.1479**	**1.1600e-003**	**0.1490**	**0.0392**	**1.0600e-003**	**0.0403**		**152.1487**	**152.1487**	**8.4900e-003**		**152.3270**

3.3 Grading of mitigation site - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					11.1125	0.0000	11.1125	3.8599	0.0000	3.8599			0.0000			0.0000
Off-Road	6.7751	79.0467	50.8400	0.0618		3.8022	3.8022		3.4980	3.4980		6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**6.7751**	**79.0467**	**50.8400**	**0.0618**	**11.1125**	**3.8022**	**14.9147**	**3.8599**	**3.4980**	**7.3579**		**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0815	0.1015	0.9647	1.9600e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		169.0541	169.0541	9.4300e-003		169.2522
Total	**0.0815**	**0.1015**	**0.9647**	**1.9600e-003**	**0.1643**	**1.2900e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**169.0541**	**169.0541**	**9.4300e-003**		**169.2522**

3.3 Grading of mitigation site - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.0006	0.0000	5.0006	1.7369	0.0000	1.7369			0.0000			0.0000
Off-Road	1.8922	50.9465	37.9432	0.0618		1.3783	1.3783		1.3783	1.3783	0.0000	6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**1.8922**	**50.9465**	**37.9432**	**0.0618**	**5.0006**	**1.3783**	**6.3789**	**1.7369**	**1.3783**	**3.1152**	**0.0000**	**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0815	0.1015	0.9647	1.9600e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		169.0541	169.0541	9.4300e-003		169.2522
Total	**0.0815**	**0.1015**	**0.9647**	**1.9600e-003**	**0.1643**	**1.2900e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**169.0541**	**169.0541**	**9.4300e-003**		**169.2522**

3.4 Grading roadway work West Side - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Fugitive Dust					6.6669	0.0000	6.6669	3.3894	0.0000	3.3894			0.0000			0.0000
Off-Road	6.7751	79.0467	50.8400	0.0618		3.8022	3.8022		3.4980	3.4980		6,486.243 3	6,486.243 3	1.9364		6,526.908 0
Total	**6.7751**	**79.0467**	**50.8400**	**0.0618**	**6.6669**	**3.8022**	**10.4691**	**3.3894**	**3.4980**	**6.8874**		**6,486.243 3**	**6,486.243 3**	**1.9364**		**6,526.908 0**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Hauling	4.9129	66.1510	54.7378	0.1469	3.4185	0.9988	4.4173	0.9361	0.9187	1.8548		14,929.99 64	14,929.99 64	0.1227		14,932.57 28
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0815	0.1015	0.9647	1.9600e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		169.0541	169.0541	9.4300e-003		169.2522
Total	**4.9945**	**66.2525**	**55.7025**	**0.1488**	**3.5828**	**1.0001**	**4.5829**	**0.9796**	**0.9199**	**1.8995**		**15,099.05 05**	**15,099.05 05**	**0.1321**		**15,101.82 50**

3.4 Grading roadway work West Side - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.0001	0.0000	3.0001	1.5253	0.0000	1.5253			0.0000			0.0000
Off-Road	1.8922	50.9465	37.9432	0.0618		1.3783	1.3783		1.3783	1.3783	0.0000	6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**1.8922**	**50.9465**	**37.9432**	**0.0618**	**3.0001**	**1.3783**	**4.3784**	**1.5253**	**1.3783**	**2.9035**	**0.0000**	**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.9129	66.1510	54.7378	0.1469	3.4185	0.9988	4.4173	0.9361	0.9187	1.8548		14,929.9964	14,929.9964	0.1227		14,932.5728
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0815	0.1015	0.9647	1.9600e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		169.0541	169.0541	9.4300e-003		169.2522
Total	**4.9945**	**66.2525**	**55.7025**	**0.1488**	**3.5828**	**1.0001**	**4.5829**	**0.9796**	**0.9199**	**1.8995**		**15,099.0505**	**15,099.0505**	**0.1321**		**15,101.8250**

3.5 Utilities and Sub-grade - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**0.0000**			**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**0.0000**			**0.0000**

3.6 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.4826	0.0000	24.4826	3.7075	0.0000	3.7075			0.0000			0.0000
Off-Road	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858		4,127.193 4	4,127.193 4	1.1188		4,150.688 6
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**	**24.4826**	**2.4508**	**26.9334**	**3.7075**	**2.2858**	**5.9933**		**4,127.193 4**	**4,127.193 4**	**1.1188**		**4,150.688 6**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.7995	37.6946	31.1911	0.0837	1.9480	0.5691	2.5171	0.5334	0.5235	1.0569		8,507.510 7	8,507.510 7	0.0699		8,508.978 8
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**2.8607**	**37.7707**	**31.9146**	**0.0852**	**2.0712**	**0.5701**	**2.6413**	**0.5661**	**0.5244**	**1.0905**		**8,634.301 3**	**8,634.301 3**	**0.0770**		**8,635.918 0**

3.6 Demolition - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					11.0172	0.0000	11.0172	1.6684	0.0000	1.6684			0.0000			0.0000
Off-Road	1.2905	33.4676	25.2649	0.0399		0.9338	0.9338		0.9338	0.9338	0.0000	4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**1.2905**	**33.4676**	**25.2649**	**0.0399**	**11.0172**	**0.9338**	**11.9509**	**1.6684**	**0.9338**	**2.6022**	**0.0000**	**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.7995	37.6946	31.1911	0.0837	1.9480	0.5691	2.5171	0.5334	0.5235	1.0569		8,507.5107	8,507.5107	0.0699		8,508.9788
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**2.8607**	**37.7707**	**31.9146**	**0.0852**	**2.0712**	**0.5701**	**2.6413**	**0.5661**	**0.5244**	**1.0905**		**8,634.3013**	**8,634.3013**	**0.0770**		**8,635.9180**

3.7 Grading roadway work East Side - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2370	0.0000	6.2370	3.3366	0.0000	3.3366			0.0000			0.0000
Off-Road	6.7751	79.0467	50.8400	0.0618		3.8022	3.8022		3.4980	3.4980		6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**6.7751**	**79.0467**	**50.8400**	**0.0618**	**6.2370**	**3.8022**	**10.0392**	**3.3366**	**3.4980**	**6.8346**		**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.6377	22.0503	18.2459	0.0490	1.1395	0.3329	1.4725	0.3120	0.3062	0.6183		4,976.6655	4,976.6655	0.0409		4,977.5243
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0815	0.1015	0.9647	1.9600e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		169.0541	169.0541	9.4300e-003		169.2522
Total	**1.7192**	**22.1518**	**19.2106**	**0.0509**	**1.3038**	**0.3342**	**1.6380**	**0.3556**	**0.3074**	**0.6630**		**5,145.7196**	**5,145.7196**	**0.0503**		**5,146.7765**

3.7 Grading roadway work East Side - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8067	0.0000	2.8067	1.5015	0.0000	1.5015			0.0000			0.0000
Off-Road	1.8922	50.9465	37.9432	0.0618		1.3783	1.3783		1.3783	1.3783	0.0000	6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**1.8922**	**50.9465**	**37.9432**	**0.0618**	**2.8067**	**1.3783**	**4.1849**	**1.5015**	**1.3783**	**2.8797**	**0.0000**	**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.6377	22.0503	18.2459	0.0490	1.1395	0.3329	1.4725	0.3120	0.3062	0.6183		4,976.6655	4,976.6655	0.0409		4,977.5243
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0815	0.1015	0.9647	1.9600e-003	0.1643	1.2900e-003	0.1656	0.0436	1.1800e-003	0.0448		169.0541	169.0541	9.4300e-003		169.2522
Total	**1.7192**	**22.1518**	**19.2106**	**0.0509**	**1.3038**	**0.3342**	**1.6380**	**0.3556**	**0.3074**	**0.6630**		**5,145.7196**	**5,145.7196**	**0.0503**		**5,146.7765**

3.8 Construct Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.3675	11.1781	16.1176	0.0237	0.6637	0.1809	0.8446	0.1894	0.1663	0.3557		2,395.8834	2,395.8834	0.0214		2,396.3326
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**1.4287**	**11.2542**	**16.8411**	**0.0252**	**0.7869**	**0.1818**	**0.9688**	**0.2220**	**0.1672**	**0.3892**		**2,522.6739**	**2,522.6739**	**0.0285**		**2,523.2718**

3.8 Construct Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.577 1	2,689.577 1	0.6748		2,703.748 3
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.577 1**	**2,689.577 1**	**0.6748**		**2,703.748 3**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.3675	11.1781	16.1176	0.0237	0.6637	0.1809	0.8446	0.1894	0.1663	0.3557		2,395.883 4	2,395.883 4	0.0214		2,396.332 6
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**1.4287**	**11.2542**	**16.8411**	**0.0252**	**0.7869**	**0.1818**	**0.9688**	**0.2220**	**0.1672**	**0.3892**		**2,522.673 9**	**2,522.673 9**	**0.0285**		**2,523.271 8**

3.9 Column R/F/P - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.7350	22.3561	32.2353	0.0475	1.3274	0.3617	1.6891	0.3787	0.3326	0.7113		4,791.7667	4,791.7667	0.0428		4,792.6652
Worker	0.1549	0.1928	1.8329	3.7100e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		321.2027	321.2027	0.0179		321.5792
Total	**2.8899**	**22.5489**	**34.0682**	**0.0512**	**1.6396**	**0.3642**	**2.0037**	**0.4615**	**0.3349**	**0.7964**		**5,112.9694**	**5,112.9694**	**0.0607**		**5,114.2444**

3.9 Column R/F/P - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.7350	22.3561	32.2353	0.0475	1.3274	0.3617	1.6891	0.3787	0.3326	0.7113		4,791.7667	4,791.7667	0.0428		4,792.6652
Worker	0.1549	0.1928	1.8329	3.7100e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		321.2027	321.2027	0.0179		321.5792
Total	**2.8899**	**22.5489**	**34.0682**	**0.0512**	**1.6396**	**0.3642**	**2.0037**	**0.4615**	**0.3349**	**0.7964**		**5,112.9694**	**5,112.9694**	**0.0607**		**5,114.2444**

3.10 Falsework - 2015

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.577 1	2,689.577 1	0.6748		2,703.748 3
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.577 1**	**2,689.577 1**	**0.6748**		**2,703.748 3**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.3675	11.1781	16.1176	0.0237	0.6637	0.1809	0.8446	0.1894	0.1663	0.3557		2,395.883 4	2,395.883 4	0.0214		2,396.332 6
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**1.4287**	**11.2542**	**16.8411**	**0.0252**	**0.7869**	**0.1818**	**0.9688**	**0.2220**	**0.1672**	**0.3892**		**2,522.673 9**	**2,522.673 9**	**0.0285**		**2,523.271 8**

3.10 Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.3675	11.1781	16.1176	0.0237	0.6637	0.1809	0.8446	0.1894	0.1663	0.3557		2,395.8834	2,395.8834	0.0214		2,396.3326
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**1.4287**	**11.2542**	**16.8411**	**0.0252**	**0.7869**	**0.1818**	**0.9688**	**0.2220**	**0.1672**	**0.3892**		**2,522.6739**	**2,522.6739**	**0.0285**		**2,523.2718**

3.11 Stem & Sofit RFP - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	11.0061	117.3680	70.6836	0.1081		5.7622	5.7622		5.3442	5.3442		11,224.9341	11,224.9341	3.2230		11,292.6167
Total	**11.0061**	**117.3680**	**70.6836**	**0.1081**		**5.7622**	**5.7622**		**5.3442**	**5.3442**		**11,224.9341**	**11,224.9341**	**3.2230**		**11,292.6167**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.7350	22.3561	32.2353	0.0475	1.3274	0.3617	1.6891	0.3787	0.3326	0.7113		4,791.7667	4,791.7667	0.0428		4,792.6652
Worker	0.1549	0.1928	1.8329	3.7100e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		321.2027	321.2027	0.0179		321.5792
Total	**2.8899**	**22.5489**	**34.0682**	**0.0512**	**1.6396**	**0.3642**	**2.0037**	**0.4615**	**0.3349**	**0.7964**		**5,112.9694**	**5,112.9694**	**0.0607**		**5,114.2444**

3.11 Stem & Sofit RFP - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1734	86.7471	62.5552	0.1081		2.4202	2.4202		2.4202	2.4202	0.0000	11,224.9341	11,224.9341	3.2230		11,292.6167
Total	**3.1734**	**86.7471**	**62.5552**	**0.1081**		**2.4202**	**2.4202**		**2.4202**	**2.4202**	**0.0000**	**11,224.9341**	**11,224.9341**	**3.2230**		**11,292.6167**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.7350	22.3561	32.2353	0.0475	1.3274	0.3617	1.6891	0.3787	0.3326	0.7113		4,791.7667	4,791.7667	0.0428		4,792.6652
Worker	0.1549	0.1928	1.8329	3.7100e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		321.2027	321.2027	0.0179		321.5792
Total	**2.8899**	**22.5489**	**34.0682**	**0.0512**	**1.6396**	**0.3642**	**2.0037**	**0.4615**	**0.3349**	**0.7964**		**5,112.9694**	**5,112.9694**	**0.0607**		**5,114.2444**

3.12 Deck R/F/P - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.577 1	2,689.577 1	0.6748		2,703.748 3
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.577 1**	**2,689.577 1**	**0.6748**		**2,703.748 3**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.7350	22.3561	32.2353	0.0475	1.3274	0.3617	1.6891	0.3787	0.3326	0.7113		4,791.766 7	4,791.766 7	0.0428		4,792.665 2
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**2.7962**	**22.4322**	**32.9588**	**0.0489**	**1.4506**	**0.3627**	**1.8133**	**0.4114**	**0.3335**	**0.7449**		**4,918.557 3**	**4,918.557 3**	**0.0499**		**4,919.604 3**

3.12 Deck R/F/P - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.7350	22.3561	32.2353	0.0475	1.3274	0.3617	1.6891	0.3787	0.3326	0.7113		4,791.7667	4,791.7667	0.0428		4,792.6652
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**2.7962**	**22.4322**	**32.9588**	**0.0489**	**1.4506**	**0.3627**	**1.8133**	**0.4114**	**0.3335**	**0.7449**		**4,918.5573**	**4,918.5573**	**0.0499**		**4,919.6043**

3.13 Post-tension Bridge - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.13 Post-tension Bridge - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.14 Remove Falsework - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.14 Remove Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.15 Remove Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.15 Remove Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0782	23.4615	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**1.0782**	**23.4615**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509603	0.073619	0.192430	0.134105	0.036943	0.005309	0.012459	0.020989	0.001832	0.002087	0.006541	0.000614	0.003471

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Unmitigated	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**		**6.5000e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**		**6.5000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

ATTACHMENT 2
Eastern Alignment and Roundabout—CalEEMod Input/Output

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Annual

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4256-1 Eastern

San Diego County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	4.00	Acre	4.00	0.00	0
Other Non-Asphalt Surfaces	24.00	Acre	24.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2015
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Roadway only, no buildings

Construction Phase - per contractor

Off-road Equipment - per contractor

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Off-road Equipment -

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Off-road Equipment -

Off-road Equipment - Per Contractor

Off-road Equipment - per contractor

Off-road Equipment - Per Contractor

Off-road Equipment -

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Trips and VMT - Default indicated no worker trips on some phases, trips added

On-road Fugitive Dust -

Grading - Per Contractor

Vechicle Emission Factors -

Vechicle Emission Factors -

Vechicle Emission Factors -

Construction Off-road Equipment Mitigation - Regulatory Compliance

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	30.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	38.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
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tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00

tblConstructionPhase	NumDays	440.00	15.00
tblConstructionPhase	NumDays	440.00	15.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	15.00
tblConstructionPhase	NumDays	440.00	15.00
tblConstructionPhase	NumDays	30.00	10.00
tblConstructionPhase	NumDays	45.00	10.00
tblConstructionPhase	NumDays	45.00	55.00
tblConstructionPhase	NumDays	35.00	15.00
tblConstructionPhase	NumDays	20.00	17.00
tblConstructionPhase	PhaseEndDate	2/6/2015	1/14/2015
tblConstructionPhase	PhaseEndDate	4/1/2015	4/10/2015
tblConstructionPhase	PhaseStartDate	7/18/2015	7/20/2015
tblConstructionPhase	PhaseStartDate	7/25/2015	7/27/2015
tblConstructionPhase	PhaseStartDate	8/1/2015	8/3/2015
tblConstructionPhase	PhaseStartDate	4/11/2015	4/13/2015
tblConstructionPhase	PhaseStartDate	4/18/2015	4/20/2015
tblConstructionPhase	PhaseStartDate	5/9/2015	5/11/2015
tblConstructionPhase	PhaseStartDate	5/30/2015	6/1/2015
tblConstructionPhase	PhaseStartDate	6/6/2015	6/8/2015
tblConstructionPhase	PhaseStartDate	6/27/2015	6/29/2015
tblConstructionPhase	PhaseStartDate	8/29/2015	8/31/2015
tblConstructionPhase	PhaseStartDate	1/24/2015	1/1/2015
tblConstructionPhase	PhaseStartDate	1/15/2015	1/26/2015
tblConstructionPhase	PhaseStartDate	8/8/2015	8/10/2015
tblGrading	AcresOfGrading	25.00	24.00
tblGrading	AcresOfGrading	137.50	4.00
tblGrading	MaterialImported	0.00	51,600.00

tblLandUse	LandUseSquareFeet	174,240.00	0.00
tblLandUse	LandUseSquareFeet	1,045,440.00	0.00
tblOffRoadEquipment	HorsePower	9.00	97.00
tblOffRoadEquipment	HorsePower	9.00	97.00
tblOffRoadEquipment	HorsePower	9.00	97.00
tblOffRoadEquipment	LoadFactor	0.56	0.37
tblOffRoadEquipment	LoadFactor	0.56	0.37
tblOffRoadEquipment	LoadFactor	0.56	0.37
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2015
tblTripsAndVMT	HaulingTripNumber	6,450.00	0.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	38.00
tblTripsAndVMT	WorkerTripNumber	8.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00

tblTripsAndVMT	WorkerTripNumber	0.00	25.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.4208	4.2471	2.8233	3.5300e-003	0.3885	0.2340	0.6225	0.1992	0.2171	0.4163	0.0000	328.6437	328.6437	0.0885	0.0000	330.5019
Total	**0.4208**	**4.2471**	**2.8233**	**3.5300e-003**	**0.3885**	**0.2340**	**0.6225**	**0.1992**	**0.2171**	**0.4163**	**0.0000**	**328.6437**	**328.6437**	**0.0885**	**0.0000**	**330.5019**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.0847	2.7022	2.0862	3.5300e-003	0.1841	0.0692	0.2533	0.0921	0.0712	0.1633	0.0000	328.6433	328.6433	0.0885	0.0000	330.5015
Total	**0.0847**	**2.7022**	**2.0862**	**3.5300e-003**	**0.1841**	**0.0692**	**0.2533**	**0.0921**	**0.0712**	**0.1633**	**0.0000**	**328.6433**	**328.6433**	**0.0885**	**0.0000**	**330.5015**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**79.86**	**36.38**	**26.11**	**0.00**	**52.62**	**70.42**	**59.31**	**53.77**	**67.23**	**60.79**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0000e-005**	**0.0000**	**2.7000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**0.0000**	**5.3000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0000e-005**	**0.0000**	**2.7000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**0.0000**	**5.3000e-004**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Clearing and Grubing	Site Preparation	1/1/2015	1/23/2015	5	17	
2	grading of mitigation site	Grading	1/1/2015	1/14/2015	5	10	
3	Grading N & S roadway	Grading	1/26/2015	4/10/2015	5	55	
4	Construct Trestle	Building Construction	4/13/2015	4/17/2015	5	5	
5	Drill Piles	Building Construction	4/20/2015	5/8/2015	5	15	
6	Columns	Building Construction	5/11/2015	5/29/2015	5	15	
7	Falsework	Building Construction	6/1/2015	6/5/2015	5	5	
8	Stem & Sofit	Building Construction	6/8/2015	6/26/2015	5	15	
9	Deck	Building Construction	6/29/2015	7/17/2015	5	15	
10	Post-tension Bridge	Building Construction	7/20/2015	7/24/2015	5	5	
11	Remove Falsework	Building Construction	7/27/2015	7/31/2015	5	5	
12	Remove Trestle	Building Construction	8/3/2015	8/7/2015	5	5	
13	Paving	Paving	8/10/2015	8/28/2015	5	15	
14	Bridge and Roadway Demolition	Demolition	8/31/2015	9/11/2015	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Clearing and Grubing	Rubber Tired Dozers	3	8.00	255	0.40
Clearing and Grubing	Tractors/Loaders/Backhoes	4	8.00	97	0.37
grading of mitigation site	Excavators	0	8.00	162	0.38
grading of mitigation site	Graders	1	8.00	174	0.41

grading of mitigation site	Rubber Tired Dozers	1	8.00	255	0.40
grading of mitigation site	Scrapers	2	8.00	361	0.48
grading of mitigation site	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading N & S roadway	Excavators	0	8.00	162	0.38
Grading N & S roadway	Graders	1	8.00	174	0.41
Grading N & S roadway	Rubber Tired Dozers	1	8.00	255	0.40
Grading N & S roadway	Scrapers	2	8.00	361	0.48
Grading N & S roadway	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Construct Trestle	Cranes	1	7.00	226	0.29
Construct Trestle	Forklifts	3	8.00	89	0.20
Construct Trestle	Generator Sets	1	8.00	84	0.74
Construct Trestle	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Construct Trestle	Welders	1	8.00	46	0.45
Drill Piles	Cranes	1	7.00	226	0.29
Drill Piles	Forklifts	2	8.00	89	0.20
Drill Piles	Generator Sets	1	8.00	84	0.74
Drill Piles	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Drill Piles	Welders	0	8.00	46	0.45
Columns	Cement and Mortar Mixers	2	7.00	97	0.37
Columns	Cranes	1	7.00	226	0.29
Columns	Forklifts	3	8.00	89	0.20
Columns	Generator Sets	1	8.00	84	0.74
Columns	Welders	1	8.00	46	0.45
Falsework	Cranes	1	7.00	226	0.29
Falsework	Forklifts	3	8.00	89	0.20
Falsework	Generator Sets	1	8.00	84	0.74
Falsework	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Falsework	Welders	1	8.00	46	0.45

Stem & Sofit	Cement and Mortar Mixers	2	7.00	97	0.37
Stem & Sofit	Cranes	1	7.00	226	0.29
Stem & Sofit	Forklifts	2	8.00	89	0.20
Stem & Sofit	Generator Sets	1	8.00	84	0.74
Stem & Sofit	Welders	1	8.00	46	0.45
Deck	Cement and Mortar Mixers	3	7.00	97	0.37
Deck	Cranes	1	7.00	226	0.29
Deck	Forklifts	3	8.00	89	0.20
Deck	Generator Sets	1	8.00	84	0.74
Deck	Welders	1	8.00	46	0.45
Post-tension Bridge	Cranes	1	7.00	226	0.29
Post-tension Bridge	Forklifts	3	8.00	89	0.20
Post-tension Bridge	Generator Sets	1	8.00	84	0.74
Post-tension Bridge	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Post-tension Bridge	Welders	1	8.00	46	0.45
Remove Falsework	Cranes	1	7.00	226	0.29
Remove Falsework	Forklifts	3	8.00	89	0.20
Remove Falsework	Generator Sets	1	8.00	84	0.74
Remove Falsework	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Remove Falsework	Welders	0	8.00	46	0.45
Remove Trestle	Cranes	1	7.00	226	0.29
Remove Trestle	Forklifts	3	8.00	89	0.20
Remove Trestle	Generator Sets	1	8.00	84	0.74
Remove Trestle	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Remove Trestle	Welders	0	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38

Bridge and Roadway Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Bridge and Roadway Demolition	Excavators	1	8.00	162	0.38
Bridge and Roadway Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Columns	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Stem & Sofit	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Deck	Tractors/Loaders/Backhoes	3	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Clearing and Grubing	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
grading of mitigation site	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading N & S roadway	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Construct Trestle	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Drill Piles	6	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Columns	11	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Falsework	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Stem & Sofit	10	38.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Deck	12	38.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Post-tension Bridge	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Falsework	7	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Trestle	7	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	38.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bridge and Roadway Demolition	3	15.00	0.00	36.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Clearing and Grubing - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1536	0.0000	0.1536	0.0844	0.0000	0.0844	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0447	0.4836	0.3624	3.3000e-004		0.0263	0.0263		0.0242	0.0242	0.0000	31.7060	31.7060	9.4700e-003	0.0000	31.9047
Total	**0.0447**	**0.4836**	**0.3624**	**3.3000e-004**	**0.1536**	**0.0263**	**0.1798**	**0.0844**	**0.0242**	**0.1086**	**0.0000**	**31.7060**	**31.7060**	**9.4700e-003**	**0.0000**	**31.9047**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8000e-004	7.6000e-004	7.3200e-003	2.0000e-005	1.2300e-003	1.0000e-005	1.2400e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.1849	1.1849	7.0000e-005	0.0000	1.1862
Total	**5.8000e-004**	**7.6000e-004**	**7.3200e-003**	**2.0000e-005**	**1.2300e-003**	**1.0000e-005**	**1.2400e-003**	**3.3000e-004**	**1.0000e-005**	**3.4000e-004**	**0.0000**	**1.1849**	**1.1849**	**7.0000e-005**	**0.0000**	**1.1862**

3.2 Clearing and Grubing - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0691	0.0000	0.0691	0.0380	0.0000	0.0380	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8300e-003	0.2618	0.1727	3.3000e-004		5.1800e-003	5.1800e-003		5.5300e-003	5.5300e-003	0.0000	31.7059	31.7059	9.4700e-003	0.0000	31.9047
Total	**4.8300e-003**	**0.2618**	**0.1727**	**3.3000e-004**	**0.0691**	**5.1800e-003**	**0.0743**	**0.0380**	**5.5300e-003**	**0.0435**	**0.0000**	**31.7059**	**31.7059**	**9.4700e-003**	**0.0000**	**31.9047**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8000e-004	7.6000e-004	7.3200e-003	2.0000e-005	1.2300e-003	1.0000e-005	1.2400e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.1849	1.1849	7.0000e-005	0.0000	1.1862
Total	**5.8000e-004**	**7.6000e-004**	**7.3200e-003**	**2.0000e-005**	**1.2300e-003**	**1.0000e-005**	**1.2400e-003**	**3.3000e-004**	**1.0000e-005**	**3.4000e-004**	**0.0000**	**1.1849**	**1.1849**	**7.0000e-005**	**0.0000**	**1.1862**

3.3 grading of mitigation site - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0428	0.0000	0.0428	0.0179	0.0000	0.0179	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0297	0.3466	0.2198	2.6000e-004		0.0166	0.0166		0.0153	0.0153	0.0000	24.3812	24.3812	7.2800e-003	0.0000	24.5341
Total	**0.0297**	**0.3466**	**0.2198**	**2.6000e-004**	**0.0428**	**0.0166**	**0.0595**	**0.0179**	**0.0153**	**0.0332**	**0.0000**	**24.3812**	**24.3812**	**7.2800e-003**	**0.0000**	**24.5341**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	3.7000e-004	3.5900e-003	1.0000e-005	6.0000e-004	0.0000	6.1000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5808	0.5808	3.0000e-005	0.0000	0.5815
Total	**2.8000e-004**	**3.7000e-004**	**3.5900e-003**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**6.1000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5808**	**0.5808**	**3.0000e-005**	**0.0000**	**0.5815**

3.3 grading of mitigation site - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0193	0.0000	0.0193	8.0700e-003	0.0000	8.0700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.1700e-003	0.2032	0.1444	2.6000e-004		4.8300e-003	4.8300e-003		4.9100e-003	4.9100e-003	0.0000	24.3812	24.3812	7.2800e-003	0.0000	24.5340
Total	**6.1700e-003**	**0.2032**	**0.1444**	**2.6000e-004**	**0.0193**	**4.8300e-003**	**0.0241**	**8.0700e-003**	**4.9100e-003**	**0.0130**	**0.0000**	**24.3812**	**24.3812**	**7.2800e-003**	**0.0000**	**24.5340**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	3.7000e-004	3.5900e-003	1.0000e-005	6.0000e-004	0.0000	6.1000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5808	0.5808	3.0000e-005	0.0000	0.5815
Total	**2.8000e-004**	**3.7000e-004**	**3.5900e-003**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**6.1000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5808**	**0.5808**	**3.0000e-005**	**0.0000**	**0.5815**

3.4 Grading N & S roadway - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1714	0.0000	0.1714	0.0918	0.0000	0.0918	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1634	1.9062	1.2089	1.4100e-003		0.0914	0.0914		0.0840	0.0840	0.0000	134.0966	134.0966	0.0400	0.0000	134.9373
Total	**0.1634**	**1.9062**	**1.2089**	**1.4100e-003**	**0.1714**	**0.0914**	**0.2627**	**0.0918**	**0.0840**	**0.1759**	**0.0000**	**134.0966**	**134.0966**	**0.0400**	**0.0000**	**134.9373**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5600e-003	2.0600e-003	0.0198	4.0000e-005	3.3100e-003	3.0000e-005	3.3300e-003	8.8000e-004	2.0000e-005	9.0000e-004	0.0000	3.1945	3.1945	1.8000e-004	0.0000	3.1982
Total	**1.5600e-003**	**2.0600e-003**	**0.0198**	**4.0000e-005**	**3.3100e-003**	**3.0000e-005**	**3.3300e-003**	**8.8000e-004**	**2.0000e-005**	**9.0000e-004**	**0.0000**	**3.1945**	**3.1945**	**1.8000e-004**	**0.0000**	**3.1982**

3.4 Grading N & S roadway - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0771	0.0000	0.0771	0.0413	0.0000	0.0413	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0339	1.1174	0.7940	1.4100e-003		0.0266	0.0266		0.0270	0.0270	0.0000	134.0964	134.0964	0.0400	0.0000	134.9371
Total	**0.0339**	**1.1174**	**0.7940**	**1.4100e-003**	**0.0771**	**0.0266**	**0.1037**	**0.0413**	**0.0270**	**0.0683**	**0.0000**	**134.0964**	**134.0964**	**0.0400**	**0.0000**	**134.9371**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5600e-003	2.0600e-003	0.0198	4.0000e-005	3.3100e-003	3.0000e-005	3.3300e-003	8.8000e-004	2.0000e-005	9.0000e-004	0.0000	3.1945	3.1945	1.8000e-004	0.0000	3.1982
Total	**1.5600e-003**	**2.0600e-003**	**0.0198**	**4.0000e-005**	**3.3100e-003**	**3.0000e-005**	**3.3300e-003**	**8.8000e-004**	**2.0000e-005**	**9.0000e-004**	**0.0000**	**3.1945**	**3.1945**	**1.8000e-004**	**0.0000**	**3.1982**

3.5 Construct Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0751	0.0469	7.0000e-005		5.2900e-003	5.2900e-003		4.9800e-003	4.9800e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**9.1500e-003**	**0.0751**	**0.0469**	**7.0000e-005**		**5.2900e-003**	**5.2900e-003**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.5 Construct Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.0600e-003	0.0560	0.0434	7.0000e-005		1.7000e-003	1.7000e-003		1.7500e-003	1.7500e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**1.0600e-003**	**0.0560**	**0.0434**	**7.0000e-005**		**1.7000e-003**	**1.7000e-003**		**1.7500e-003**	**1.7500e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.6 Drill Piles - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0186	0.1732	0.0999	1.5000e-004		0.0116	0.0116		0.0109	0.0109	0.0000	13.8471	13.8471	3.3000e-003	0.0000	13.9165
Total	**0.0186**	**0.1732**	**0.0999**	**1.5000e-004**		**0.0116**	**0.0116**		**0.0109**	**0.0109**	**0.0000**	**13.8471**	**13.8471**	**3.3000e-003**	**0.0000**	**13.9165**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.1000e-004	9.4000e-004	8.9800e-003	2.0000e-005	1.5000e-003	1.0000e-005	1.5200e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.4520	1.4520	8.0000e-005	0.0000	1.4537
Total	**7.1000e-004**	**9.4000e-004**	**8.9800e-003**	**2.0000e-005**	**1.5000e-003**	**1.0000e-005**	**1.5200e-003**	**4.0000e-004**	**1.0000e-005**	**4.1000e-004**	**0.0000**	**1.4520**	**1.4520**	**8.0000e-005**	**0.0000**	**1.4537**

3.6 Drill Piles - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.9600e-003	0.1267	0.0979	1.5000e-004		3.7000e-003	3.7000e-003		3.8200e-003	3.8200e-003	0.0000	13.8471	13.8471	3.3000e-003	0.0000	13.9164
Total	**3.9600e-003**	**0.1267**	**0.0979**	**1.5000e-004**		**3.7000e-003**	**3.7000e-003**		**3.8200e-003**	**3.8200e-003**	**0.0000**	**13.8471**	**13.8471**	**3.3000e-003**	**0.0000**	**13.9164**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.1000e-004	9.4000e-004	8.9800e-003	2.0000e-005	1.5000e-003	1.0000e-005	1.5200e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.4520	1.4520	8.0000e-005	0.0000	1.4537
Total	**7.1000e-004**	**9.4000e-004**	**8.9800e-003**	**2.0000e-005**	**1.5000e-003**	**1.0000e-005**	**1.5200e-003**	**4.0000e-004**	**1.0000e-005**	**4.1000e-004**	**0.0000**	**1.4520**	**1.4520**	**8.0000e-005**	**0.0000**	**1.4537**

3.7 Columns - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0274	0.2252	0.1406	2.0000e-004		0.0159	0.0159		0.0149	0.0149	0.0000	18.2996	18.2996	4.5900e-003	0.0000	18.3960
Total	**0.0274**	**0.2252**	**0.1406**	**2.0000e-004**		**0.0159**	**0.0159**		**0.0149**	**0.0149**	**0.0000**	**18.2996**	**18.2996**	**4.5900e-003**	**0.0000**	**18.3960**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	5.6000e-004	5.3900e-003	1.0000e-005	9.0000e-004	1.0000e-005	9.1000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.8712	0.8712	5.0000e-005	0.0000	0.8722
Total	**4.2000e-004**	**5.6000e-004**	**5.3900e-003**	**1.0000e-005**	**9.0000e-004**	**1.0000e-005**	**9.1000e-004**	**2.4000e-004**	**1.0000e-005**	**2.5000e-004**	**0.0000**	**0.8712**	**0.8712**	**5.0000e-005**	**0.0000**	**0.8722**

3.7 Columns - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.1700e-003	0.1681	0.1303	2.0000e-004		5.1000e-003	5.1000e-003		5.2600e-003	5.2600e-003	0.0000	18.2996	18.2996	4.5900e-003	0.0000	18.3960
Total	**3.1700e-003**	**0.1681**	**0.1303**	**2.0000e-004**		**5.1000e-003**	**5.1000e-003**		**5.2600e-003**	**5.2600e-003**	**0.0000**	**18.2996**	**18.2996**	**4.5900e-003**	**0.0000**	**18.3960**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	5.6000e-004	5.3900e-003	1.0000e-005	9.0000e-004	1.0000e-005	9.1000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.8712	0.8712	5.0000e-005	0.0000	0.8722
Total	**4.2000e-004**	**5.6000e-004**	**5.3900e-003**	**1.0000e-005**	**9.0000e-004**	**1.0000e-005**	**9.1000e-004**	**2.4000e-004**	**1.0000e-005**	**2.5000e-004**	**0.0000**	**0.8712**	**0.8712**	**5.0000e-005**	**0.0000**	**0.8722**

3.8 Falsework - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0751	0.0469	7.0000e-005		5.2900e-003	5.2900e-003		4.9800e-003	4.9800e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**9.1500e-003**	**0.0751**	**0.0469**	**7.0000e-005**		**5.2900e-003**	**5.2900e-003**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.8 Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.0600e-003	0.0560	0.0434	7.0000e-005		1.7000e-003	1.7000e-003		1.7500e-003	1.7500e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**1.0600e-003**	**0.0560**	**0.0434**	**7.0000e-005**		**1.7000e-003**	**1.7000e-003**		**1.7500e-003**	**1.7500e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.9 Stem & Sofit - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0256	0.2097	0.1310	1.9000e-004		0.0146	0.0146		0.0137	0.0137	0.0000	17.2085	17.2085	4.2700e-003	0.0000	17.2980
Total	**0.0256**	**0.2097**	**0.1310**	**1.9000e-004**		**0.0146**	**0.0146**		**0.0137**	**0.0137**	**0.0000**	**17.2085**	**17.2085**	**4.2700e-003**	**0.0000**	**17.2980**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	1.4200e-003	0.0136	3.0000e-005	2.2900e-003	2.0000e-005	2.3000e-003	6.1000e-004	2.0000e-005	6.2000e-004	0.0000	2.2071	2.2071	1.2000e-004	0.0000	2.2097
Total	**1.0700e-003**	**1.4200e-003**	**0.0136**	**3.0000e-005**	**2.2900e-003**	**2.0000e-005**	**2.3000e-003**	**6.1000e-004**	**2.0000e-005**	**6.2000e-004**	**0.0000**	**2.2071**	**2.2071**	**1.2000e-004**	**0.0000**	**2.2097**

3.9 Stem & Sofit - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.8800e-003	0.1577	0.1218	1.9000e-004		4.8200e-003	4.8200e-003		4.9600e-003	4.9600e-003	0.0000	17.2084	17.2084	4.2700e-003	0.0000	17.2980
Total	**2.8800e-003**	**0.1577**	**0.1218**	**1.9000e-004**		**4.8200e-003**	**4.8200e-003**		**4.9600e-003**	**4.9600e-003**	**0.0000**	**17.2084**	**17.2084**	**4.2700e-003**	**0.0000**	**17.2980**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	1.4200e-003	0.0136	3.0000e-005	2.2900e-003	2.0000e-005	2.3000e-003	6.1000e-004	2.0000e-005	6.2000e-004	0.0000	2.2071	2.2071	1.2000e-004	0.0000	2.2097
Total	**1.0700e-003**	**1.4200e-003**	**0.0136**	**3.0000e-005**	**2.2900e-003**	**2.0000e-005**	**2.3000e-003**	**6.1000e-004**	**2.0000e-005**	**6.2000e-004**	**0.0000**	**2.2071**	**2.2071**	**1.2000e-004**	**0.0000**	**2.2097**

3.10 Deck - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0274	0.2252	0.1406	2.0000e-004		0.0159	0.0159		0.0149	0.0149	0.0000	18.2996	18.2996	4.5900e-003	0.0000	18.3960
Total	**0.0274**	**0.2252**	**0.1406**	**2.0000e-004**		**0.0159**	**0.0159**		**0.0149**	**0.0149**	**0.0000**	**18.2996**	**18.2996**	**4.5900e-003**	**0.0000**	**18.3960**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	1.4200e-003	0.0136	3.0000e-005	2.2900e-003	2.0000e-005	2.3000e-003	6.1000e-004	2.0000e-005	6.2000e-004	0.0000	2.2071	2.2071	1.2000e-004	0.0000	2.2097
Total	**1.0700e-003**	**1.4200e-003**	**0.0136**	**3.0000e-005**	**2.2900e-003**	**2.0000e-005**	**2.3000e-003**	**6.1000e-004**	**2.0000e-005**	**6.2000e-004**	**0.0000**	**2.2071**	**2.2071**	**1.2000e-004**	**0.0000**	**2.2097**

3.10 Deck - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.1700e-003	0.1681	0.1303	2.0000e-004		5.1000e-003	5.1000e-003		5.2600e-003	5.2600e-003	0.0000	18.2996	18.2996	4.5900e-003	0.0000	18.3960
Total	**3.1700e-003**	**0.1681**	**0.1303**	**2.0000e-004**		**5.1000e-003**	**5.1000e-003**		**5.2600e-003**	**5.2600e-003**	**0.0000**	**18.2996**	**18.2996**	**4.5900e-003**	**0.0000**	**18.3960**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	1.4200e-003	0.0136	3.0000e-005	2.2900e-003	2.0000e-005	2.3000e-003	6.1000e-004	2.0000e-005	6.2000e-004	0.0000	2.2071	2.2071	1.2000e-004	0.0000	2.2097
Total	**1.0700e-003**	**1.4200e-003**	**0.0136**	**3.0000e-005**	**2.2900e-003**	**2.0000e-005**	**2.3000e-003**	**6.1000e-004**	**2.0000e-005**	**6.2000e-004**	**0.0000**	**2.2071**	**2.2071**	**1.2000e-004**	**0.0000**	**2.2097**

3.11 Post-tension Bridge - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0751	0.0469	7.0000e-005		5.2900e-003	5.2900e-003		4.9800e-003	4.9800e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**9.1500e-003**	**0.0751**	**0.0469**	**7.0000e-005**		**5.2900e-003**	**5.2900e-003**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.11 Post-tension Bridge - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.0600e-003	0.0560	0.0434	7.0000e-005		1.7000e-003	1.7000e-003		1.7500e-003	1.7500e-003	0.0000	6.0999	6.0999	1.5300e-003	0.0000	6.1320
Total	**1.0600e-003**	**0.0560**	**0.0434**	**7.0000e-005**		**1.7000e-003**	**1.7000e-003**		**1.7500e-003**	**1.7500e-003**	**0.0000**	**6.0999**	**6.0999**	**1.5300e-003**	**0.0000**	**6.1320**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.12 Remove Falsework - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.7900e-003	0.0629	0.0365	5.0000e-005		4.3100e-003	4.3100e-003		4.0400e-003	4.0400e-003	0.0000	4.9794	4.9794	1.2100e-003	0.0000	5.0048
Total	**6.7900e-003**	**0.0629**	**0.0365**	**5.0000e-005**		**4.3100e-003**	**4.3100e-003**		**4.0400e-003**	**4.0400e-003**	**0.0000**	**4.9794**	**4.9794**	**1.2100e-003**	**0.0000**	**5.0048**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.12 Remove Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4200e-003	0.0457	0.0355	5.0000e-005		1.3300e-003	1.3300e-003		1.3700e-003	1.3700e-003	0.0000	4.9794	4.9794	1.2100e-003	0.0000	5.0048
Total	**1.4200e-003**	**0.0457**	**0.0355**	**5.0000e-005**		**1.3300e-003**	**1.3300e-003**		**1.3700e-003**	**1.3700e-003**	**0.0000**	**4.9794**	**4.9794**	**1.2100e-003**	**0.0000**	**5.0048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.13 Remove Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.7900e-003	0.0629	0.0365	5.0000e-005		4.3100e-003	4.3100e-003		4.0400e-003	4.0400e-003	0.0000	4.9794	4.9794	1.2100e-003	0.0000	5.0048
Total	**6.7900e-003**	**0.0629**	**0.0365**	**5.0000e-005**		**4.3100e-003**	**4.3100e-003**		**4.0400e-003**	**4.0400e-003**	**0.0000**	**4.9794**	**4.9794**	**1.2100e-003**	**0.0000**	**5.0048**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.13 Remove Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4200e-003	0.0457	0.0355	5.0000e-005		1.3300e-003	1.3300e-003		1.3700e-003	1.3700e-003	0.0000	4.9794	4.9794	1.2100e-003	0.0000	5.0048
Total	**1.4200e-003**	**0.0457**	**0.0355**	**5.0000e-005**		**1.3300e-003**	**1.3300e-003**		**1.3700e-003**	**1.3700e-003**	**0.0000**	**4.9794**	**4.9794**	**1.2100e-003**	**0.0000**	**5.0048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8000e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2904	0.2904	2.0000e-005	0.0000	0.2908
Total	**1.4000e-004**	**1.9000e-004**	**1.8000e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2904**	**0.2904**	**2.0000e-005**	**0.0000**	**0.2908**

3.14 Paving - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0174	0.1888	0.1123	1.7000e-004		0.0106	0.0106		9.7600e-003	9.7600e-003	0.0000	15.9204	15.9204	4.7500e-003	0.0000	16.0202
Paving	5.2400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0226**	**0.1888**	**0.1123**	**1.7000e-004**		**0.0106**	**0.0106**		**9.7600e-003**	**9.7600e-003**	**0.0000**	**15.9204**	**15.9204**	**4.7500e-003**	**0.0000**	**16.0202**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	1.4200e-003	0.0136	3.0000e-005	2.2900e-003	2.0000e-005	2.3000e-003	6.1000e-004	2.0000e-005	6.2000e-004	0.0000	2.2071	2.2071	1.2000e-004	0.0000	2.2097
Total	**1.0700e-003**	**1.4200e-003**	**0.0136**	**3.0000e-005**	**2.2900e-003**	**2.0000e-005**	**2.3000e-003**	**6.1000e-004**	**2.0000e-005**	**6.2000e-004**	**0.0000**	**2.2071**	**2.2071**	**1.2000e-004**	**0.0000**	**2.2097**

3.14 Paving - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.8400e-003	0.1478	0.1270	1.7000e-004		4.9100e-003	4.9100e-003		4.9100e-003	4.9100e-003	0.0000	15.9204	15.9204	4.7500e-003	0.0000	16.0202
Paving	5.2400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0121**	**0.1478**	**0.1270**	**1.7000e-004**		**4.9100e-003**	**4.9100e-003**		**4.9100e-003**	**4.9100e-003**	**0.0000**	**15.9204**	**15.9204**	**4.7500e-003**	**0.0000**	**16.0202**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	1.4200e-003	0.0136	3.0000e-005	2.2900e-003	2.0000e-005	2.3000e-003	6.1000e-004	2.0000e-005	6.2000e-004	0.0000	2.2071	2.2071	1.2000e-004	0.0000	2.2097
Total	**1.0700e-003**	**1.4200e-003**	**0.0136**	**3.0000e-005**	**2.2900e-003**	**2.0000e-005**	**2.3000e-003**	**6.1000e-004**	**2.0000e-005**	**6.2000e-004**	**0.0000**	**2.2071**	**2.2071**	**1.2000e-004**	**0.0000**	**2.2097**

3.15 Bridge and Roadway Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.9000e-003	0.0000	3.9000e-003	5.9000e-004	0.0000	5.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0120	0.1212	0.0911	1.0000e-004		6.5000e-003	6.5000e-003		6.1300e-003	6.1300e-003	0.0000	9.4445	9.4445	2.3100e-003	0.0000	9.4929
Total	**0.0120**	**0.1212**	**0.0911**	**1.0000e-004**	**3.9000e-003**	**6.5000e-003**	**0.0104**	**5.9000e-004**	**6.1300e-003**	**6.7200e-003**	**0.0000**	**9.4445**	**9.4445**	**2.3100e-003**	**0.0000**	**9.4929**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.3000e-004	6.0900e-003	4.6700e-003	1.0000e-005	3.1000e-004	9.0000e-005	4.0000e-004	8.0000e-005	8.0000e-005	1.7000e-004	0.0000	1.2443	1.2443	1.0000e-005	0.0000	1.2445
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	3.7000e-004	3.5900e-003	1.0000e-005	6.0000e-004	0.0000	6.1000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5808	0.5808	3.0000e-005	0.0000	0.5815
Total	**7.1000e-004**	**6.4600e-003**	**8.2600e-003**	**2.0000e-005**	**9.1000e-004**	**9.0000e-005**	**1.0100e-003**	**2.4000e-004**	**8.0000e-005**	**3.3000e-004**	**0.0000**	**1.8251**	**1.8251**	**4.0000e-005**	**0.0000**	**1.8260**

3.15 Bridge and Roadway Demolition - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.7500e-003	0.0000	1.7500e-003	2.7000e-004	0.0000	2.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.6000e-004	0.0758	0.0635	1.0000e-004		1.0700e-003	1.0700e-003		1.3000e-003	1.3000e-003	0.0000	9.4445	9.4445	2.3100e-003	0.0000	9.4929
Total	**3.6000e-004**	**0.0758**	**0.0635**	**1.0000e-004**	**1.7500e-003**	**1.0700e-003**	**2.8200e-003**	**2.7000e-004**	**1.3000e-003**	**1.5700e-003**	**0.0000**	**9.4445**	**9.4445**	**2.3100e-003**	**0.0000**	**9.4929**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.3000e-004	6.0900e-003	4.6700e-003	1.0000e-005	3.1000e-004	9.0000e-005	4.0000e-004	8.0000e-005	8.0000e-005	1.7000e-004	0.0000	1.2443	1.2443	1.0000e-005	0.0000	1.2445
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	3.7000e-004	3.5900e-003	1.0000e-005	6.0000e-004	0.0000	6.1000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5808	0.5808	3.0000e-005	0.0000	0.5815
Total	**7.1000e-004**	**6.4600e-003**	**8.2600e-003**	**2.0000e-005**	**9.1000e-004**	**9.0000e-005**	**1.0100e-003**	**2.4000e-004**	**8.0000e-005**	**3.3000e-004**	**0.0000**	**1.8251**	**1.8251**	**4.0000e-005**	**0.0000**	**1.8260**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509603	0.073619	0.192430	0.134105	0.036943	0.005309	0.012459	0.020989	0.001832	0.002087	0.006541	0.000614	0.003471

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004
Unmitigated	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004
Total	**3.0000e-005**	**0.0000**	**2.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**0.0000**	**5.3000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	2.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-004	5.0000e-004	0.0000	0.0000	5.3000e-004
Total	**3.0000e-005**	**0.0000**	**2.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**0.0000**	**5.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Summer

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4256-1 Eastern

San Diego County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	4.00	Acre	4.00	0.00	0
Other Non-Asphalt Surfaces	24.00	Acre	24.00	0.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2015

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Roadway only, no buildings

Construction Phase - per contractor

Off-road Equipment - per contractor

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Off-road Equipment -

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Off-road Equipment -

Off-road Equipment - Per Contractor

Off-road Equipment - per contractor

Off-road Equipment - Per Contractor

Off-road Equipment -

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Trips and VMT - Default indicated no worker trips on some phases, trips added

On-road Fugitive Dust -

Grading - Per Contractor

Vechicle Emission Factors -

Vechicle Emission Factors -

Vechicle Emission Factors -

Construction Off-road Equipment Mitigation - Regulatory Compliance

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	30.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	38.00
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tblConstructionPhase	PhaseEndDate	2/6/2015	1/14/2015
tblConstructionPhase	PhaseEndDate	4/1/2015	4/10/2015
tblConstructionPhase	PhaseStartDate	7/18/2015	7/20/2015
tblConstructionPhase	PhaseStartDate	7/25/2015	7/27/2015
tblConstructionPhase	PhaseStartDate	8/1/2015	8/3/2015
tblConstructionPhase	PhaseStartDate	4/11/2015	4/13/2015
tblConstructionPhase	PhaseStartDate	4/18/2015	4/20/2015
tblConstructionPhase	PhaseStartDate	5/9/2015	5/11/2015
tblConstructionPhase	PhaseStartDate	5/30/2015	6/1/2015
tblConstructionPhase	PhaseStartDate	6/6/2015	6/8/2015
tblConstructionPhase	PhaseStartDate	6/27/2015	6/29/2015
tblConstructionPhase	PhaseStartDate	8/29/2015	8/31/2015
tblConstructionPhase	PhaseStartDate	1/24/2015	1/1/2015
tblConstructionPhase	PhaseStartDate	1/15/2015	1/26/2015
tblConstructionPhase	PhaseStartDate	8/8/2015	8/10/2015
tblGrading	AcresOfGrading	25.00	24.00
tblGrading	AcresOfGrading	137.50	4.00
tblGrading	MaterialImported	0.00	51,600.00

tblLandUse	LandUseSquareFeet	174,240.00	0.00
tblLandUse	LandUseSquareFeet	1,045,440.00	0.00
tblOffRoadEquipment	HorsePower	9.00	97.00
tblOffRoadEquipment	HorsePower	9.00	97.00
tblOffRoadEquipment	HorsePower	9.00	97.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblTripsAndVMT	WorkerTripNumber	0.00	15.00
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tblTripsAndVMT	WorkerTripNumber	8.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00

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tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	11.3294	126.3558	88.2249	0.0937	26.9046	6.4123	33.3170	13.5876	5.8994	19.4870	0.0000	9,783.8803	9,783.8803	2.8478	0.0000	9,843.6840
Total	**11.3294**	**126.3558**	**88.2249**	**0.0937**	**26.9046**	**6.4123**	**33.3170**	**13.5876**	**5.8994**	**19.4870**	**0.0000**	**9,783.8803**	**9,783.8803**	**2.8478**	**0.0000**	**9,843.6840**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	1.9275	71.5756	50.8190	0.0937	12.2562	1.5764	13.8325	6.1540	1.6338	7.7877	0.0000	9,783.8803	9,783.8803	2.8478	0.0000	9,843.6840
Total	**1.9275**	**71.5756**	**50.8190**	**0.0937**	**12.2562**	**1.5764**	**13.8325**	**6.1540**	**1.6338**	**7.7877**	**0.0000**	**9,783.8803**	**9,783.8803**	**2.8478**	**0.0000**	**9,843.6840**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**82.99**	**43.35**	**42.40**	**0.00**	**54.45**	**75.42**	**58.48**	**54.71**	**72.31**	**60.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**	**0.0000**	**6.5000e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**	**0.0000**	**6.5000e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Clearing and Grubing	Site Preparation	1/1/2015	1/23/2015	5	17	
2	grading of mitigation site	Grading	1/1/2015	1/14/2015	5	10	
3	Grading N & S roadway	Grading	1/26/2015	4/10/2015	5	55	
4	Construct Trestle	Building Construction	4/13/2015	4/17/2015	5	5	
5	Drill Piles	Building Construction	4/20/2015	5/8/2015	5	15	
6	Columns	Building Construction	5/11/2015	5/29/2015	5	15	
7	Falsework	Building Construction	6/1/2015	6/5/2015	5	5	
8	Stem & Sofit	Building Construction	6/8/2015	6/26/2015	5	15	
9	Deck	Building Construction	6/29/2015	7/17/2015	5	15	
10	Post-tension Bridge	Building Construction	7/20/2015	7/24/2015	5	5	
11	Remove Falsework	Building Construction	7/27/2015	7/31/2015	5	5	
12	Remove Trestle	Building Construction	8/3/2015	8/7/2015	5	5	
13	Paving	Paving	8/10/2015	8/28/2015	5	15	
14	Bridge and Roadway Demolition	Demolition	8/31/2015	9/11/2015	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Clearing and Grubing	Rubber Tired Dozers	3	8.00	255	0.40
Clearing and Grubing	Tractors/Loaders/Backhoes	4	8.00	97	0.37
grading of mitigation site	Excavators	0	8.00	162	0.38
grading of mitigation site	Graders	1	8.00	174	0.41
grading of mitigation site	Rubber Tired Dozers	1	8.00	255	0.40
grading of mitigation site	Scrapers	2	8.00	361	0.48
grading of mitigation site	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading N & S roadway	Excavators	0	8.00	162	0.38
Grading N & S roadway	Graders	1	8.00	174	0.41
Grading N & S roadway	Rubber Tired Dozers	1	8.00	255	0.40
Grading N & S roadway	Scrapers	2	8.00	361	0.48
Grading N & S roadway	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Construct Trestle	Cranes	1	7.00	226	0.29
Construct Trestle	Forklifts	3	8.00	89	0.20
Construct Trestle	Generator Sets	1	8.00	84	0.74
Construct Trestle	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Construct Trestle	Welders	1	8.00	46	0.45
Drill Piles	Cranes	1	7.00	226	0.29
Drill Piles	Forklifts	2	8.00	89	0.20
Drill Piles	Generator Sets	1	8.00	84	0.74
Drill Piles	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Drill Piles	Welders	0	8.00	46	0.45
Columns	Cement and Mortar Mixers	2	7.00	97	0.37
Columns	Cranes	1	7.00	226	0.29
Columns	Forklifts	3	8.00	89	0.20

Columns	Generator Sets	1	8.00	84	0.74
Columns	Welders	1	8.00	46	0.45
Falsework	Cranes	1	7.00	226	0.29
Falsework	Forklifts	3	8.00	89	0.20
Falsework	Generator Sets	1	8.00	84	0.74
Falsework	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Falsework	Welders	1	8.00	46	0.45
Stem & Sofit	Cement and Mortar Mixers	2	7.00	97	0.37
Stem & Sofit	Cranes	1	7.00	226	0.29
Stem & Sofit	Forklifts	2	8.00	89	0.20
Stem & Sofit	Generator Sets	1	8.00	84	0.74
Stem & Sofit	Welders	1	8.00	46	0.45
Deck	Cement and Mortar Mixers	3	7.00	97	0.37
Deck	Cranes	1	7.00	226	0.29
Deck	Forklifts	3	8.00	89	0.20
Deck	Generator Sets	1	8.00	84	0.74
Deck	Welders	1	8.00	46	0.45
Post-tension Bridge	Cranes	1	7.00	226	0.29
Post-tension Bridge	Forklifts	3	8.00	89	0.20
Post-tension Bridge	Generator Sets	1	8.00	84	0.74
Post-tension Bridge	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Post-tension Bridge	Welders	1	8.00	46	0.45
Remove Falsework	Cranes	1	7.00	226	0.29
Remove Falsework	Forklifts	3	8.00	89	0.20
Remove Falsework	Generator Sets	1	8.00	84	0.74
Remove Falsework	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Remove Falsework	Welders	0	8.00	46	0.45
Remove Trestle	Cranes	1	7.00	226	0.29

Remove Trestle	Forklifts	3	8.00	89	0.20
Remove Trestle	Generator Sets	1	8.00	84	0.74
Remove Trestle	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Remove Trestle	Welders	0	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Bridge and Roadway Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Bridge and Roadway Demolition	Excavators	1	8.00	162	0.38
Bridge and Roadway Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Columns	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Stem & Sofit	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Deck	Tractors/Loaders/Backhoes	3	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Clearing and Grubing	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
grading of mitigation site	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading N & S roadway	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Construct Trestle	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Drill Piles	6	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Columns	11	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Falsework	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Stem & Sofit	10	38.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Deck	12	38.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Post-tension Bridge	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Falsework	7	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Trestle	7	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	38.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bridge and Roadway Demolition	3	15.00	0.00	36.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Clearing and Grubing - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412		4,111.7444	4,111.7444	1.2275		4,137.5225
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**		**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5225**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0690	0.0814	0.8900	1.8700e-003	0.1479	1.1600e-003	0.1490	0.0392	1.0600e-003	0.0403		162.0015	162.0015	8.4900e-003		162.1798
Total	**0.0690**	**0.0814**	**0.8900**	**1.8700e-003**	**0.1479**	**1.1600e-003**	**0.1490**	**0.0392**	**1.0600e-003**	**0.0403**		**162.0015**	**162.0015**	**8.4900e-003**		**162.1798**

3.2 Clearing and Grubing - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	0.5679	30.7955	20.3165	0.0391		0.6089	0.6089		0.6502	0.6502	0.0000	4,111.7444	4,111.7444	1.2275		4,137.5224
Total	**0.5679**	**30.7955**	**20.3165**	**0.0391**	**8.1298**	**0.6089**	**8.7388**	**4.4688**	**0.6502**	**5.1190**	**0.0000**	**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5224**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0690	0.0814	0.8900	1.8700e-003	0.1479	1.1600e-003	0.1490	0.0392	1.0600e-003	0.0403		162.0015	162.0015	8.4900e-003		162.1798
Total	**0.0690**	**0.0814**	**0.8900**	**1.8700e-003**	**0.1479**	**1.1600e-003**	**0.1490**	**0.0392**	**1.0600e-003**	**0.0403**		**162.0015**	**162.0015**	**8.4900e-003**		**162.1798**

3.3 grading of mitigation site - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.5673	0.0000	8.5673	3.5851	0.0000	3.5851			0.0000			0.0000
Off-Road	5.9420	69.3170	43.9616	0.0512		3.3219	3.3219		3.0562	3.0562		5,375.1332	5,375.1332	1.6047		5,408.8319
Total	**5.9420**	**69.3170**	**43.9616**	**0.0512**	**8.5673**	**3.3219**	**11.8892**	**3.5851**	**3.0562**	**6.6412**		**5,375.1332**	**5,375.1332**	**1.6047**		**5,408.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.3 grading of mitigation site - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.8553	0.0000	3.8553	1.6133	0.0000	1.6133			0.0000			0.0000
Off-Road	1.2331	40.6309	28.8709	0.0512		0.9653	0.9653		0.9816	0.9816	0.0000	5,375.1332	5,375.1332	1.6047		5,408.8319
Total	**1.2331**	**40.6309**	**28.8709**	**0.0512**	**3.8553**	**0.9653**	**4.8206**	**1.6133**	**0.9816**	**2.5949**	**0.0000**	**5,375.1332**	**5,375.1332**	**1.6047**		**5,408.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.4 Grading N & S roadway - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2311	0.0000	6.2311	3.3385	0.0000	3.3385			0.0000			0.0000
Off-Road	5.9420	69.3170	43.9616	0.0512		3.3219	3.3219		3.0562	3.0562		5,375.1332	5,375.1332	1.6047		5,408.8319
Total	**5.9420**	**69.3170**	**43.9616**	**0.0512**	**6.2311**	**3.3219**	**9.5530**	**3.3385**	**3.0562**	**6.3947**		**5,375.1332**	**5,375.1332**	**1.6047**		**5,408.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.4 Grading N & S roadway - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8040	0.0000	2.8040	1.5023	0.0000	1.5023			0.0000			0.0000
Off-Road	1.2331	40.6309	28.8709	0.0512		0.9653	0.9653		0.9816	0.9816	0.0000	5,375.1332	5,375.1332	1.6047		5,408.8319
Total	**1.2331**	**40.6309**	**28.8709**	**0.0512**	**2.8040**	**0.9653**	**3.7693**	**1.5023**	**0.9816**	**2.4839**	**0.0000**	**5,375.1332**	**5,375.1332**	**1.6047**		**5,408.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.5 Construct Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.5 Construct Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4231	22.4070	17.3737	0.0268		0.6800	0.6800		0.7016	0.7016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**0.4231**	**22.4070**	**17.3737**	**0.0268**		**0.6800**	**0.6800**		**0.7016**	**0.7016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.6 Drill Piles - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.4764	23.0879	13.3159	0.0200		1.5506	1.5506		1.4570	1.4570		2,035.1806	2,035.1806	0.4852		2,045.3692
Total	**2.4764**	**23.0879**	**13.3159**	**0.0200**		**1.5506**	**1.5506**		**1.4570**	**1.4570**		**2,035.1806**	**2,035.1806**	**0.4852**		**2,045.3692**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0958	0.1130	1.2361	2.6000e-003	0.2054	1.6100e-003	0.2070	0.0545	1.4800e-003	0.0560		225.0021	225.0021	0.0118		225.2498
Total	**0.0958**	**0.1130**	**1.2361**	**2.6000e-003**	**0.2054**	**1.6100e-003**	**0.2070**	**0.0545**	**1.4800e-003**	**0.0560**		**225.0021**	**225.0021**	**0.0118**		**225.2498**

3.6 Drill Piles - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5286	16.8941	13.0542	0.0200		0.4933	0.4933		0.5087	0.5087	0.0000	2,035.1806	2,035.1806	0.4852		2,045.3692
Total	**0.5286**	**16.8941**	**13.0542**	**0.0200**		**0.4933**	**0.4933**		**0.5087**	**0.5087**	**0.0000**	**2,035.1806**	**2,035.1806**	**0.4852**		**2,045.3692**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0958	0.1130	1.2361	2.6000e-003	0.2054	1.6100e-003	0.2070	0.0545	1.4800e-003	0.0560		225.0021	225.0021	0.0118		225.2498
Total	**0.0958**	**0.1130**	**1.2361**	**2.6000e-003**	**0.2054**	**1.6100e-003**	**0.2070**	**0.0545**	**1.4800e-003**	**0.0560**		**225.0021**	**225.0021**	**0.0118**		**225.2498**

3.7 Columns - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.7 Columns - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4231	22.4070	17.3737	0.0268		0.6800	0.6800		0.7016	0.7016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**0.4231**	**22.4070**	**17.3737**	**0.0268**		**0.6800**	**0.6800**		**0.7016**	**0.7016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.8 Falsework - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.8 Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4231	22.4070	17.3737	0.0268		0.6800	0.6800		0.7016	0.7016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**0.4231**	**22.4070**	**17.3737**	**0.0268**		**0.6800**	**0.6800**		**0.7016**	**0.7016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.9 Stem & Sofit - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.4178	27.9577	17.4689	0.0253		1.9427	1.9427		1.8302	1.8302		2,529.2104	2,529.2104	0.6269		2,542.3762
Total	**3.4178**	**27.9577**	**17.4689**	**0.0253**		**1.9427**	**1.9427**		**1.8302**	**1.8302**		**2,529.2104**	**2,529.2104**	**0.6269**		**2,542.3762**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1457	0.1718	1.8788	3.9600e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		342.0032	342.0032	0.0179		342.3796
Total	**0.1457**	**0.1718**	**1.8788**	**3.9600e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**342.0032**	**342.0032**	**0.0179**		**342.3796**

3.9 Stem & Sofit - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3847	21.0320	16.2349	0.0253		0.6425	0.6425		0.6613	0.6613	0.0000	2,529.2104	2,529.2104	0.6269		2,542.3762
Total	**0.3847**	**21.0320**	**16.2349**	**0.0253**		**0.6425**	**0.6425**		**0.6613**	**0.6613**	**0.0000**	**2,529.2104**	**2,529.2104**	**0.6269**		**2,542.3762**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1457	0.1718	1.8788	3.9600e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		342.0032	342.0032	0.0179		342.3796
Total	**0.1457**	**0.1718**	**1.8788**	**3.9600e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**342.0032**	**342.0032**	**0.0179**		**342.3796**

3.10 Deck - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1457	0.1718	1.8788	3.9600e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		342.0032	342.0032	0.0179		342.3796
Total	**0.1457**	**0.1718**	**1.8788**	**3.9600e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**342.0032**	**342.0032**	**0.0179**		**342.3796**

3.10 Deck - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4231	22.4070	17.3737	0.0268		0.6800	0.6800		0.7016	0.7016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**0.4231**	**22.4070**	**17.3737**	**0.0268**		**0.6800**	**0.6800**		**0.7016**	**0.7016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1457	0.1718	1.8788	3.9600e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		342.0032	342.0032	0.0179		342.3796
Total	**0.1457**	**0.1718**	**1.8788**	**3.9600e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**342.0032**	**342.0032**	**0.0179**		**342.3796**

3.11 Post-tension Bridge - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.11 Post-tension Bridge - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4231	22.4070	17.3737	0.0268		0.6800	0.6800		0.7016	0.7016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**0.4231**	**22.4070**	**17.3737**	**0.0268**		**0.6800**	**0.6800**		**0.7016**	**0.7016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.12 Remove Falsework - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7176	25.1601	14.5915	0.0215		1.7247	1.7247		1.6172	1.6172		2,195.5474	2,195.5474	0.5331		2,206.7413
Total	**2.7176**	**25.1601**	**14.5915**	**0.0215**		**1.7247**	**1.7247**		**1.6172**	**1.6172**		**2,195.5474**	**2,195.5474**	**0.5331**		**2,206.7413**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.12 Remove Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5670	18.2691	14.1930	0.0215		0.5308	0.5308		0.5490	0.5490	0.0000	2,195.5474	2,195.5474	0.5331		2,206.7413
Total	**0.5670**	**18.2691**	**14.1930**	**0.0215**		**0.5308**	**0.5308**		**0.5490**	**0.5490**	**0.0000**	**2,195.5474**	**2,195.5474**	**0.5331**		**2,206.7413**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.13 Remove Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7176	25.1601	14.5915	0.0215		1.7247	1.7247		1.6172	1.6172		2,195.5474	2,195.5474	0.5331		2,206.7413
Total	**2.7176**	**25.1601**	**14.5915**	**0.0215**		**1.7247**	**1.7247**		**1.6172**	**1.6172**		**2,195.5474**	**2,195.5474**	**0.5331**		**2,206.7413**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.13 Remove Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5670	18.2691	14.1930	0.0215		0.5308	0.5308		0.5490	0.5490	0.0000	2,195.5474	2,195.5474	0.5331		2,206.7413
Total	**0.5670**	**18.2691**	**14.1930**	**0.0215**		**0.5308**	**0.5308**		**0.5490**	**0.5490**	**0.0000**	**2,195.5474**	**2,195.5474**	**0.5331**		**2,206.7413**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.0575**	**0.0678**	**0.7416**	**1.5600e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**135.0013**	**135.0013**	**7.0800e-003**		**135.1499**

3.14 Paving - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3172	25.1758	14.9781	0.0223		1.4148	1.4148		1.3016	1.3016		2,339.8984	2,339.8984	0.6986		2,354.5681
Paving	0.6987					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.0159**	**25.1758**	**14.9781**	**0.0223**		**1.4148**	**1.4148**		**1.3016**	**1.3016**		**2,339.8984**	**2,339.8984**	**0.6986**		**2,354.5681**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1457	0.1718	1.8788	3.9600e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		342.0032	342.0032	0.0179		342.3796
Total	**0.1457**	**0.1718**	**1.8788**	**3.9600e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**342.0032**	**342.0032**	**0.0179**		**342.3796**

3.14 Paving - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9122	19.6998	16.9276	0.0223		0.6542	0.6542		0.6542	0.6542	0.0000	2,339.8984	2,339.8984	0.6986		2,354.5681
Paving	0.6987					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6108**	**19.6998**	**16.9276**	**0.0223**		**0.6542**	**0.6542**		**0.6542**	**0.6542**	**0.0000**	**2,339.8984**	**2,339.8984**	**0.6986**		**2,354.5681**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1457	0.1718	1.8788	3.9600e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		342.0032	342.0032	0.0179		342.3796
Total	**0.1457**	**0.1718**	**1.8788**	**3.9600e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**342.0032**	**342.0032**	**0.0179**		**342.3796**

3.15 Bridge and Roadway Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7794	0.0000	0.7794	0.1180	0.0000	0.1180			0.0000			0.0000
Off-Road	2.4020	24.2462	18.2190	0.0204		1.2993	1.2993		1.2264	1.2264		2,082.1520	2,082.1520	0.5083		2,092.8261
Total	**2.4020**	**24.2462**	**18.2190**	**0.0204**	**0.7794**	**1.2993**	**2.0787**	**0.1180**	**1.2264**	**1.3444**		**2,082.1520**	**2,082.1520**	**0.5083**		**2,092.8261**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0810	1.1758	0.7891	2.7000e-003	0.0627	0.0183	0.0810	0.0172	0.0168	0.0340		274.5864	274.5864	2.2200e-003		274.6331
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.1385**	**1.2436**	**1.5307**	**4.2600e-003**	**0.1860**	**0.0192**	**0.2052**	**0.0499**	**0.0177**	**0.0675**		**409.5877**	**409.5877**	**9.3000e-003**		**409.7830**

3.15 Bridge and Roadway Demolition - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3507	0.0000	0.3507	0.0531	0.0000	0.0531			0.0000			0.0000
Off-Road	0.0723	15.1648	12.7014	0.0204		0.2132	0.2132		0.2602	0.2602	0.0000	2,082.152 0	2,082.152 0	0.5083		2,092.826 1
Total	**0.0723**	**15.1648**	**12.7014**	**0.0204**	**0.3507**	**0.2132**	**0.5639**	**0.0531**	**0.2602**	**0.3133**	**0.0000**	**2,082.152 0**	**2,082.152 0**	**0.5083**		**2,092.826 1**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0810	1.1758	0.7891	2.7000e-003	0.0627	0.0183	0.0810	0.0172	0.0168	0.0340		274.5864	274.5864	2.2200e-003		274.6331
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0575	0.0678	0.7416	1.5600e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		135.0013	135.0013	7.0800e-003		135.1499
Total	**0.1385**	**1.2436**	**1.5307**	**4.2600e-003**	**0.1860**	**0.0192**	**0.2052**	**0.0499**	**0.0177**	**0.0675**		**409.5877**	**409.5877**	**9.3000e-003**		**409.7830**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509603	0.073619	0.192430	0.134105	0.036943	0.005309	0.012459	0.020989	0.001832	0.002087	0.006541	0.000614	0.003471

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Unmitigated	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**		**6.5000e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**		**6.5000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Winter

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4256-1 Eastern

San Diego County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	4.00	Acre	4.00	0.00	0
Other Non-Asphalt Surfaces	24.00	Acre	24.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2015
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Roadway only, no buildings

Construction Phase - per contractor

Off-road Equipment - per contractor

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Off-road Equipment -

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Off-road Equipment -

Off-road Equipment - Per Contractor

Off-road Equipment - per contractor

Off-road Equipment - Per Contractor

Off-road Equipment -

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Off-road Equipment - Per Contractor

Trips and VMT - Default indicated no worker trips on some phases, trips added

On-road Fugitive Dust -

Grading - Per Contractor

Vechicle Emission Factors -

Vechicle Emission Factors -

Vechicle Emission Factors -

Construction Off-road Equipment Mitigation - Regulatory Compliance

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	30.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	38.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	5.00

tblConstructionPhase	NumDays	440.00	15.00
tblConstructionPhase	NumDays	440.00	15.00
tblConstructionPhase	NumDays	440.00	5.00
tblConstructionPhase	NumDays	440.00	15.00
tblConstructionPhase	NumDays	440.00	15.00
tblConstructionPhase	NumDays	30.00	10.00
tblConstructionPhase	NumDays	45.00	10.00
tblConstructionPhase	NumDays	45.00	55.00
tblConstructionPhase	NumDays	35.00	15.00
tblConstructionPhase	NumDays	20.00	17.00
tblConstructionPhase	PhaseEndDate	2/6/2015	1/14/2015
tblConstructionPhase	PhaseEndDate	4/1/2015	4/10/2015
tblConstructionPhase	PhaseStartDate	7/18/2015	7/20/2015
tblConstructionPhase	PhaseStartDate	7/25/2015	7/27/2015
tblConstructionPhase	PhaseStartDate	8/1/2015	8/3/2015
tblConstructionPhase	PhaseStartDate	4/11/2015	4/13/2015
tblConstructionPhase	PhaseStartDate	4/18/2015	4/20/2015
tblConstructionPhase	PhaseStartDate	5/9/2015	5/11/2015
tblConstructionPhase	PhaseStartDate	5/30/2015	6/1/2015
tblConstructionPhase	PhaseStartDate	6/6/2015	6/8/2015
tblConstructionPhase	PhaseStartDate	6/27/2015	6/29/2015
tblConstructionPhase	PhaseStartDate	8/29/2015	8/31/2015
tblConstructionPhase	PhaseStartDate	1/24/2015	1/1/2015
tblConstructionPhase	PhaseStartDate	1/15/2015	1/26/2015
tblConstructionPhase	PhaseStartDate	8/8/2015	8/10/2015
tblGrading	AcresOfGrading	25.00	24.00
tblGrading	AcresOfGrading	137.50	4.00
tblGrading	MaterialImported	0.00	51,600.00

tblLandUse	LandUseSquareFeet	174,240.00	0.00
tblLandUse	LandUseSquareFeet	1,045,440.00	0.00
tblOffRoadEquipment	HorsePower	9.00	97.00
tblOffRoadEquipment	HorsePower	9.00	97.00
tblOffRoadEquipment	HorsePower	9.00	97.00
tblOffRoadEquipment	LoadFactor	0.56	0.37
tblOffRoadEquipment	LoadFactor	0.56	0.37
tblOffRoadEquipment	LoadFactor	0.56	0.37
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2015
tblTripsAndVMT	HaulingTripNumber	6,450.00	0.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	38.00
tblTripsAndVMT	WorkerTripNumber	8.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00

tblTripsAndVMT	WorkerTripNumber	0.00	25.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	11.3374	126.3741	88.1851	0.0935	26.9046	6.4123	33.3170	13.5876	5.8994	19.4870	0.0000	9,765.8167	9,765.8167	2.8478	0.0000	9,825.6205
Total	**11.3374**	**126.3741**	**88.1851**	**0.0935**	**26.9046**	**6.4123**	**33.3170**	**13.5876**	**5.8994**	**19.4870**	**0.0000**	**9,765.8167**	**9,765.8167**	**2.8478**	**0.0000**	**9,825.6205**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	1.9354	71.5938	50.7791	0.0935	12.2562	1.5764	13.8325	6.1540	1.6338	7.7877	0.0000	9,765.8167	9,765.8167	2.8478	0.0000	9,825.6205
Total	**1.9354**	**71.5938**	**50.7791**	**0.0935**	**12.2562**	**1.5764**	**13.8325**	**6.1540**	**1.6338**	**7.7877**	**0.0000**	**9,765.8167**	**9,765.8167**	**2.8478**	**0.0000**	**9,825.6205**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**82.93**	**43.35**	**42.42**	**0.00**	**54.45**	**75.42**	**58.48**	**54.71**	**72.31**	**60.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**	**0.0000**	**6.5000e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**	**0.0000**	**6.5000e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Clearing and Grubing	Site Preparation	1/1/2015	1/23/2015	5	17	
2	grading of mitigation site	Grading	1/1/2015	1/14/2015	5	10	
3	Grading N & S roadway	Grading	1/26/2015	4/10/2015	5	55	
4	Construct Trestle	Building Construction	4/13/2015	4/17/2015	5	5	
5	Drill Piles	Building Construction	4/20/2015	5/8/2015	5	15	
6	Columns	Building Construction	5/11/2015	5/29/2015	5	15	
7	Falsework	Building Construction	6/1/2015	6/5/2015	5	5	
8	Stem & Sofit	Building Construction	6/8/2015	6/26/2015	5	15	
9	Deck	Building Construction	6/29/2015	7/17/2015	5	15	
10	Post-tension Bridge	Building Construction	7/20/2015	7/24/2015	5	5	
11	Remove Falsework	Building Construction	7/27/2015	7/31/2015	5	5	
12	Remove Trestle	Building Construction	8/3/2015	8/7/2015	5	5	
13	Paving	Paving	8/10/2015	8/28/2015	5	15	
14	Bridge and Roadway Demolition	Demolition	8/31/2015	9/11/2015	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Clearing and Grubing	Rubber Tired Dozers	3	8.00	255	0.40
Clearing and Grubing	Tractors/Loaders/Backhoes	4	8.00	97	0.37
grading of mitigation site	Excavators	0	8.00	162	0.38
grading of mitigation site	Graders	1	8.00	174	0.41
grading of mitigation site	Rubber Tired Dozers	1	8.00	255	0.40
grading of mitigation site	Scrapers	2	8.00	361	0.48
grading of mitigation site	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading N & S roadway	Excavators	0	8.00	162	0.38
Grading N & S roadway	Graders	1	8.00	174	0.41
Grading N & S roadway	Rubber Tired Dozers	1	8.00	255	0.40
Grading N & S roadway	Scrapers	2	8.00	361	0.48
Grading N & S roadway	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Construct Trestle	Cranes	1	7.00	226	0.29
Construct Trestle	Forklifts	3	8.00	89	0.20
Construct Trestle	Generator Sets	1	8.00	84	0.74
Construct Trestle	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Construct Trestle	Welders	1	8.00	46	0.45
Drill Piles	Cranes	1	7.00	226	0.29
Drill Piles	Forklifts	2	8.00	89	0.20
Drill Piles	Generator Sets	1	8.00	84	0.74
Drill Piles	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Drill Piles	Welders	0	8.00	46	0.45
Columns	Cement and Mortar Mixers	2	7.00	97	0.37
Columns	Cranes	1	7.00	226	0.29
Columns	Forklifts	3	8.00	89	0.20

Columns	Generator Sets	1	8.00	84	0.74
Columns	Welders	1	8.00	46	0.45
Falsework	Cranes	1	7.00	226	0.29
Falsework	Forklifts	3	8.00	89	0.20
Falsework	Generator Sets	1	8.00	84	0.74
Falsework	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Falsework	Welders	1	8.00	46	0.45
Stem & Sofit	Cement and Mortar Mixers	2	7.00	97	0.37
Stem & Sofit	Cranes	1	7.00	226	0.29
Stem & Sofit	Forklifts	2	8.00	89	0.20
Stem & Sofit	Generator Sets	1	8.00	84	0.74
Stem & Sofit	Welders	1	8.00	46	0.45
Deck	Cement and Mortar Mixers	3	7.00	97	0.37
Deck	Cranes	1	7.00	226	0.29
Deck	Forklifts	3	8.00	89	0.20
Deck	Generator Sets	1	8.00	84	0.74
Deck	Welders	1	8.00	46	0.45
Post-tension Bridge	Cranes	1	7.00	226	0.29
Post-tension Bridge	Forklifts	3	8.00	89	0.20
Post-tension Bridge	Generator Sets	1	8.00	84	0.74
Post-tension Bridge	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Post-tension Bridge	Welders	1	8.00	46	0.45
Remove Falsework	Cranes	1	7.00	226	0.29
Remove Falsework	Forklifts	3	8.00	89	0.20
Remove Falsework	Generator Sets	1	8.00	84	0.74
Remove Falsework	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Remove Falsework	Welders	0	8.00	46	0.45
Remove Trestle	Cranes	1	7.00	226	0.29

Remove Trestle	Forklifts	3	8.00	89	0.20
Remove Trestle	Generator Sets	1	8.00	84	0.74
Remove Trestle	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Remove Trestle	Welders	0	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Bridge and Roadway Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Bridge and Roadway Demolition	Excavators	1	8.00	162	0.38
Bridge and Roadway Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Columns	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Stem & Sofit	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Deck	Tractors/Loaders/Backhoes	3	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Clearing and Grubing	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
grading of mitigation site	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading N & S roadway	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Construct Trestle	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Drill Piles	6	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Columns	11	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Falsework	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Stem & Sofit	10	38.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Deck	12	38.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Post-tension Bridge	9	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Falsework	7	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remove Trestle	7	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	38.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bridge and Roadway Demolition	3	15.00	0.00	36.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Clearing and Grubing - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412		4,111.7444	4,111.7444	1.2275		4,137.5225
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**		**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5225**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0734	0.0913	0.8682	1.7600e-003	0.1479	1.1600e-003	0.1490	0.0392	1.0600e-003	0.0403		152.1487	152.1487	8.4900e-003		152.3270
Total	**0.0734**	**0.0913**	**0.8682**	**1.7600e-003**	**0.1479**	**1.1600e-003**	**0.1490**	**0.0392**	**1.0600e-003**	**0.0403**		**152.1487**	**152.1487**	**8.4900e-003**		**152.3270**

3.2 Clearing and Grubing - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	0.5679	30.7955	20.3165	0.0391		0.6089	0.6089		0.6502	0.6502	0.0000	4,111.744 4	4,111.744 4	1.2275		4,137.522 4
Total	**0.5679**	**30.7955**	**20.3165**	**0.0391**	**8.1298**	**0.6089**	**8.7388**	**4.4688**	**0.6502**	**5.1190**	**0.0000**	**4,111.744 4**	**4,111.744 4**	**1.2275**		**4,137.522 4**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0734	0.0913	0.8682	1.7600e-003	0.1479	1.1600e-003	0.1490	0.0392	1.0600e-003	0.0403		152.1487	152.1487	8.4900e-003		152.3270
Total	**0.0734**	**0.0913**	**0.8682**	**1.7600e-003**	**0.1479**	**1.1600e-003**	**0.1490**	**0.0392**	**1.0600e-003**	**0.0403**		**152.1487**	**152.1487**	**8.4900e-003**		**152.3270**

3.3 grading of mitigation site - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.5673	0.0000	8.5673	3.5851	0.0000	3.5851			0.0000			0.0000
Off-Road	5.9420	69.3170	43.9616	0.0512		3.3219	3.3219		3.0562	3.0562		5,375.1332	5,375.1332	1.6047		5,408.8319
Total	**5.9420**	**69.3170**	**43.9616**	**0.0512**	**8.5673**	**3.3219**	**11.8892**	**3.5851**	**3.0562**	**6.6412**		**5,375.1332**	**5,375.1332**	**1.6047**		**5,408.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.3 grading of mitigation site - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.8553	0.0000	3.8553	1.6133	0.0000	1.6133			0.0000			0.0000
Off-Road	1.2331	40.6309	28.8709	0.0512		0.9653	0.9653		0.9816	0.9816	0.0000	5,375.133 2	5,375.133 2	1.6047		5,408.831 9
Total	**1.2331**	**40.6309**	**28.8709**	**0.0512**	**3.8553**	**0.9653**	**4.8206**	**1.6133**	**0.9816**	**2.5949**	**0.0000**	**5,375.133 2**	**5,375.133 2**	**1.6047**		**5,408.831 9**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.4 Grading N & S roadway - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2311	0.0000	6.2311	3.3385	0.0000	3.3385			0.0000			0.0000
Off-Road	5.9420	69.3170	43.9616	0.0512		3.3219	3.3219		3.0562	3.0562		5,375.1332	5,375.1332	1.6047		5,408.8319
Total	**5.9420**	**69.3170**	**43.9616**	**0.0512**	**6.2311**	**3.3219**	**9.5530**	**3.3385**	**3.0562**	**6.3947**		**5,375.1332**	**5,375.1332**	**1.6047**		**5,408.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.4 Grading N & S roadway - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8040	0.0000	2.8040	1.5023	0.0000	1.5023			0.0000			0.0000
Off-Road	1.2331	40.6309	28.8709	0.0512		0.9653	0.9653		0.9816	0.9816	0.0000	5,375.133 2	5,375.133 2	1.6047		5,408.831 9
Total	**1.2331**	**40.6309**	**28.8709**	**0.0512**	**2.8040**	**0.9653**	**3.7693**	**1.5023**	**0.9816**	**2.4839**	**0.0000**	**5,375.133 2**	**5,375.133 2**	**1.6047**		**5,408.831 9**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.5 Construct Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.5 Construct Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4231	22.4070	17.3737	0.0268		0.6800	0.6800		0.7016	0.7016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**0.4231**	**22.4070**	**17.3737**	**0.0268**		**0.6800**	**0.6800**		**0.7016**	**0.7016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.6 Drill Piles - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.4764	23.0879	13.3159	0.0200		1.5506	1.5506		1.4570	1.4570		2,035.1806	2,035.1806	0.4852		2,045.3692
Total	**2.4764**	**23.0879**	**13.3159**	**0.0200**		**1.5506**	**1.5506**		**1.4570**	**1.4570**		**2,035.1806**	**2,035.1806**	**0.4852**		**2,045.3692**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1019	0.1268	1.2059	2.4400e-003	0.2054	1.6100e-003	0.2070	0.0545	1.4800e-003	0.0560		211.3176	211.3176	0.0118		211.5652
Total	**0.1019**	**0.1268**	**1.2059**	**2.4400e-003**	**0.2054**	**1.6100e-003**	**0.2070**	**0.0545**	**1.4800e-003**	**0.0560**		**211.3176**	**211.3176**	**0.0118**		**211.5652**

3.6 Drill Piles - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5286	16.8941	13.0542	0.0200		0.4933	0.4933		0.5087	0.5087	0.0000	2,035.1806	2,035.1806	0.4852		2,045.3692
Total	**0.5286**	**16.8941**	**13.0542**	**0.0200**		**0.4933**	**0.4933**		**0.5087**	**0.5087**	**0.0000**	**2,035.1806**	**2,035.1806**	**0.4852**		**2,045.3692**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1019	0.1268	1.2059	2.4400e-003	0.2054	1.6100e-003	0.2070	0.0545	1.4800e-003	0.0560		211.3176	211.3176	0.0118		211.5652
Total	**0.1019**	**0.1268**	**1.2059**	**2.4400e-003**	**0.2054**	**1.6100e-003**	**0.2070**	**0.0545**	**1.4800e-003**	**0.0560**		**211.3176**	**211.3176**	**0.0118**		**211.5652**

3.7 Columns - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.7 Columns - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4231	22.4070	17.3737	0.0268		0.6800	0.6800		0.7016	0.7016	0.0000	2,689.577 1	2,689.577 1	0.6748		2,703.748 3
Total	**0.4231**	**22.4070**	**17.3737**	**0.0268**		**0.6800**	**0.6800**		**0.7016**	**0.7016**	**0.0000**	**2,689.577 1**	**2,689.577 1**	**0.6748**		**2,703.748 3**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.8 Falsework - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.8 Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4231	22.4070	17.3737	0.0268		0.6800	0.6800		0.7016	0.7016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**0.4231**	**22.4070**	**17.3737**	**0.0268**		**0.6800**	**0.6800**		**0.7016**	**0.7016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.9 Stem & Sofit - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.4178	27.9577	17.4689	0.0253		1.9427	1.9427		1.8302	1.8302		2,529.2104	2,529.2104	0.6269		2,542.3762
Total	**3.4178**	**27.9577**	**17.4689**	**0.0253**		**1.9427**	**1.9427**		**1.8302**	**1.8302**		**2,529.2104**	**2,529.2104**	**0.6269**		**2,542.3762**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1549	0.1928	1.8329	3.7100e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		321.2027	321.2027	0.0179		321.5792
Total	**0.1549**	**0.1928**	**1.8329**	**3.7100e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**321.2027**	**321.2027**	**0.0179**		**321.5792**

3.9 Stem & Sofit - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3847	21.0320	16.2349	0.0253		0.6425	0.6425		0.6613	0.6613	0.0000	2,529.2104	2,529.2104	0.6269		2,542.3762
Total	**0.3847**	**21.0320**	**16.2349**	**0.0253**		**0.6425**	**0.6425**		**0.6613**	**0.6613**	**0.0000**	**2,529.2104**	**2,529.2104**	**0.6269**		**2,542.3762**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1549	0.1928	1.8329	3.7100e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		321.2027	321.2027	0.0179		321.5792
Total	**0.1549**	**0.1928**	**1.8329**	**3.7100e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**321.2027**	**321.2027**	**0.0179**		**321.5792**

3.10 Deck - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.577 1	2,689.577 1	0.6748		2,703.748 3
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.577 1**	**2,689.577 1**	**0.6748**		**2,703.748 3**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1549	0.1928	1.8329	3.7100e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		321.2027	321.2027	0.0179		321.5792
Total	**0.1549**	**0.1928**	**1.8329**	**3.7100e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**321.2027**	**321.2027**	**0.0179**		**321.5792**

3.10 Deck - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4231	22.4070	17.3737	0.0268		0.6800	0.6800		0.7016	0.7016	0.0000	2,689.577 1	2,689.577 1	0.6748		2,703.748 3
Total	**0.4231**	**22.4070**	**17.3737**	**0.0268**		**0.6800**	**0.6800**		**0.7016**	**0.7016**	**0.0000**	**2,689.577 1**	**2,689.577 1**	**0.6748**		**2,703.748 3**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1549	0.1928	1.8329	3.7100e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		321.2027	321.2027	0.0179		321.5792
Total	**0.1549**	**0.1928**	**1.8329**	**3.7100e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**321.2027**	**321.2027**	**0.0179**		**321.5792**

3.11 Post-tension Bridge - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.11 Post-tension Bridge - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4231	22.4070	17.3737	0.0268		0.6800	0.6800		0.7016	0.7016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**0.4231**	**22.4070**	**17.3737**	**0.0268**		**0.6800**	**0.6800**		**0.7016**	**0.7016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.12 Remove Falsework - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7176	25.1601	14.5915	0.0215		1.7247	1.7247		1.6172	1.6172		2,195.5474	2,195.5474	0.5331		2,206.7413
Total	**2.7176**	**25.1601**	**14.5915**	**0.0215**		**1.7247**	**1.7247**		**1.6172**	**1.6172**		**2,195.5474**	**2,195.5474**	**0.5331**		**2,206.7413**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.12 Remove Falsework - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5670	18.2691	14.1930	0.0215		0.5308	0.5308		0.5490	0.5490	0.0000	2,195.5474	2,195.5474	0.5331		2,206.7413
Total	**0.5670**	**18.2691**	**14.1930**	**0.0215**		**0.5308**	**0.5308**		**0.5490**	**0.5490**	**0.0000**	**2,195.5474**	**2,195.5474**	**0.5331**		**2,206.7413**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.13 Remove Trestle - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7176	25.1601	14.5915	0.0215		1.7247	1.7247		1.6172	1.6172		2,195.5474	2,195.5474	0.5331		2,206.7413
Total	**2.7176**	**25.1601**	**14.5915**	**0.0215**		**1.7247**	**1.7247**		**1.6172**	**1.6172**		**2,195.5474**	**2,195.5474**	**0.5331**		**2,206.7413**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.13 Remove Trestle - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5670	18.2691	14.1930	0.0215		0.5308	0.5308		0.5490	0.5490	0.0000	2,195.5474	2,195.5474	0.5331		2,206.7413
Total	**0.5670**	**18.2691**	**14.1930**	**0.0215**		**0.5308**	**0.5308**		**0.5490**	**0.5490**	**0.0000**	**2,195.5474**	**2,195.5474**	**0.5331**		**2,206.7413**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.0611**	**0.0761**	**0.7235**	**1.4700e-003**	**0.1232**	**9.7000e-004**	**0.1242**	**0.0327**	**8.9000e-004**	**0.0336**		**126.7906**	**126.7906**	**7.0800e-003**		**126.9392**

3.14 Paving - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3172	25.1758	14.9781	0.0223		1.4148	1.4148		1.3016	1.3016		2,339.8984	2,339.8984	0.6986		2,354.5681
Paving	0.6987					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.0159**	**25.1758**	**14.9781**	**0.0223**		**1.4148**	**1.4148**		**1.3016**	**1.3016**		**2,339.8984**	**2,339.8984**	**0.6986**		**2,354.5681**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1549	0.1928	1.8329	3.7100e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		321.2027	321.2027	0.0179		321.5792
Total	**0.1549**	**0.1928**	**1.8329**	**3.7100e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**321.2027**	**321.2027**	**0.0179**		**321.5792**

3.14 Paving - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9122	19.6998	16.9276	0.0223		0.6542	0.6542		0.6542	0.6542	0.0000	2,339.898 4	2,339.898 4	0.6986		2,354.568 1
Paving	0.6987					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6108**	**19.6998**	**16.9276**	**0.0223**		**0.6542**	**0.6542**		**0.6542**	**0.6542**	**0.0000**	**2,339.898 4**	**2,339.898 4**	**0.6986**		**2,354.568 1**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1549	0.1928	1.8329	3.7100e-003	0.3122	2.4500e-003	0.3146	0.0828	2.2500e-003	0.0851		321.2027	321.2027	0.0179		321.5792
Total	**0.1549**	**0.1928**	**1.8329**	**3.7100e-003**	**0.3122**	**2.4500e-003**	**0.3146**	**0.0828**	**2.2500e-003**	**0.0851**		**321.2027**	**321.2027**	**0.0179**		**321.5792**

3.15 Bridge and Roadway Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7794	0.0000	0.7794	0.1180	0.0000	0.1180			0.0000			0.0000
Off-Road	2.4020	24.2462	18.2190	0.0204		1.2993	1.2993		1.2264	1.2264		2,082.1520	2,082.1520	0.5083		2,092.8261
Total	**2.4020**	**24.2462**	**18.2190**	**0.0204**	**0.7794**	**1.2993**	**2.0787**	**0.1180**	**1.2264**	**1.3444**		**2,082.1520**	**2,082.1520**	**0.5083**		**2,092.8261**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0902	1.2138	1.0044	2.6900e-003	0.0627	0.0183	0.0811	0.0172	0.0169	0.0340		273.9449	273.9449	2.2500e-003		273.9922
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.1513**	**1.2899**	**1.7279**	**4.1600e-003**	**0.1860**	**0.0193**	**0.2052**	**0.0499**	**0.0178**	**0.0676**		**400.7354**	**400.7354**	**9.3300e-003**		**400.9313**

3.15 Bridge and Roadway Demolition - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3507	0.0000	0.3507	0.0531	0.0000	0.0531			0.0000			0.0000
Off-Road	0.0723	15.1648	12.7014	0.0204		0.2132	0.2132		0.2602	0.2602	0.0000	2,082.1520	2,082.1520	0.5083		2,092.8261
Total	**0.0723**	**15.1648**	**12.7014**	**0.0204**	**0.3507**	**0.2132**	**0.5639**	**0.0531**	**0.2602**	**0.3133**	**0.0000**	**2,082.1520**	**2,082.1520**	**0.5083**		**2,092.8261**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0902	1.2138	1.0044	2.6900e-003	0.0627	0.0183	0.0811	0.0172	0.0169	0.0340		273.9449	273.9449	2.2500e-003		273.9922
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0761	0.7235	1.4700e-003	0.1232	9.7000e-004	0.1242	0.0327	8.9000e-004	0.0336		126.7906	126.7906	7.0800e-003		126.9392
Total	**0.1513**	**1.2899**	**1.7279**	**4.1600e-003**	**0.1860**	**0.0193**	**0.2052**	**0.0499**	**0.0178**	**0.0676**		**400.7354**	**400.7354**	**9.3300e-003**		**400.9313**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509603	0.073619	0.192430	0.134105	0.036943	0.005309	0.012459	0.020989	0.001832	0.002087	0.006541	0.000614	0.003471

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Unmitigated	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**		**6.5000e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	2.9600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.1300e-003	6.1300e-003	2.0000e-005		6.5000e-003
Total	**2.9000e-004**	**3.0000e-005**	**2.9600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.1300e-003**	**6.1300e-003**	**2.0000e-005**		**6.5000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Noise Technical Report for the El Camino Real Bridge/Road Widening Project

Prepared for
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March 2013

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FIGURES

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TABLES

APPENDICES

1.0 Summary

The project is located in the City of San Diego (City). The project includes the widening of the El Camino Real roadway between Via de la Valle and San Dieguito Road within the City. This existing segment of Via de la Valle is a 23-foot-wide two-lane collector roadway. This existing segment of El Camino Real is a 23-foot-wide, two-lane collector roadway. The road segment includes a bridge over the San Dieguito River, which crosses over the San Dieguito River approximately 0.3 mile south of the intersection of Via de la Valle and El Camino Real. The project proposes to modify this segment of El Camino Real and replace the bridge in order to improve the structural integrity of the bridge over the San Dieguito River, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, reduce traffic congestion, and improve consistency with the adopted land use plan in the project area. Via de la Valle from the existing intersection of El Camino Real eastward to El Camino Real North also would be widened to accommodate the proposed new configuration of El Camino Real.

1.1 Traffic Noise

Seven build alternatives are considered and analyzed at an equal level of detail: Central Alignment Alternative, the Road Capacity Alternative, the Bicycle Alignment Alternative, the Lower Alignment Alternative, the Western Alignment Alternative, the Eastern Alignment Alternative, and the Roundabout Alternative. Several of the alternatives are similar from a noise perspective. The Central Alignment Alternative, the Road Capacity Alternative, the Bicycle Alignment Alternative, and the Lower Alignment Alternative would result in the same potential impacts due to the similarity of the alignment and future traffic volumes. Thus, the alternatives analyzed in this analysis, based on roadway alignment changes are the Central Alignment Alternative, the Western Alignment Alternative, the Eastern Alignment Alternative, and the Roundabout Alternative.

1.1.1 Central Alignment Alternative

Under the Central Alignment Alternative near-term and horizon year traffic noise levels would range from 46 to 71 dBA CNEL at all receivers and noise level increases would range between 0 and 6 dBA at all land uses. However, all future noise levels for affected land uses would comply with the City and County of San Diego (County) noise standards thus identified noise levels and associated changes in noise levels are considered less than significant.

1.1.2 Western Alignment Alternative

Under the Western Alignment Alternative near-term and horizon year traffic noise levels would range from 45 to 71 dBA CNEL and noise level increases would range between -1 and 6 dBA at all land uses. However, all future noise levels for affected land uses would comply with the City and County noise standards thus identified noise levels and associated changes in noise levels are considered less than significant.

1.1.3 Eastern Alignment Alternative

Under the Eastern Alignment Alternative near-term and horizon year traffic noise levels would range from 46 to 71 dBA CNEL at all receivers and noise level increases would range between -4 and 9 dBA at affected land uses. However, all future noise levels for affected land uses would comply with the City and County noise standards thus identified noise levels and associated changes in noise levels are considered less than significant.

1.1.4 Roundabout Alternative

Under the Roundabout Alternative near-term and horizon year traffic noise levels would range from 48 to 70 dBA CNEL at all receivers and noise level increases would range between -5 and 6 dBA at all affected land uses. However, all future noise levels for affected land uses would comply with the City and County noise standards thus identified noise levels and associated changes in noise levels are considered less than significant.

1.2 Construction Noise

Construction noise levels would not exceed 75 A-weighted 1-hour average-equivalent noise level [dB (A) L_{eq}] at affected residences. Therefore, construction noise levels are projected to be within City and County standards. Additionally, as construction activities move away from the residential uses, noise levels would decrease. Construction activities would only be located immediately adjacent to residential properties for a short-term period.

Construction shall be limited to the hours of 7:00 A.M. to 7:00 P.M. Monday through Saturday, as stated in the City's Noise Abatement and Control Ordinance. In accordance with the City's noise ordinance, no construction shall take place on Sundays or on legal holidays specified in Section 21.04 of the San Diego Municipal Code with the exception of Columbus Day and George Washington's Birthday (President's Day).

2.0 Introduction

2.1 Project Location and Purpose

The El Camino Real Bridge/Road Widening Project (Project) is located in the City, in San Diego County, California. The site is located approximately 1.25 miles east of Interstate 5. It is accessible from the east and west by Via de la Valle and from the south by Del Mar Heights Road (See Figures 1 and 2). The road being modified is the segment of El Camino Real that runs from Via de la Valle on the north to San Dieguito Road on the south. The project site is located on the U.S. Geological Survey (USGS) Del Mar Quadrangle, Sections 6 & 7, Township 14 South, and Range 3 West.

The current 2,400 foot long and 23 feet wide segment of El Camino Real, classified as a 2-lane collector, has one travel lane in each direction and has no shoulders, bicycle lanes, or pedestrian walkways. The road segment includes a bridge over the San Dieguito River, which crosses over the San Dieguito River approximately 0.3 mile south of the intersection of Via de la Valle and El Camino Real. The bridge is not high enough to completely pass the 100-year flood. The City proposes to modify this segment of El Camino Real and replace the bridge in order to improve the structural integrity of the bridge over the San Dieguito River, alleviate problems associated with high flood events, improve pedestrian and vehicular access to nearby coastal and recreational resources, reduce traffic congestion, and improve consistency with the adopted land use plan in the project area. Via de la Valle from the intersection of existing El Camino Real eastward to El Camino Real North also would be widened to accommodate the proposed new configuration of El Camino Real.

The proposed project is being analyzed in an Environmental Impact Report (EIR) to satisfy the California Environmental Quality Act (CEQA) for the City and in a separate Environmental Assessment (EA) for the California Department of Transportation (Caltrans) District 11 and the Federal Highway Administration (FHWA) to satisfy the National Environmental Policy Act (NEPA). This noise report is being prepared in support of the CEQA documentation. A separate air quality report will be prepared for the NEPA document.

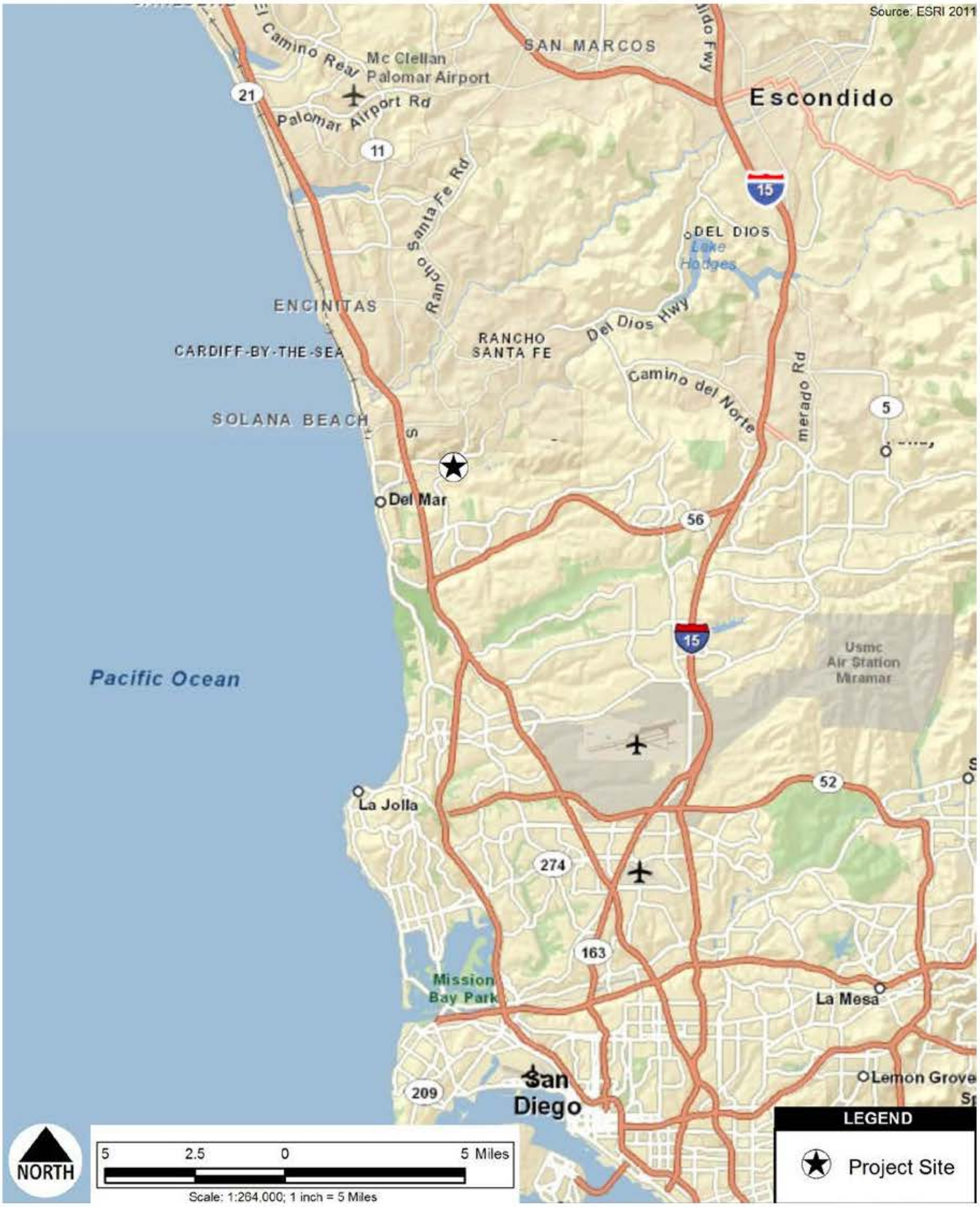

FIGURE 1
REGIONAL MAP

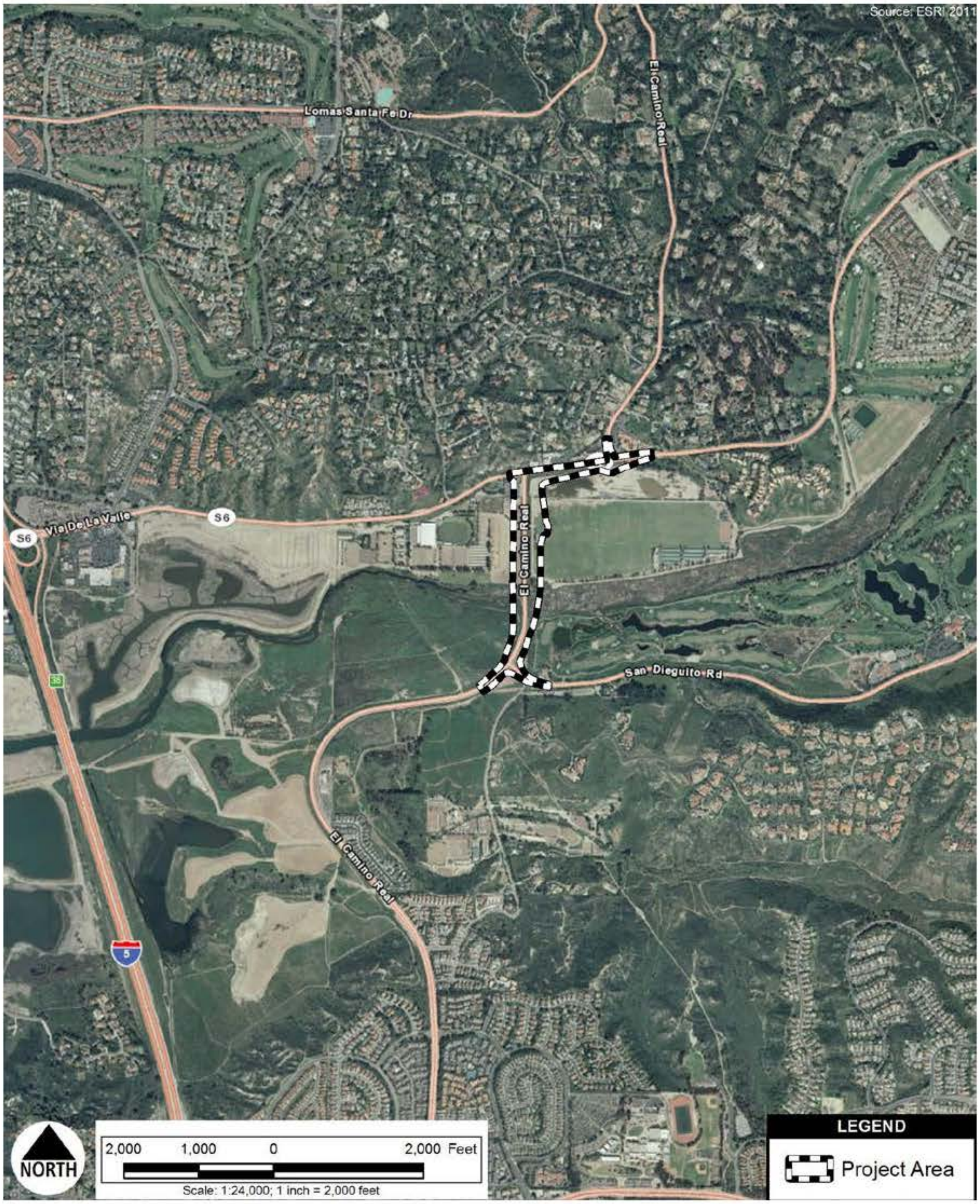

FIGURE 2
VICINITY MAP

2.2 General Setting

The affected portion of El Camino Real is situated within the northwestern part of the North City Future Urbanizing Area (NCFUA), a diverse planning area that extends from I-5 on the west to I-15 on the east, and from Los Penasquitos Canyon on the south to Santa Fe Valley on the north. The NCFUA Framework Plan (City of San Diego 1995) was initially adopted by the City Council in 1992 as an amendment to the General Plan in effect at that time. City zoning and the Framework Plan are the governing land use documents for the project area, although lands east of existing El Camino Real and north of Via de la Valle are outside of the NCFUA. El Camino Real is identified on the 2008 General Plan Land Use and Street System Map (Land Use Element, Figure LU-2).

Existing land uses along El Camino Real between Via de la Valle and San Dieguito Road include commercial, agricultural, recreational, and open space. Land uses along the west side of El Camino Real, from north to south, are Mary's Tack and Feed (a commercial establishment), Del Mar Horsepark (Horsepark; an equestrian facility owned by the State of California 22nd District Agricultural Association), and undeveloped parcels owned by the San Dieguito River Park Joint Powers Authority (JPA). Specific land uses along the east side of El Camino Real, from north to south, are undeveloped privately owned property, Polo Club fields owned by the City, and the expanded Fairbanks Ranch Country Club golf course, owned by the City. The commercial buildings along the north side of Via de la Valle are in the County of San Diego.

Most of El Camino Real within the study area is in the 100-year floodplain of the San Dieguito River, as are the lands east and west of the road in this location. The existing 100-year floodplain covers the majority of the valley floor including Polo Club fields and portions of Horsepark.

2.3 Alternatives

The build alternatives include the following:

- Central Alignment Alternative
- Road Capacity Alternative
- Bicycle Safety Alternative
- Western Alignment Alternative
- Eastern Alignment Alternative
- Roundabout Alternative
- Lower Elevation Alternative

It should be noted that for this project, two of these alternatives are not considered viable by Caltrans/FHWA because they do not provide all features needed to completely meet the purpose and need. These are the Road Capacity Alternative and the Bicycle Safety

Alternative. The City would not be able to receive federal funds if either of those alternatives were chosen.

The No Build (No Project) Alternative is evaluated in the EIR and the EA. This alternative represents the circumstance under which the El Camino Real Bridge/Road Widening Project does not proceed.

2.3.1 Common Design Features

All of the build alternatives would provide the following key components:

- The roadway of El Camino Real would be raised on fill above the 100-year flood level between San Dieguito Road and Via de la Valle and would meet existing grade at these locations.

- The bridge over the San Dieguito River would be demolished and replaced with a new structure raised above the 100-year flood level. The new bridge would be supported on cylindrical bridge piles and finished concrete columns. Abutments under the bridge would be protected from erosion by riprap, and the bank slope under the new bridge would be steepened to be approximately 1.5:1.

- All build alternatives except the Lower Elevation Alternative would provide an elevated multi-use trail undercrossing under the north bridge abutment. The trail undercrossing would be set at the 10-year flood level and would provide 12 feet of vertical clearance between the trail surface and the underside of the bridge. The new bridge height for alternatives with the trail undercrossing would be approximately 6 feet greater than the height of the existing bridge at the north abutment. The bridge height of the Lower Elevation Alternative would be only 3 feet higher because this alternative would not include the trail undercrossing.

- Via de la Valle would be widened to its ultimate width from the modified intersection with El Camino Real eastward to El Camino Real North. The existing dual 19-inch by 30-inch reinforced concrete pipe (RCP) storm drain culvert under Via de la Valle near El Camino Real North would be replaced with an underground triple reinforced concrete box (RCB) sized to pass the 100-year peak storm event from the upstream tributary north of Via de la Valle onto the property south of Via de la Valle. The 100-year peak storm event for that tributary is approximately 680 cubic feet per second (cfs).

- Project impacts to wetlands would be mitigated by enhancement and creation on a parcel owned by the JPA located west of the affected portion of El Camino Real.

2.3.2 Key Characteristics of Each Alternative

Key characteristics of the build alternatives are highlighted below.

- Central Alignment Alternative: This alternative would be roughly centered on the existing alignment of El Camino Real and would impact neighboring properties on the east and west sides of the road relatively equally, see Figure 3. El Camino Real would be widened to 104 feet to accommodate four travel lanes, a raised central median, bicycle lanes, and pedestrian walkways/parkways. The road would be elevated above the 100-year flood level on fill with 2:1 side slopes.

- Road Capacity Alternative: This alternative would have an alignment that is shifted west to avoid impacts to the wetlands in the drainage ditch parallel to the eastern edge of El Camino Real. El Camino Real would be widened to 60 feet to accommodate four travel lanes and a striped 2-foot wide median. This alternative would not provide left-turn pockets, raised central median, pedestrian walkways, or bicycle lanes. El Camino Real would be elevated above the 100-year flood level on fill with vertical retaining walls on both sides in order to keep the cross section as narrow as possible.

- Bicycle Safety Alternative: This alternative would have an alignment that is shifted west to avoid impacts to the wetlands in the drainage ditch parallel to the eastern edge of El Camino Real. El Camino Real would be widened to 60 feet to accommodate two travel lanes, bicycle lanes, and a raised central median. This alternative would not provide pedestrian walkways, parkways, or additional travel lanes. El Camino Real would be elevated above the 100-year flood level on fill with vertical retaining walls on both sides in order to keep the cross section as narrow as possible.

- Western Alignment Alternative: This alternative would have an alignment that is shifted west to avoid impacts to the wetlands in the drainage ditch parallel to the eastern edge of El Camino Real, see Figure 4. El Camino Real would be widened to 104 feet to accommodate four travel lanes, a raised central median, bicycle lanes, and pedestrian walkways/parkways. The road would be elevated above the 100-year flood level on fill with 2:1 side slopes.

- Eastern Alignment Alternative: This alternative would have an alignment that is shifted completely east of the drainage ditch to allow independent construction of the bridge, minimize impacts to developed properties along the western side of El Camino Real (Horsepark and Mary’s Tack and Feed), and reduce impacts to wetlands in the drainage ditch parallel to the eastern edge of El Camino Real, see Figure 5. El Camino Real would be widened to 104 feet to accommodate four travel lanes, a raised central median, bicycle lanes, and pedestrian walkways/parkways. The road would be elevated above the 100-year flood level on fill with 2:1 side slopes and would intersect with Via de la Valle at De la Valle Place, east of the existing intersection of El Camino Real with Via de la Valle.

- Roundabout Alternative (Figure 5): This alternative would be in the same alignment as the Eastern Alignment Alternative. For the Roundabout Alternative, however, roundabouts instead of signalized intersections would be located where El Camino Real meets San Dieguito Road, the Polo Field/Horsepark driveways, and De la Valle Place, and where Via de la Valle meets El Camino Real North. The footprint of the Roundabout Alternative would be larger than for the Eastern Alignment Alternative due to the need for transitions eastward and northward at the intersection of Via de la Valle and El Camino Real North, and the need for additional area to accommodate the roundabouts compared to typical intersections.

- Lower Elevation Alternative: This alternative would be roughly centered on the existing alignment of El Camino Real and would impact neighboring properties on the east and west sides of the road relatively equally. El Camino Real would be widened to 104 feet to accommodate four travel lanes, a raised central median, bicycle lanes, and pedestrian walkways/parkways. The road would be elevated just to the 100-year flood level on fill with 2:1 side slopes.

For all of the alternatives, the staging area has been proposed at the southern end of the project area, just northeast of the junction of El Camino Real and San Dieguito Road. The project would be constructed in stages, where the existing road and bridge would remain open during construction until one new side is constructed, then traffic would be diverted to the new side while the other side of the road and bridge are constructed. For the Eastern Alignment Alternative, the bridge and road north of the bridge would be constructed in one stage, independently of the existing bridge and road. Construction would last approximately 2.5 to 3.5 years, depending on the alternative.

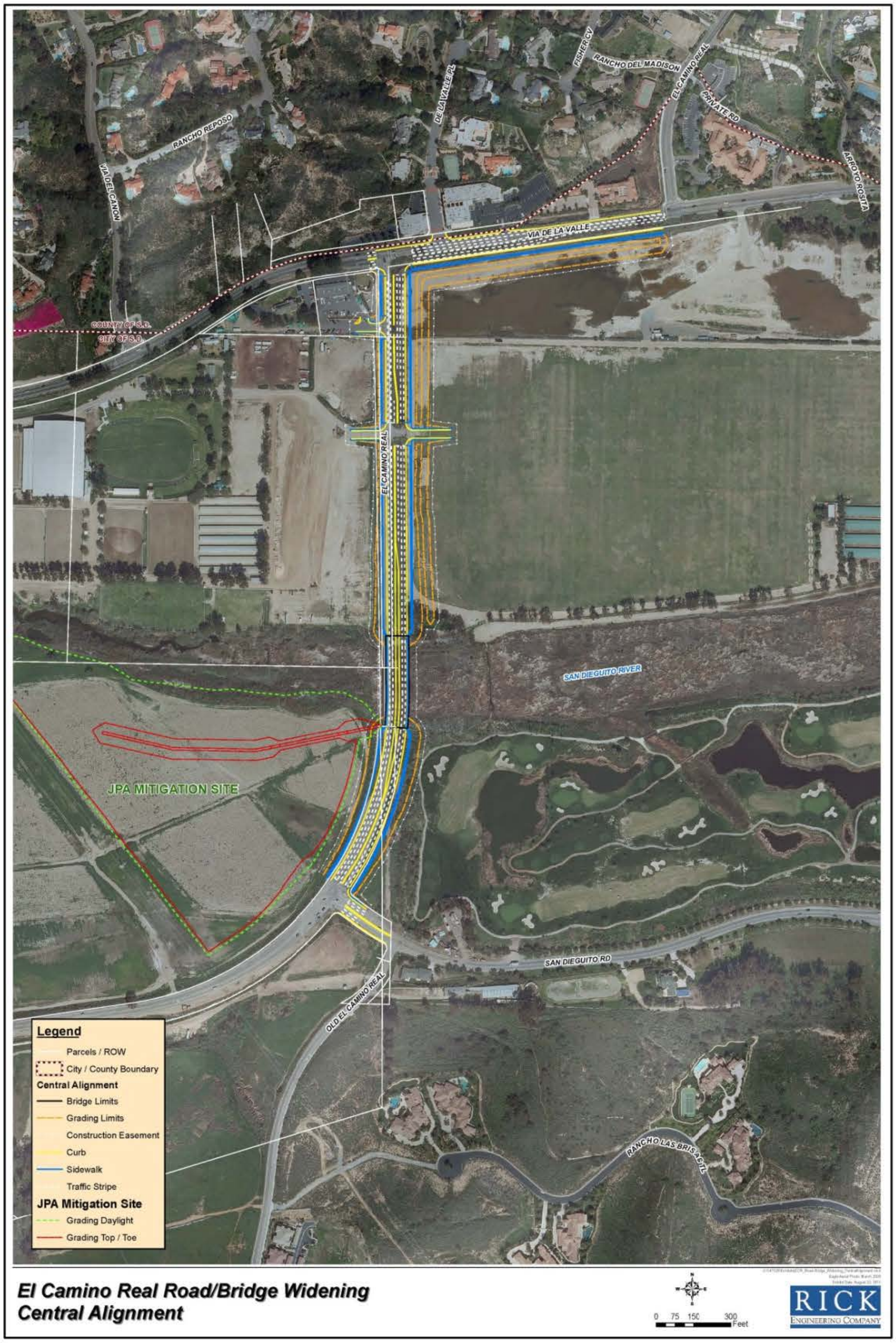

FIGURE 3
CENTRAL ALIGNMENT ALTERNATIVE

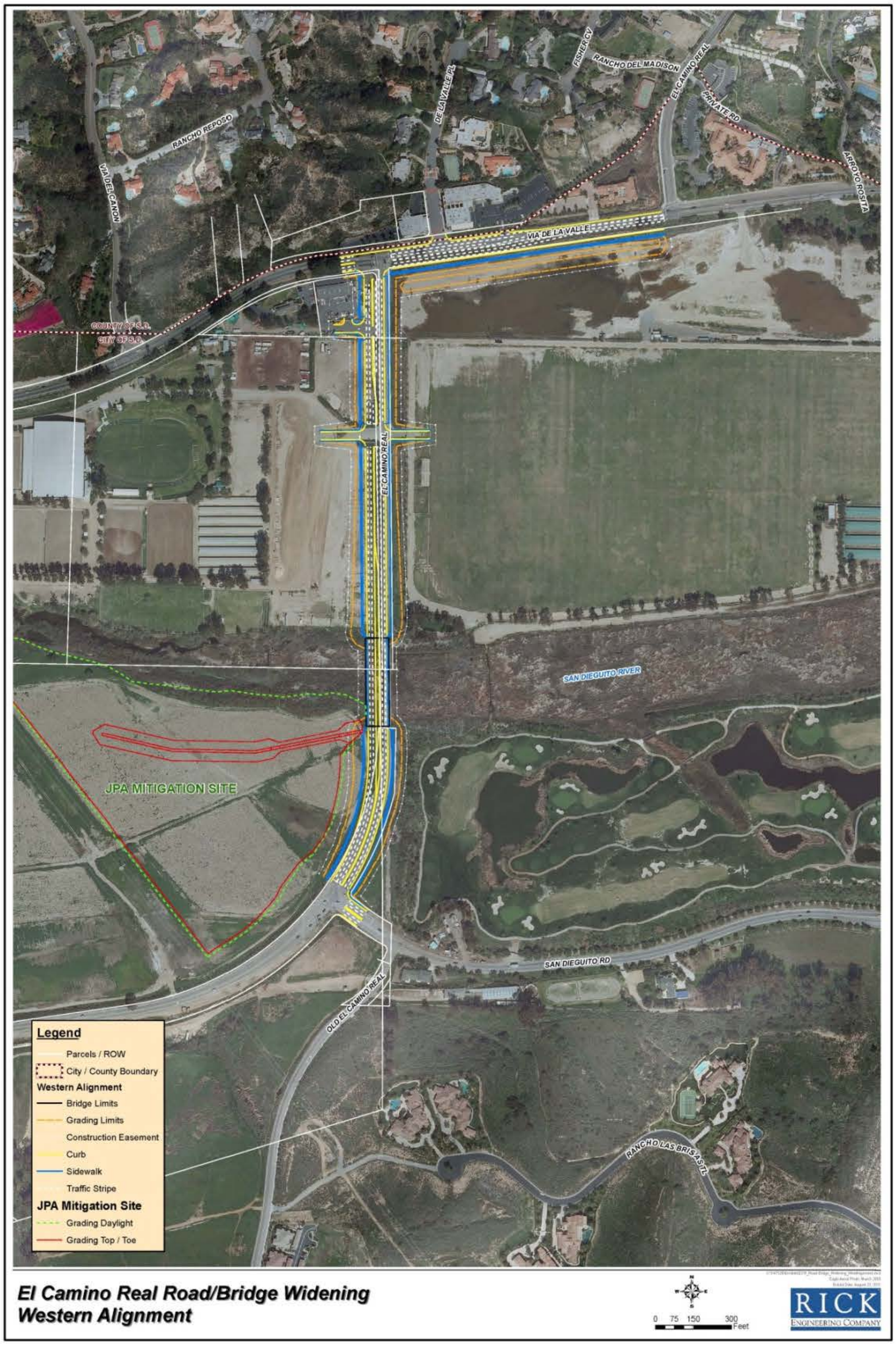

FIGURE 4
WESTERN ALIGNMENT ALTERNATIVE

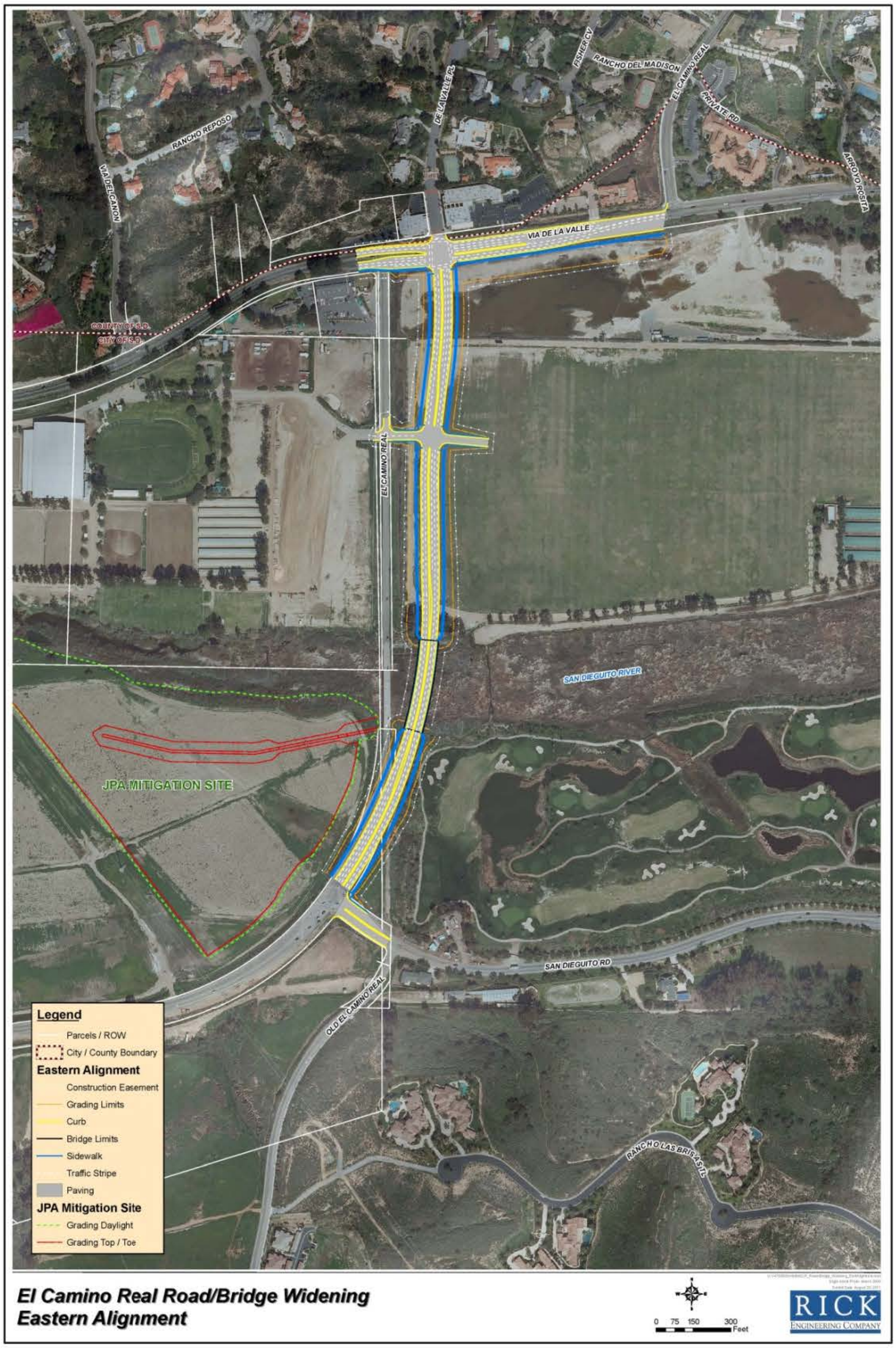

FIGURE 5
EASTERN ALIGNMENT ALTERNATIVE

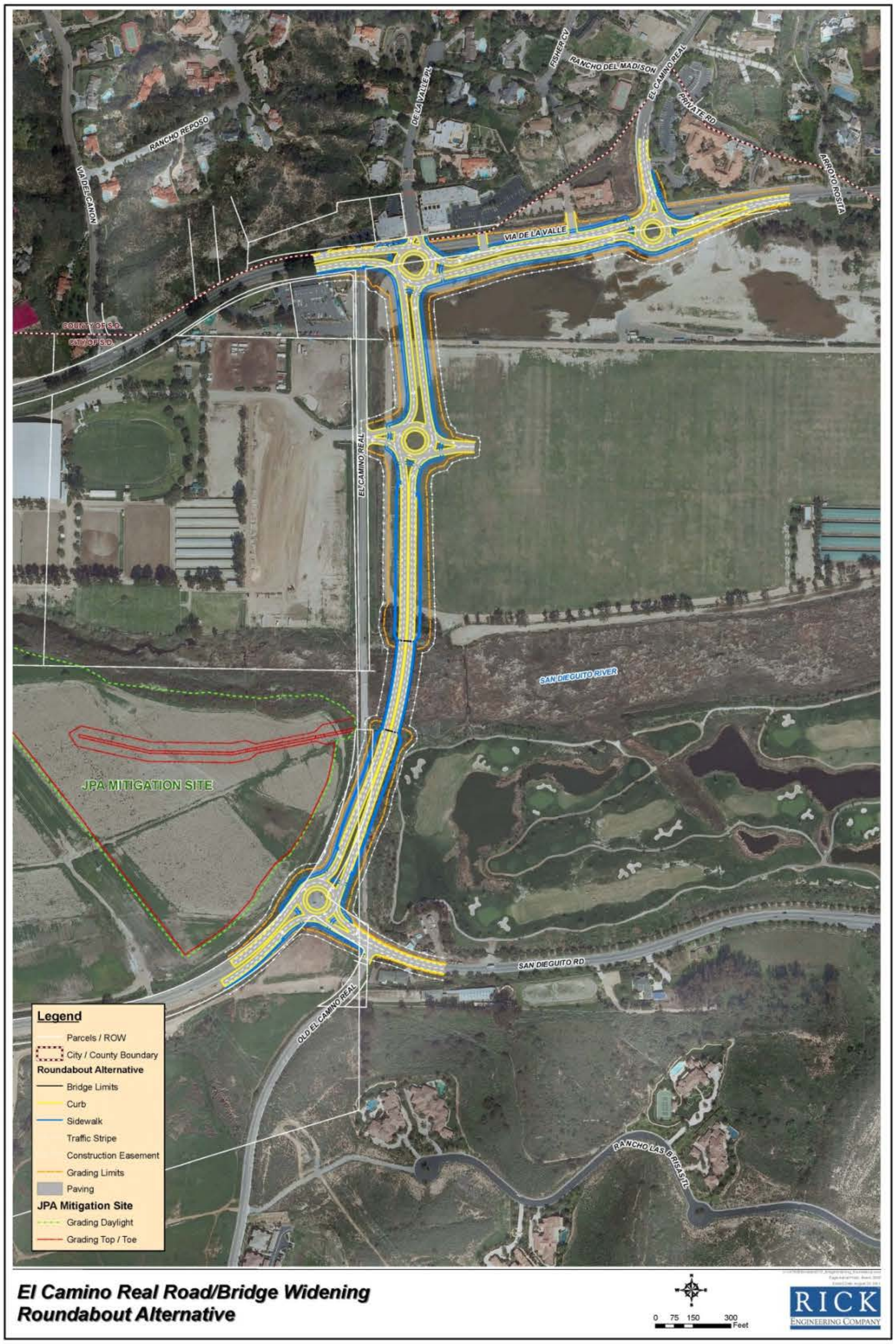

FIGURE 6
ROUNDABOUT ALTERNATIVE

3.0 Analysis Methodology

3.1 Applicable Standards and Definitions of Terms

3.1.1 Fundamentals of Traffic Noise and Noise Descriptors

The actual impact of noise is not a function of loudness alone. The time of day at which noise occurs and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors has been developed. The noise descriptors used for this study are the 1-hour average-equivalent noise level ($L_{eq[1]}$) and the Community Noise Equivalent Level (CNEL).

The CNEL is a 24-hour A-weighted average sound level [dB(A) L_{eq}] obtained after the addition of 5 decibels (dB) to sound levels occurring between 7:00 P.M. and 10:00 P.M., and 10 dB to sound levels occurring between 10:00 P.M. and 7:00 A.M. A-weighting is a frequency correction that often correlates well with the subjective response of humans to noise. Adding 5 dB and 10 dB to the evening and nighttime hours, respectively, accounts for the added sensitivity of humans to noise during these time periods.

Sound from a small, localized source (approximating a “point” source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level decreases or drops off at a rate of 6 dB for each doubling of the distance. However, roadway traffic noise is not a single, stationary point source of sound. The movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. The drop-off rate for a line source is 3 decibels for each doubling of distance.

Change in noise levels in the outdoor environment is perceived as follows: 3 dB(A) barely perceptible, 5 dB(A) readily perceptible, and 10 dB(A) perceived as a doubling or halving of noise.

3.1.2 Standards Applicable to Traffic Noise

3.1.2.1 City of San Diego

CEQA Significance Determination Thresholds

The City developed and published Significance Determination Thresholds for use in California Environmental Quality Act (CEQA) determinations. The CEQA significance standards are shown in Table 1. Based on the City’s 2011 Significance Determination

Thresholds, a significant noise impact would occur if implementation of the proposed project would:

1. Result in the exposure of noise-sensitive land uses to future noise levels which exceed those established in the adopted General Plan, noise ordinance, ALUCPs, or applicable standards of other agencies.
2. Result in a substantial increase in the existing ambient noise levels.
3. Result in increased land use incompatibilities associated with noise.
4. Result in construction or operation noise levels during the breeding season that would exceed 60dBA L_{eq} or existing ambient noise level, if above 60dBA L_{eq}.

TABLE 1
TRAFFIC NOISE SIGNIFICANCE THRESHOLDS (dBA CNEL)

Structure of Proposed Use that would be Impacted by Traffic Noise	Interior Space	Exterior Useable Space[1]	General Indication of Potential Significance
Single-family detached	45 dB	65 dB	Structure or outdoor useable area[2] is <50 feet from the center of the closest (outside) lane on a street with existing or future ADTs >7,500
Multi-family, school, library, hospital, day care center, hotel, motel, park, convalescent home	Development Services Department (DSD) ensures 45 dB pursuant to Title 24	65 dB	
Office, church, business, professional uses	n/a	70 dB	Structure or outdoor useable area is <50 feet from the center of the closest lane on a street with existing or future ADTs >20,000
Commercial, retail, industrial, outdoor spectator sports uses	n/a	75 dB	Structure or outdoor useable area is <50 feet from the center of the closest lane on a street with existing or future ADTs >40,000

[1] If a project is currently at or exceeds the significance thresholds for traffic noise described above and noise levels would result in less than a 3 dB increase, then the impact is not considered significant.
[2] Exterior useable areas do not include residential front yards or balconies unless the areas such as balconies are part of the required useable open space calculation for multi-family units.

Source: City of San Diego 2011

General Plan

The City's Noise Element of the General Plan specifies compatibility standards for different categories of land-use. The noise-land use compatibility guidelines are intended to be used for future development within San Diego to prevent future incompatibilities, which are provided in Table 2.

TABLE 2
CITY OF SAN DIEGO LAND USE COMPATIBILITY GUIDELINES
(DBA CNEL)

Land Use Category	Exterior Noise Exposure (dBA CNEL) 60 65 70 75				
Open Space and Parks and Recreational					
Community & Neighborhood Parks; Passive Recreation					
Regional Parks; Outdoor Spectator Sports, Golf Courses; Athletic Fields; Outdoor Spectator Sports, Water Recreational Facilities; Horse Stables; Park Maint. Facilities					
Agricultural					
Animal Raising, Maintain & Keeping; Commercial Stables					
Residential					
Single Units; Mobile Homes; Senior Housing		45			
Multiple Units; Mixed-Use Commercial/Residential; Live Work; Group Living Accommodations **For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3.*		45	45*		
Institutional					
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12 Educational Facilities; Libraries; Museums; Places of Worship; Child Care Facilities		45			
Vocational or Professional Educational Facilities; Higher Education Institution Facilities (Community or Junior Colleges, Colleges, or Universities)		45	45		
Cemeteries					
Sales					
Building Supplies/Equipment; Food, Beverages & Groceries; Pets & Pet Supplies; Sundries, Pharmaceutical, & Convenience Sales; Wearing Apparel & Accessories			50	50	
Commercial Services					
Building Services; Business Support; Eating & Drinking; Financial Institutions; Assembly & Entertainment; Radio & Television Studios; Golf Course Support			50	50	
Visitor Accommodations		45	45	45	
Offices					
Business & Professional; Government; Medical, Dental & Health Practitioner; Regional & Corporate Headquarters			50	50	
Vehicle and Vehicular Equipment Sales and Services Use					
Commercial or Personal Vehicle Repair & Maintenance; Commercial or Personal Vehicle Sales & Rentals; Vehicle Equipment & Supplies Sales & Rentals; Vehicle Parking					
Wholesale, Distribution, Storage Use Category					
Equipment & Materials Storage Yards; Moving & Storage Facilities; Warehouse; Wholesale Distribution					
Industrial					
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking & Transportation Terminals; Mining & Extractive Industries					
Research & Development				50	

	Compatible	Indoor Uses	Standard construction methods should attenuate exterior noise to an acceptable indoor noise level. Refer to Section I.
		Outdoor Uses	Activities associated with the land use may be carried out.
	Conditionally Compatible	Indoor Uses	Building structure must attenuate exterior noise to the indoor noise level indicated by the number for occupied areas. Refer to Section I.
		Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable. Refer to Section I.
	Incompatible	Indoor Uses	New construction should not be undertaken.
		Outdoor Uses	Severe noise interference makes outdoor activities unacceptable.

Source: City of San Diego Noise Element 2008

The community land uses surrounding Via de la Valle are urbanized residential, commercial, rural equestrian and recreational uses. As shown in Table 2, residential, commercial, and equestrian (assumed similar to commercial stables) uses are “compatible” with noise levels up to 60, 65, and 70 CNEL, respectively. These land uses are “conditionally compatible” with noise levels up to 65, 75, and 75 CNEL, respectively. “Compatible” means that activities associated with the land use may be carried out and “conditionally compatible” means that feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable.

3.1.2.2 County of San Diego

Guidelines for Determining Significance

There are residences in the project vicinity that are located on unincorporated County land. The County Guidelines for Determining Significance (2009) state that significant impacts would occur, if project implementation resulted in the exposure of any on- or off-site, existing, or reasonably foreseeable future noise-sensitive land use (NSLU) to exterior or interior noise in excess of any of the following:

A. Exterior Locations:

   i. 60 decibels (dB) (Community Noise Equivalent Level [CNEL]); or

   ii. An increase of 10 dB (CNEL) over pre-existing noise.

   In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

   (1) Net lot area up to 4,000 square feet: 400 square feet

   (2) Net lot area 4,000 square feet to 10 acres: 10 percent of net lot area

   (3) Net lot area over 10 acres: 1 acre

   For all other projects, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

B. Interior Locations: 45 dB (CNEL) except for the following cases:

   i. Rooms which are usually occupied only a part of the day (schools, libraries, or similar facilities), the interior 1-hour average sound level due to noise outside should not exceed 50 decibels (A).

   ii. Corridors, hallways, stairwells, closets, bathrooms, or any room with a volume less than 490 cubic feet.

When existing noise levels already exceed the noise guidelines, a different standard is applied. When an increase of 3 dB to 5 dB occurs, the result is a perceptible increase in noise, and in cases where existing noise levels already exceed applicable noise guidelines, an increase of 3 dB may be considered significant. An increase in 3 dB would result from a doubling of the traffic volume on a roadway.

General Plan

Revisions to the General Plan Noise Element have not been updated in the Guidelines at this time, however, the new General Plan noise compatibility guidelines and standards as contained in the General Plan are applicable to the proposed project. Table 3 provides County's current noise compatibility guidelines and Table 4 provides the County's noise standards.

3.1.3 Standards Applicable to Construction Noise

3.1.3.1 City of San Diego

Section 59.5.0404 of the City's Noise Abatement and Control Ordinance states that:

> A. It shall be unlawful for any person, between the hours of 7:00 P.M. of any day and 7:00 A.M. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise. . . .
>
> B. It shall be unlawful for any person, including the City of San Diego, to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 A.M. to 7:00 P.M.

TABLE 3
NOISE COMPATIBILITY GUIDELINES

	Land Use Category	Exterior Noise Levels					
		55	60	65	70	75	80
A	Residential—single family residences, mobile homes, senior housing, convalescent homes						
B	Residential—multi-family residences, mixed-use (commercial/residential)						
C	Transient lodging—motels, hotels, resorts						
D	Schools, churches, hospitals, nursing homes, child care facilities						
E	Passive recreational parks, nature preserves, contemplative spaces, cemeteries						
F	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation						
G	Office\professional, government, medical\dental, commercial, retail, laboratories						
H	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair						

	ACCEPTABLE—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.
	CONDITIONALLY ACCEPTABLE—New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. Criteria for determining exterior and interior noise levels are listed in Table 8, Noise Standards. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate county decision-maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.
	UNACCEPTABLE—New construction or development shall not be undertaken.

* Denotes facilities used for part of the day; therefore, an hourly standard would be used rather than CNEL, refer to Table 4.

SOURCE: County of San Diego Noise Element 2010

TABLE 4
NOISE STANDARDS*

1. The exterior noise level (as defined in Item 3) standard for Category A shall be 60 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
2. The exterior noise level standard for Categories B and C shall be 65 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
3. The exterior noise level standard for Categories D and G shall be 65 CNEL and the interior noise level standard shall be 50 dBA Leq (one hour average).
4. For single-family detached dwelling units, “exterior noise level” is defined as the noise level measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum net lot area:
   (i) for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet,
   (ii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area;
   (iii) for lots over 10 acres in area, the exterior area shall include 1 acre.
5. For all other residential land uses, "exterior noise level" is defined as noise measured at exterior areas which are provided for private or group usable open space purposes. “Private Usable Open Space” is defined as usable open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. “Group Usable Open Space” is defined as usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.
6. For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.
7. For noise sensitive land uses where people normally do not sleep at night, the exterior and interior noise standard may be measured using either CNEL or the one-hour average noise level determined at the loudest hour during the period when the facility is normally occupied.
8. The exterior noise standard does not apply for land uses where no exterior use area is proposed or necessary, such as a library.
9. For Categories E and F the exterior noise level standard shall not exceed the limit defined as “Acceptable” in Table N-1 or an equivalent one-hour noise standard.

*Exterior Noise Level compatibility guidelines for Land Use Categories A-H are identified in Table 3, Noise Compatibility Guidelines.

SOURCE: County of San Diego Noise Element 2010

3.1.3.2 County of San Diego

Section 36.409 of the County's Code of Regulatory Ordinances states that:

> Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7:00 A.M. and 7:00 P.M., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

3.1.3.3 Wildlife Habitat

In 1991, the U.S. Fish and Wildlife Service (USFWS) recommended that hourly noise levels not exceed 60 dBA L_{eq} or ambient conditions, whichever is greater; to protect the Gnatcatcher and other endangered bird species. The City of San Diego has adopted this standard for all sensitive species (City of San Diego 2011). Therefore, the 60 dBA Leq or ambient would be used as the noise criteria to assess noise impacts on sensitive wildlife both on and off site.

3.2 Existing Noise Level Measurements

To determine the existing noise environment and assess the potential impacts of noise resulting from the widening of El Camino Real, noise measurements were taken by RECON Environmental in the project vicinity on March 2, 2012. Noise measurements were taken with one Larson-Davis Model 820 Type 2 Integrating Sound Level Meter, serial number 1824. The following parameters were used:

Filter:	A-weighted
Response:	Fast
Time History Period:	5 seconds

The meter was calibrated prior to the day's measurements. Seven ground-floor measurements (5 feet above the ground) were taken adjacent to Via de la Valle, El Camino Real, and San Dieguito Road. Additionally, while the ground-floor measurements were being made, traffic counts were taken for 15 minutes each. The measurements are discussed in Section 4.0.

3.3 Traffic Noise Analysis

3.3.1 Traffic Parameters

Traffic volumes on all study area roadways were taken from the project traffic report, *Draft Transportation Analysis for El Camino Real Road and Bridge Widening Project* (Urban Systems Associates, Inc. 2012). Existing speeds were developed from site visits and driving the alignment. Vehicle mixes for area roadways were taken from field counts conducted in conjunction with noise measurements.

Future traffic vehicle mixes on all area roadways were assumed to be the same as those used in the existing conditions. Future speeds on all but the Roundabout Alternative were also assumed to be the same as the existing conditions. Under the Roundabout Alternative average traffic speeds are assumed to be 30 mph. Future (2035) traffic volumes were obtained from the project traffic report (Urban Systems Associates, Inc. 2012). Table 5 provides the traffic volume mix used in TNM. All traffic volumes used in TNM for each scenario are included in Appendix B.

TABLE 5
TRAFFIC VOLUME MIX USED IN TNMNM

	Volume by Direction		
Roadway Segment	Automobiles	Medium Trucks	Heavy Trucks*
Via de la Valle	95.4%	2.6%	1%
Camino Del Real	98%	1%	1%
San Dieguito Road	98%	1%	1%
El Camino Real North	98%	1%	1%

*Where no heavy or medium trucks were observed, or the value was less than 1%, 1% was used.

3.3.2 Analysis of Traffic Noise

FHWA Traffic Noise Model, version 2.5 (TNM) was used to predict existing and future traffic noise levels at specific receiver locations (FHWA 2004). Inputs to TNM include the three-dimensional coordinates of roadways, noise receivers, and topographic or planned barriers that would affect noise propagation; vehicle volumes and speeds, by type of vehicle; and absorption factors based on modeled ground type. Existing and future roadway geometries and elevation data were taken from design drawing prepared by the project engineer (Rick Engineering 2012). Receiver locations were chosen from design drawings, aerial photographs, and site observations. Adjustment (K-factors) factors may also be applied to calibrate the TNM to actual site conditions.

TNM outputs are predicted loudest hour noise levels at the selected receivers, thus to relate the modeled noise levels to the City and County noise standards 1 dBA was added to modeled level to represent the CNEL. Receptors were modeled at exterior locations 5 feet above the existing grade.

4.0 Existing Conditions

Noise measurements were taken near the project site on Friday, March 2, 2012, between the hours of 11:30 A.M. and 3:00 P.M. to obtain existing ambient noise levels. The weather was warm and sunny with a slight breeze. A total of seven measurements were made on the project site as described below.

The primary source of on-site noise was due to traffic on Via De La Valle and El Camino Real. The locations of the measurements are shown on Figure 7, and the noise measurement data are contained in Appendix A.

Measurement 1 was taken on Via De La Valle east of the intersection of Via De La Valle and El Camino Real, near Casa Palmera. The dominant noise source was traffic on Via De La Valle. During the 15-minute measurement period, traffic on Via De La Valle was counted.

Measurement 2 was taken on Via De La Valle west of the intersection of Via De La Valle and El Camino Real. The dominant noise source was traffic on Via De La Valle. During the 15-minute measurement period, traffic on Via De La Valle was counted.

Measurement 3 was taken on Via De La Valle east of the intersection of Via De La Valle and El Camino Real, near Market Restaurant + Bar. The dominant noise source was traffic on Via De La Valle and El Camino Real. During the 15-minute measurement period, traffic on Via De La Valle was counted.

Measurement 4 was taken on El Camino Real south of the intersection of El Camino Real and Via De La Valle, near Mary’s Tack and Feed. The dominant noise source was traffic on Via De La Valle and El Camino Real. During the 15-minute measurement period, traffic on El Camino Real was counted.

Measurement 5 was taken on El Camino Real between Via De La Valle and San Dieguito Road, near the San Diego Polo Club. The dominant noise source was traffic on El Camino Real. During the 15-minute measurement period, traffic on El Camino Real was counted.

Measurement 6 was taken on El Camino Real north of the intersection of El Camino Real and San Dieguito Road, near the Fairbanks Ranch Country Club Golf Course. The dominant noise source was traffic on El Camino Real. During the 15-minute measurement period, traffic on El Camino Real was counted.

Measurement 7 was taken on San Dieguito Road east of the intersection of San Dieguito Road and Old El Camino Real. The dominant noise source was traffic San Dieguito Road. During the 15-minute measurement period, traffic on San Dieguito Road was counted.

During the measurement periods, the average noise levels at each measurement location are outlined in Table 6 below. The existing noise levels varied between 70 and 75 dBA adjacent to the roadways.

TABLE 6
AVERAGE NOISE LEVEL

Measurement	Roadway	Noise Level dB(A)	Distance from Centerline (feet)
1	Via de La Valle	70.3	43.8
2	Via de La Valle	73.9	17.3
3	Via de La Valle	70.5	25.8
4	El Camino Real	70.6	19.4
5	El Camino Real	74.8	15.7
6	El Camino Real	73.0	30.5
7	San Dieguito Road	72.6	22.8

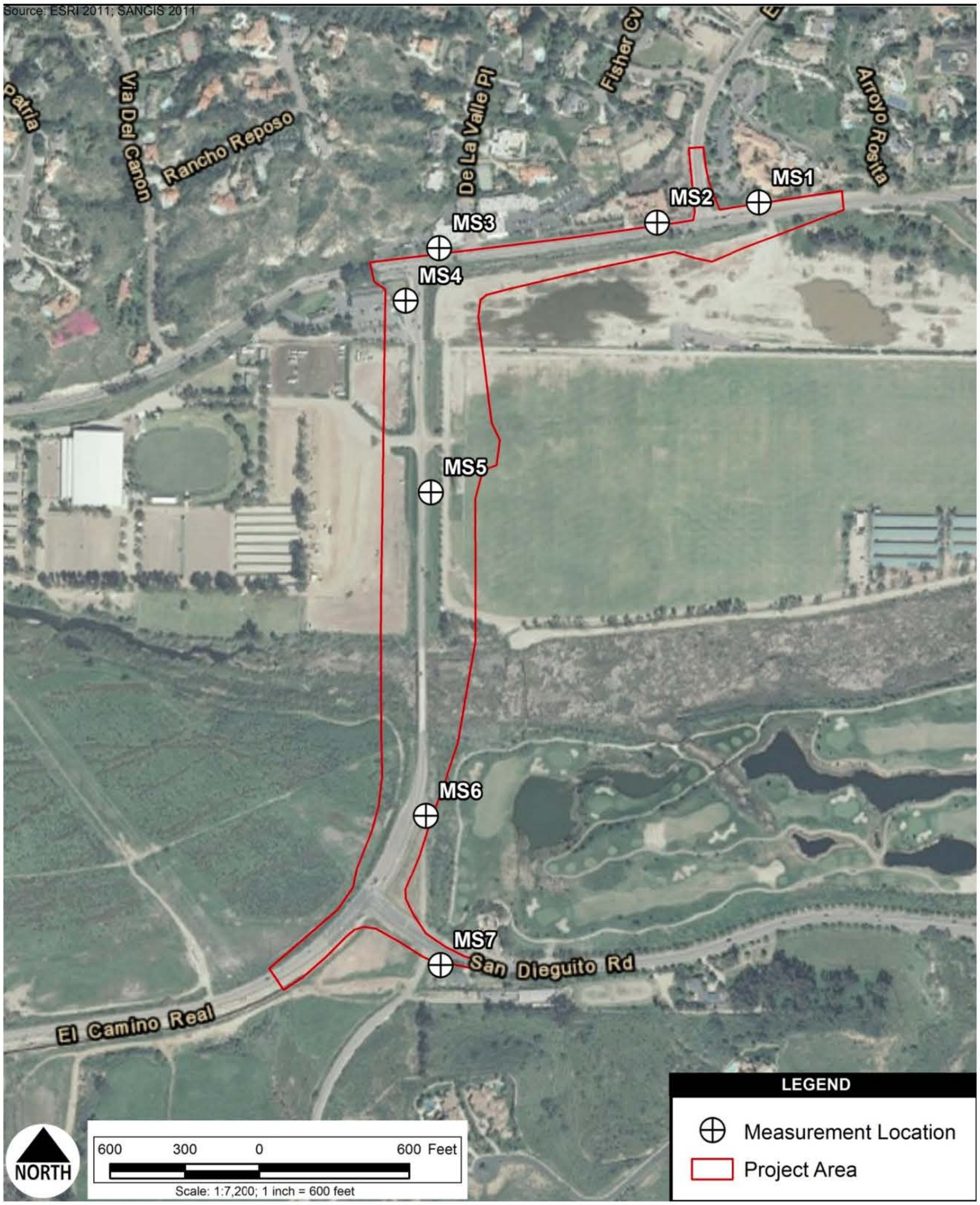

FIGURE 7
NOISE MEASUREMENT LOCATIONS

5.0 Future Environmental Noise Impacts

5.1 Traffic Noise Impacts

Several of the alternatives are similar from a noise perspective. The Central Alignment Alternative, the Road Capacity Alternative, the Bicycle Alignment Alternative, and the Lower Alignment Alternative would result in the same potential impacts due to the similarity of the alignment and future traffic volumes. Thus, the alternatives analyzed in this analysis, based on roadway alignment changes are the Central Alignment Alternative, the Western Alignment Alternative, the Eastern Alignment Alternative, and the Roundabout Alternative. The modeled receptor locations for all alignment alternatives are provided in Figure 8 below.

The analysis of the Existing and Existing Plus Project for each alternative is provided to assess the direct traffic impact of the proposed project. The 2035 analysis is provided for determining future cumulative traffic impacts of the proposed roadway improvements. A detailed discussion of impacted receptors under each alternative is provided under separate headings. Predicted noise levels for the Central Alignment are shown in Table 7, the noise levels and changes in noise levels for Western alignment are shown in Table 8, the Eastern Alignment is shown in Table 9, and the Roundabouts Alternative is shown in Table 10.

Increases in noise levels under any of the Build Alternatives would be caused primarily by the change in height from raising El Camino Real and the intersection at Via de la Valle above the flood plain or a movement of the roadway closer to local receivers. Traffic noise-level increases under the No Project Alternative are due only to projected increases in traffic volumes on the existing local roadways. The noise level decreases shown in the modeling would be the result of a receptor location receiving additional shielding from topography or increased distances between the roadway and receivers.

Additionally, under the Roundabout Alternative there are other noise level reductions due to less braking and accelerating as traditional intersection movements as well as an average decrease in speed associated with safe approach and departure speeds considered during the design stage of roundabouts.

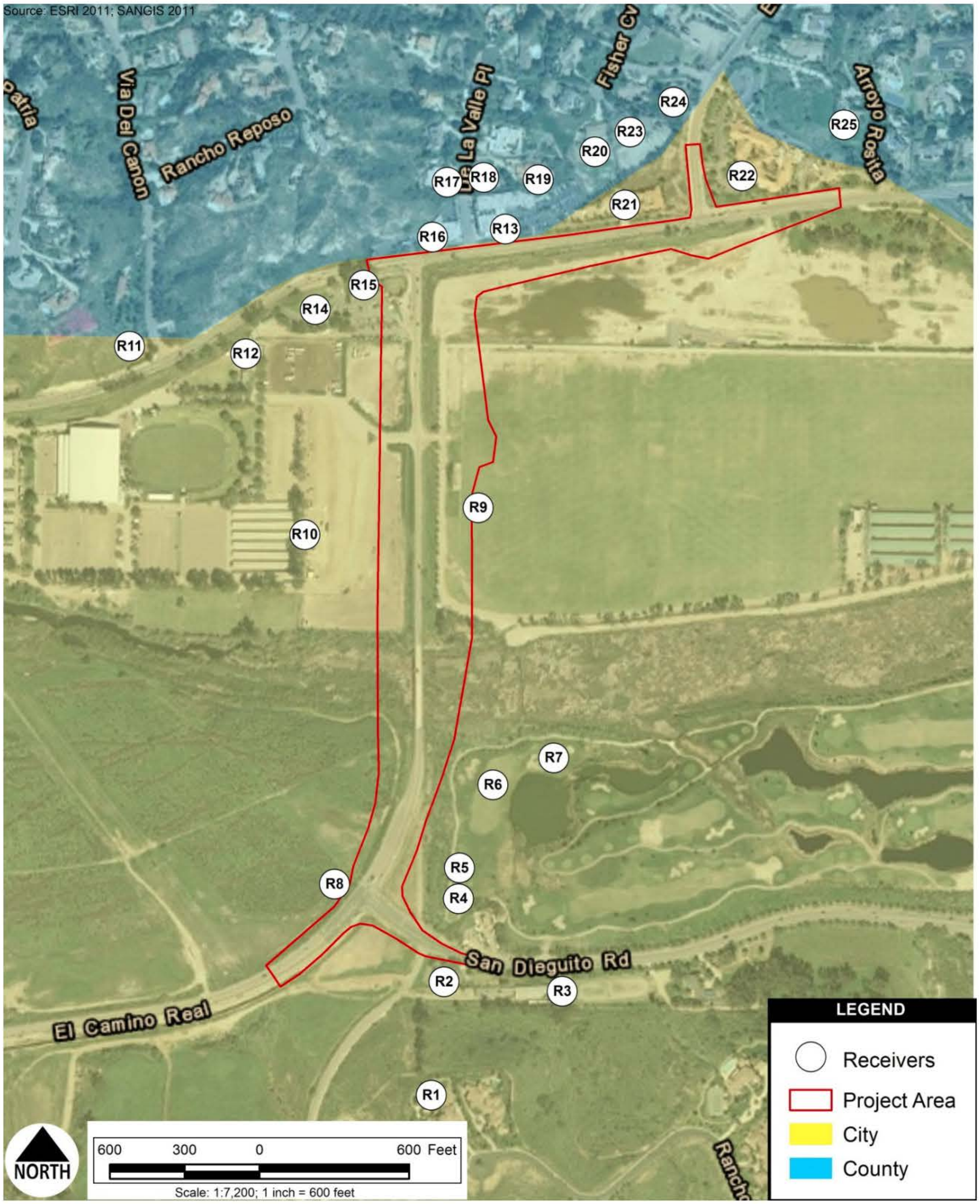

FIGURE 8
MODELED NOISE RECEPTOR LOCATIONS

TABLE 7
CENTRAL ALIGNMENT TRAFFIC NOISE LEVELS

			Existing Conditions	Existing + Project		No Project Future		Cumulative + Project		
Receiver ID	Description	Use	CNEL	CNEL	Increase	CNEL	Increase	CNEL	Total Increase	Project Contribution
R1	4110 Rancho Las Brisas Trail	Residential	52	52	0	54	2	55	3	1
R2	14333 San Dieguito Rd	Residential	47	47	0	49	2	50	3	1
R3	14333 San Dieguito Rd	Residential	51	51	0	53	2	53	2	0
R4	14332 San Dieguito Rd	Golf Course	58	58	0	60	2	61	3	1
R5	14332 San Dieguito Rd	Golf Course	57	57	0	59	2	61	4	2
R6	14332 San Dieguito Rd	Golf Course	54	55	1	57	3	58	4	1
R7	14332 San Dieguito Rd	Golf Course	50	52	2	53	3	55	5	2
R8	4519 South Lane	Flood Plain/ Habitat	66	66	0	69	3	69	3	0
R9	14555 El Camino Real	Polo Grounds	57	58	1	60	3	61	4	1
R10	2847 Via De La Valle	Animal Pens	52	53	1	55	3	56	4	1
R11	14710 Via Del Canon	Residential	46	46	0	48	2	48	2	0
R12	2847 Via De La Valle	Offices	53	53	0	55	2	56	3	1
R13	3790 Via De La Valle (Tommy V's)	Commercial	64	65	1	68	4	69	5	1
R14	3665 Via De La Valle (All Creatures Pets Hospital)	Commercial	62	62	0	65	3	65	3	0
R15	3675 Via De La Valle (Mary's Tack and Feed)	Commercial	67	67	0	70	3	71	4	1
R16	3702 Via De La Valle (Market Bar and Grill)	Commercial	63	64	1	66	3	67	4	1
R17	14820 De La Valle Place	Residential	53	54	1	56	3	57	4	1
R18	14841 De La Valle Place	Residential	49	49	0	52	3	52	3	0
R19	14841 De La Valle Place	Residential	51	52	1	54	3	55	4	1
R20	14801 Fisher CV	Residential	49	51	2	53	4	54	5	1
R21	3840 Via De La Valle (Gatlin Development)	Commercial	53	54	1	58	5	58	5	0
R22	14750 El Camino Real (Casa Palmera)	Treatment Facility	56	58	2	61	5	62	6	1
R23	14805 Fisher CV	Residential	49	50	1	53	4	54	5	1
R24	5005 Rancho Del Madison	Residential	55	55	0	58	3	59	4	1
R25	14905 Arroyo Rosita	Residential	54	54	0	57	3	57	3	0

Note: Due to model accuracy noise levels are rounded to the nearest whole decibel.

TABLE 8
WESTERN ALIGNMENT TRAFFIC NOISE LEVELS

Receiver ID	Description	Use	Existing Conditions	Existing + Project		No Project Future		Cumulative + Project		
			CNEL	CNEL	Increase	CNEL	Increase	CNEL	Total Increase	Project Contribution
R1	4110 Rancho Las Brisas Trail	Residential	52	52	0	54	2	55	3	3
R2	14333 San Dieguito Rd	Residential	47	47	0	49	2	49	2	2
R3	14333 San Dieguito Rd	Residential	51	54	3	53	2	56	5	2
R4	14332 San Dieguito Rd	Golf Course	58	59	1	60	2	61	3	2
R5	14332 San Dieguito Rd	Golf Course	57	58	1	59	2	61	4	3
R6	14332 San Dieguito Rd	Golf Course	54	55	1	57	3	58	4	3
R7	14332 San Dieguito Rd	Golf Course	50	53	3	53	3	56	6	3
R8	4519 South Lane	Flood Plain/Habitat	66	68	2	69	3	70	4	2
R9	14555 El Camino Real	Polo Grounds	57	57	0	60	3	60	3	3
R10	2847 Via De La Valle	Animal Pens	52	53	1	55	3	56	4	3
R11	14710 Via Del Canon	Residential	46	45	-1	48	2	48	2	3
R12	2847 Via De La Valle	Offices	53	53	0	55	2	56	3	3
R13	3790 Via De La Valle (Tommy V's)	Commercial	64	66	2	68	4	69	5	3
R14	3665 Via De La Valle (All Creatures Pets Hospital)	Commercial	62	62	0	65	3	65	3	3
R15	3675 Via De La Valle (Mary's Tack and Feed)	Commercial	67	68	1	70	3	71	4	3
R16	3702 Via De La Valle (Market Bar and Grill)	Commercial	63	62	-1	66	3	65	2	3
R17	14820 De La Valle Place	Residential	53	54	1	56	3	57	4	3
R18	14841 De La Valle Place	Residential	49	48	-1	52	3	51	2	3
R19	14841 De La Valle Place	Residential	51	52	1	54	3	55	4	3
R20	14801 Fisher CV	Residential	49	51	2	53	4	54	5	3
R21	3840 Via De La Valle (Gatlin Development)	Commercial	53	55	2	58	5	59	6	4
R22	14750 El Camino Real (Casa Palmera)	Treatment Facility	56	59	3	61	5	62	6	3
R23	14805 Fisher CV	Residential	49	51	2	53	4	54	5	3
R24	5005 Rancho Del Madison	Residential	55	56	1	58	3	59	4	3
R25	14905 Arroyo Rosita	Residential	54	54	0	57	3	57	3	3

Note: Due to model accuracy noise levels are rounded to the nearest whole decibel.

TABLE 9
EASTERN ALIGNMENT TRAFFIC NOISE LEVELS

Receiver ID	Description	Use	Existing Conditions	Existing + Project		No Project Future		Cumulative + Project		
			CNEL	CNEL	Increase	CNEL	Increase	CNEL	Total Increase	CNEL
R1	4110 Rancho Las Brisas Trail	Residential	52	52	0	54	2	55	3	1
R2	14333 San Dieguito Rd	Residential	47	47	0	49	2	50	3	1
R3	14333 San Dieguito Rd	Residential	51	54	3	53	2	56	5	3
R4	14332 San Dieguito Rd	Golf Course	58	59	1	60	2	61	3	1
R5	14332 San Dieguito Rd	Golf Course	57	59	2	59	2	62	5	3
R6	14332 San Dieguito Rd	Golf Course	54	57	3	57	3	60	6	3
R7	14332 San Dieguito Rd	Golf Course	50	55	5	53	3	58	8	5
R8	4519 South Lane	Flood Plain/Habitat	66	68	2	69	3	70	4	1
R9	14555 El Camino Real	Polo Grounds	57	63	6	60	3	66	9	6
R10	2847 Via De La Valle	Animal Pens	52	51	-1	55	3	54	2	-1
R11	14710 Via Del Canon	Residential	46	46	0	48	2	49	3	1
R12	2847 Via De La Valle	Offices	53	52	-1	55	2	55	2	0
R13	3790 Via De La Valle (Tommy V's)	Commercial	64	67	3	68	4	70	6	2
R14	3665 Via De La Valle (All Creatures Pets Hospital)	Commercial	62	63	1	65	3	66	4	1
R15	3675 Via De La Valle (Mary's Tack and Feed)	Commercial	67	68	1	70	3	71	4	1
R16	3702 Via De La Valle (Market Bar and Grill)	Commercial	63	59	-4	66	3	62	-1	-4
R17	14820 De La Valle Place	Residential	53	55	2	56	3	58	5	2
R18	14841 De La Valle Place	Residential	49	49	0	52	3	52	3	0
R19	14841 De La Valle Place	Residential	51	53	2	54	3	56	5	2
R20	14801 Fisher CV	Residential	49	53	4	53	4	56	7	3
R21	3840 Via De La Valle (Gatlin Development)	Commercial	53	55	2	58	5	59	6	1
R22	14750 El Camino Real (Casa Palmera)	Treatment Facility	56	61	5	61	5	64	8	3
R23	14805 Fisher CV	Residential	49	52	3	53	4	55	6	2
R24	5005 Rancho Del Madison	Residential	55	56	1	58	3	59	4	1
R25	14905 Arroyo Rosita	Residential	54	55	1	57	3	59	5	2

Note: Due to model accuracy noise levels are rounded to the nearest whole decibel.

TABLE 10
ROUNDABOUTS TRAFFIC NOISE LEVELS

			Existing Conditions	Existing + Project		No Project Future		Cumulative + Project		
Receiver ID	Description	Use	CNEL	CNEL	Increase	CNEL	Increase	CNEL	Total Increase	CNEL
R1	4110 Rancho Las Brisas Trail	Residential	52	52	0	54	2	52	-2	0
R2	14333 San Dieguito Rd	Residential	47	50	3	49	2	50	1	3
R3	14333 San Dieguito Rd	Residential	51	56	5	53	2	56	3	5
R4	14332 San Dieguito Rd	Golf Course	58	60	2	60	2	60	0	2
R5	14332 San Dieguito Rd	Golf Course	57	57	0	59	2	57	-2	0
R6	14332 San Dieguito Rd	Golf Course	54	55	1	57	3	55	-2	1
R7	14332 San Dieguito Rd	Golf Course	50	52	2	53	3	52	-1	2
R8	4519 South Lane	Flood Plain/Habitat	66	64	-2	69	3	64	-5	-2
R9	14555 El Camino Real	Polo Grounds	57	61	4	60	3	61	1	4
R10	2847 Via De La Valle	Animal Pens	52	50	-2	55	3	50	-5	-2
R11	14710 Via Del Canon	Residential	46	48	2	48	2	48	0	2
R12	2847 Via De La Valle	Offices	53	54	1	55	2	54	-1	1
R13	3790 Via De La Valle (Tommy V's)	Commercial	64	62	-2	68	4	62	-6	-2
R14	3665 Via De La Valle (All Creatures Pets Hospital)	Commercial	62	65	3	65	3	65	0	3
R15	3675 Via De La Valle (Mary's Tack and Feed)	Commercial	67	70	3	70	3	70	0	3
R16	3702 Via De La Valle (Market Bar and Grill)	Commercial	63	64	1	66	3	64	-2	1
R17	14820 De La Valle Place	Residential	53	55	2	56	3	55	-1	2
R18	14841 De La Valle Place	Residential	49	51	2	52	3	51	-1	2
R19	14841 De La Valle Place	Residential	51	51	0	54	3	51	-3	0
R20	14801 Fisher CV	Residential	49	49	0	53	4	49	-4	0
R21	3840 Via De La Valle (Gatlin Development)	Commercial	53	52	-1	58	5	52	-6	-1
R22	14750 El Camino Real (Casa Palmera)	Treatment Facility	56	56	0	61	5	56	-5	0
R23	14805 Fisher CV	Residential	49	49	0	53	4	49	-4	0
R24	5005 Rancho Del Madison	Residential	55	55	0	58	3	55	-3	0
R25	14905 Arroyo Rosita	Residential	54	55	1	57	3	55	-2	1

Note: Due to model accuracy noise levels are rounded to the nearest whole decibel.

5.1.1 Central Alignment Alternative

Near-term traffic noise levels under the Central Alignment Alternative would range from 46 to 67 dBA CNEL at all receivers. Noise levels at residential land uses under would range from 46 to 55 dBA CNEL and 52 to 58 dBA CNEL at recreational areas. Commercial land uses would be exposed to noise levels ranging from 53 to 67 dBA CNEL. Noise level increases over existing conditions would range between 0 and 2 dBA at all land uses.

Horizon-year traffic noise levels under the Central Alignment Alternative would range from 48 to 71 dBA CNEL at all receivers. Traffic noise levels at residential land uses would range from 48 to 59 dBA CNEL and 55 to 61 dBA CNEL at recreational areas. Commercial land uses would be exposed to noise levels ranging from 56 to 71 dBA CNEL. Increases in noise levels over existing conditions would range between 2 and 6 dBA at all land uses, however, the project's contribution to the cumulative increase would range from 0 to 2 dBA.

City of San Diego Receptors

Receivers R1 through R12, R14, R15, R21, and R22 are located in the City. These receivers include four residences, the horse park, polo grounds, a golf course, a chemical dependency treatment facility, and several commercial land uses. R1 through R3 and R11 represent the residential land uses. R4 through R7 and R9 represent recreation uses. R4 through R7 represent the golf course, R9 represents the Polo field. R10 represents agricultural uses, i.e. animal pens. R22 represents a chemical dependency treatment facility. All other receivers are habitat or commercial land uses.

As shown in Table 7, noise levels at all residential land uses under either the near term or future conditions would comply with the City's “compatible” noise standard of 60 dBA CNEL for residential uses. Other potentially noise sensitive uses areas would include recreational uses. As indicated in Table 7, maximum CNEL values under the 2035 condition at the golf course would not exceed 61 dBA CNEL, thus near term and future levels with the proposed project would comply with the City “compatible” standard of 65 dBA CNEL for recreational land uses.

Similarly, noise levels at the polo field would not exceed the City's “compatible” standard of 65 dBA CNEL for recreational land uses. R22 is a medical treatment facility and may house patients and as shown in Table 7, noise levels under the 2035 conditions would be 62 dBA CNEL. This noise level would exceed the City's “compatible” noise standard for care facilities, however, the attenuation for exterior sources to interior locations provided by modern commercial structures is approximately 25 dBA (FHWA 2011). Thus, with an exterior noise level of 62 dBA CNEL, interior noise levels would attenuate to 37 dBA CNEL and interior noise levels would comply with City standards.

Three affected commercial uses, represented by R14, R15, and R22, are located within the City limits. Noise levels at R14 and R21 are equal to, or less than 65 dBA CNEL under the existing plus project and under the future conditions. These noise levels would comply with the City's "compatible" standard of 65 dBA CNEL for commercial uses. Receiver R15, would be exposed to noise levels of 71 dBA CNEL under near-term and future conditions. These noise levels would exceed the City's "compatible" standard for sales uses, however, as with the medical treatment facility, the structure would provide 25 dBA attenuation from exterior sources. Thus the interior noise level is anticipated to be approximately 46 dBA CNEL and interior noise levels would comply with City standards.

Noise levels increases within the City after implementation of the proposed project would range from 0 to 2 dBA under the existing plus project conditions and 2 to 6 dBA under the future conditions. As all future noise levels for all land uses would comply with the City standards, noise level increases on this order are considered less than significant.

County of San Diego Receptors

Receivers R13, R16 through R20, and R23 through R25 are located in the County of San Diego. These receivers include six residences and two commercial businesses. All County receivers are located north of Via de la Valle and east of Camino Del Real.

As shown in Table 7, noise levels at all residential land uses in the near term and future condition would comply with the County's noise compatibility standard of 60 dBA CNEL. Affected commercial uses, represented by R13 and R16, are located within the County of San Diego. Noise levels at these uses would reach up to 69 dBA CNEL under the existing plus project and under the future conditions. The County noise compatibility standard for commercial uses is 70 dBA CNEL. As the future noise levels would comply with the County noise compatibility standards, the noise impacts are considered less than significant.

Noise levels increases within the County after implementation of the proposed project would range 3 to 6 dBA under both existing plus project and under the future conditions. As all future noise levels for all land uses would comply with the County standards, noise level increases less than 10 dBA are considered less than significant.

5.1.2 Western Alignment Alternative

Near term traffic noise levels under the Western Alignment Alternative would range from 45 to 68 dBA CNEL at all receivers. Traffic noise levels at residential land uses under the near term conditions would range from 45 to 56 dBA CNEL and 53 to 59 dBA CNEL at recreational uses. Commercial land uses would be exposed to noise levels ranging from 53 to 68 BA CNEL. Changes in noise levels would range between -1 and 3 dBA at all land uses.

Horizon year traffic noise levels under the Western Alignment Alternative would range from 48 to 71 dBA CNEL at all receivers. Traffic noise levels at residential land uses under the future conditions would range from 48 to 59 dBA CNEL and 56 to 61 dBA CNEL at recreational uses. Commercial land uses would be exposed to noise levels ranging from 56 to 71 dBA CNEL. Changes in noise levels would range between 2 and 6 dBA at all land uses, however, the project's contribution to the cumulative increase would range from 2 to 4 dBA.

City of San Diego Receptors

Receivers under the Western Alignment Alternative are the same as under the Central Alignment Alternative.

As shown in Table 8, noise levels at all residential land uses in the near term and future condition would comply with the City's noise compatibility standard of 60 dBA CNEL for residential uses. Therefore, the noise impacts at residential uses would be less than significant. Other potentially noise sensitive uses areas would include recreational uses. As indicated in Table 8, maximum CNEL values under the 2035 condition at the golf course would not exceed 61 dBA CNEL, thus near term and future levels with the proposed project would comply with the City standard of 65 dBA CNEL for golf courses. Similarly, noise levels at the polo field would be 60 dBA CNEL, which would not exceed the City standard of 65 dBA CNEL. R22 is a medical treatment facility and may house patients and as shown in Table 8, noise levels under the future conditions would be 62 dBA CNEL. While this noise level would not exceed the City exterior noise standard for medical facilities, as discussed under the Central Alignment Alternative, the structure would provide approximately 25 dBA attenuation, thus the interior noise level would comply with the City standards.

Three affected commercial uses, represented by R14, R15, and R21, are located within the City limits. Noise levels at R14 and R21 would not exceed to 65 dBA CNEL under the existing plus project or future conditions. These noise levels would comply with the City's noise standards for commercial uses. R15 would be exposed to noise levels of approximately 71 dBA CNEL under the future conditions, which would exceed the City's standard of 65 dBA CNEL for sales uses. However, as previously discussed the structure would provide approximately 25 dBA of noise level reduction at interior locations from exterior noise sources. Therefore, the interior noise levels would be approximately 46 dBA CNEL, which would comply with City standards.

Changes in noise levels within the City after implementation of the proposed project would range from -1 to 3 dBA under the existing plus project conditions and 2 to 6 dBA under the future conditions. As future noise levels for all land uses would comply with the City standards, noise level increases on this order are considered less than significant.

County of San Diego Receptors

Receivers under the Western Alignment Alternative are the same as under the Central Alignment Alternative.

As shown in Table 8, noise levels at residential land uses would range from 48 to 56 dBA CNEL in the near term and 51 to 59 dBA CNEL under future conditions, which would comply with the County's noise compatibility standard of 60 dBA CNEL.

Commercial uses, represented by R13 and R16, are located within the County of San Diego. Noise levels at these uses would reach up to 66 dBA CNEL under the existing plus project conditions and 69 dBA CNEL under the future conditions. These noise levels would comply with the County's standard of 70 dBA CNEL for commercial retail uses.

Changes in noise levels within the County after implementation of the proposed project would range -1 to 2 dBA under the existing plus project conditions and 2 to 5 dBA under the future conditions. As all future noise levels for all land uses would comply with the County standards, noise level increases less than 10 dBA are considered less than significant.

5.1.3 Eastern Alignment Alternative

Near-term traffic noise levels under the Eastern Alignment Alternative would range from 46 to 68 dBA CNEL at all receivers. Traffic noise levels at residential land uses would range from 46 to 56 dBA CNEL and 55 to 63 dBA CNEL at recreational uses. Commercial land uses would be exposed to noise levels ranging from 52 to 68 dBA CNEL. Changes in noise levels would range between -4 and 6 dBA at all land uses.

Horizon Year traffic noise levels under the Eastern Alignment Alternative would range from 49 to 71 dBA CNEL at all receivers. Traffic noise levels at residential land uses would range from 49 to 59 dBA CNEL and 58 to 66 dBA CNEL at recreational uses. Commercial land uses would be exposed to noise levels ranging from 55 to 71 dBA CNEL. Changes in noise levels would range between -1 and 9 dBA at all land uses.

City of San Diego Receptors

Receivers under the Eastern Alignment Alternative are the same as under the Central Alignment Alternative.

As shown in Table 9, noise levels at all residential land uses would range from 46 to 54 dBA CNEL in the near term and 49 to 56 dBA CNEL under future conditions. These noise levels would comply with the City's noise compatible standard of 60 dBA CNEL for residential uses.

Other potentially noise sensitive uses areas would include recreational uses. As indicated in Table 9, maximum CNEL values under the future condition at the golf course would not exceed 62 dBA CNEL, thus near term and future levels with the proposed project would comply with the City standard of 65 dBA CNEL for golf courses. Noise levels at the polo field and horse-park would be approximately 66 dBA CNEL, which would exceed the City standard of 65 dBA CNEL for recreational uses. However, the exceedance is primarily due to the proximity of the receiver to the roadway as the roadway would be moved partially onto the existing polo field and does not include the majority of the area. Additionally, the movement of the roadway would require reconfiguration of the polo field. Therefore, during reconfiguration of the polo field the City will verify the reconfiguration locates use areas are exposed to noise levels equal to or less than 65 dBA CNEL.

R22 is a medical treatment facility and may house patients and as shown in Table 9, noise levels under the future build condition would be 64 dBA CNEL. This noise level is compatible with the City's noise standard and noise impacts would be less than significant.

Commercial uses located within the City limits are represented by R14, R15, and R21. Noise levels at R14 and R21 would comply with the City's exterior noise compatibility standard of 65 dBA CNEL. Noise levels at R15 could reach up to 68 dBA CNEL under the existing plus project conditions and 71 dBA CNEL under the future conditions. These noise levels would exceed the City's exterior noise standard of 65 dBA CNEL for commercial sales uses. However, as previously discussed the structure would provide approximately 25 dBA of noise level reduction at interior locations from exterior noise sources. Therefore, the interior noise levels would be approximately 46 dBA CNEL, which would comply with City's interior noise standards.

Changes in noise levels within the City after implementation of the proposed project would range from -1 to 6 dBA under the existing plus project conditions and 2 to 9 dBA under the future conditions. As all future noise levels for all land uses would comply with the City standards, noise level increases on this order are considered less than significant.

County of San Diego Receptors

Receivers under the Eastern Alignment Alternative are the same as under the Central Alignment Alternative.

As shown in Table 9, noise levels at all residential land uses in the near term and future condition would comply with the County's noise compatibility standard of 60 dBA CNEL. Noise levels at R13 and R16 would reach up to 67 dBA CNEL under the existing plus project conditions and 70 dBA CNEL under the future conditions. These noise levels would comply with the City's standard of 70 dBA CNEL for commercial retail uses.

Noise levels increases within the County after implementation of the proposed project would range -4 to 4 dBA under the existing plus project conditions and -1 to 7 dBA under the future conditions. As all future noise levels for all land uses would comply with the County standards, noise level increases less than 10 dBA are considered less than significant.

5.1.4 Roundabout Alternative

Near term traffic noise levels under the Roundabout Alternative would range from 48 to 70 dBA CNEL at all receivers. Traffic noise levels at residential land uses would range from 48 to 56 dBA CNEL and 52 to 61 dBA CNEL at recreational uses. Commercial land uses would be exposed to noise levels ranging from 52 to 70 dBA CNEL. Changes in noise levels would range between -2 and 5 dBA at all land uses.

Horizon Year traffic noise levels under the Roundabout Alternative would range from 48 to 70 dBA CNEL at all receivers. Traffic noise levels at residential land uses would range from 48 to 56 dBA CNEL and 52 to 61 dBA CNEL at recreational uses. Commercial land uses would be exposed to noise levels ranging from 52 to 70 dBA CNEL. Changes in noise levels would range between -6 and 3 dBA at all land uses.

City of San Diego Receptors

Receivers under the Roundabout Alternative are the same as under the Central Alignment Alternative.

As shown in Table 10, noise levels at all residential land uses in the near term and future condition would comply with the City's noise compatibility standard of 60 dBA CNEL for residential uses. Therefore, the noise impacts at residential uses would be less than significant.

Other potentially noise sensitive uses areas would include recreational uses. As indicated in Table 10, maximum CNEL values under the future condition at the golf course would not exceed 60 dBA CNEL, thus near term and future levels with the proposed project would comply with the City standard of 65 dBA CNEL for golf courses.

Similarly, noise levels at the polo field and horse-park would not exceed the City standard of 65 dBA CNEL.

R22 is a medical treatment facility and may house patients and as shown in Table 10, noise levels under the future build condition would be 56 dBA CNEL. This noise level is compatible with the City's noise standard and noise impacts would be less than significant.

Commercial uses located within the City limits are represented by R12, R14, R15, and R21, are. Noise levels at R12, R14, and R21 would not exceed 65 dBA CNEL, which would be compatible with City standards. Noise levels at R15 would reach up to 70 dBA CNEL under the existing plus project conditions and the future conditions. These noise levels would exceed the City's exterior noise standard of 65 dBA CNEL for commercial sales uses. However, as previously discussed the structure would provide approximately 25 dBA of noise level reduction at interior locations from exterior noise sources. Therefore, the interior noise levels would be approximately 45 dBA CNEL, which would comply with City standards.

Noise levels increases within the City after implementation of the proposed project would range from -2 to 5 dBA under the existing plus project conditions and -6 to 3 dBA CNEL under future conditions at all receivers. As all future noise levels for all land uses would comply with the City standards, noise level increases on this order are considered less than significant.

County of San Diego Receptors

Receivers under the Roundabout Alternative are the same as under the Central Alignment Alternative. As shown in Table 10, all residential land uses in the near term and future condition would comply with the County's noise compatibility standard of 60 dBA CNEL.

Commercial uses located within the County of San Diego are represented by R13 and R16. Noise levels at these uses would reach up to 64 dBA CNEL under the existing plus project conditions and under future conditions. These noise levels would comply with the County's standard of 70 dBA CNEL for commercial retail uses.

Changes in existing noise levels within the County after implementation of the proposed project would range -2 to 1 dBA under the existing plus project conditions and -6 to -1 dBA under the future conditions. As all future noise levels for all land uses would comply with the City standards, noise level increases less than 10 dBA are considered less than significant.

5.1.5 Wildlife Habitat

Future operations noise levels at habitat locations are based on noise levels modeled at R8. Based on the existing modeled data ambient noise levels are approximately 66 dBA CNEL, as the loudest hour is equal to the CNEL, this also represents the loudest hourly ambient noise level. Based on Tables 7 through 10, a cumulative noise level increase of 3 dBA is anticipated without implementation of any build alternative.

Based on the results reported in Table 7, the Central Alignment Alternative would result in an approximate 3 dBA increase under the existing plus project and under future conditions; however, due to future traffic increase not associated with the project, the Central Alignment Alternative represents an approximate 1 dBA contribution to the cumulative increase.

Based on the results reported in Table 8, the Western Alignment Alternative would result in an approximate 2 dBA increase under the existing plus project and approximately 4 dBA under future conditions. Due to increase in future traffic with or without the project, the, Western Alignment Alternative represents an approximate 2 dBA contribution to the cumulative increase.

Based on the result reported in Table 9, the Eastern Alignment Alternative would result in an approximate 2 dBA increase under the existing plus project and 4 dBA under future conditions. Due to increase in future traffic with or without the project, the Eastern Alignment Alternative represents an approximate 1 dBA contribution to the cumulative increase.

Based on the result reported in Table 10, the Roundabouts Alternative would result in a -2 dBA increase under the existing plus project and -5 dBA under future conditions. The large decrease is due to increase in future traffic without the project along the existing alignment and standard traffic controls. The Roundabouts Alternative would not contribution to a cumulative increase in traffic noise levels at R8.

Based on the City’s CEQA Significance Determination Thresholds, the Western and Eastern Alignment Alternatives would result in an increase in ambient noise levels that would exceed 60 dBA. The Central Alignment Alternative would not result in an increase greater than that anticipated without the proposed project, while the Roundabouts Alternative would result in a decrease in ambient noise levels even with the increase in traffic volumes. Thus, the Central Alignment and Roundabouts Alternatives would result in noise levels which would exceed the threshold. However, the determination of significance of noise impacts to biological resources is not within the scope of this noise analysis and the information presented is only for informational purposes and the determination of any biological impacts should be referred to the project’s Natural Environmental Study.

5.2 Construction Noise Impacts

For purposes of noise assessment, construction equipment can be considered to operate in two modes: stationary and mobile. Stationary equipment operates in one location for 1 or more days at a time with either a fixed-power operation, such as pumps, generators, and compressors, or a variable noise operation, such as pile drivers, rock drills, and pavement breakers. Mobile equipment moves around the construction site with power applied in a cyclic fashion, such as bulldozers, graders, and loaders (FTA 2006). Noise impacts from stationary equipment are assessed from the center of the equipment, while noise impacts for mobile construction equipment are assessed from the center of the equipment activity or construction site. For linear construction, such as a roadway or pipeline, construction noise is assessed from the centerline of the alignment and center of the active work area.

Variation in power imposes additional complexity in characterizing the noise source level from construction equipment. Power variation is accounted for by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the L_{eq} of the operation (FTA 2006). Typical duty cycles and noise levels generated by representative pieces of equipment are listed in Table 11.

Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some will have higher continuous noise levels than others, and some have high-impact noise levels. The L_{eq} of each phase is determined by combining the L_{eq} contributions from each piece of equipment used in that phase (FTA 2006). In typical construction projects, grading activities typically generate the highest noise levels, as grading involves the largest equipment.

Construction noise would be generated by diesel engine-driven construction equipment, which would be used for site preparation; excavation and grading; delivery and application of fill; subgrade, asphalt, and concrete material; and installation of medians, barriers, signage, etc. Diesel engine-driven trucks would bring materials to the site and remove spoils from excavation. Peak noise levels may be 85 to 90 dBA at a distance of 50 feet during most construction activities, and hourly average noise levels at 50 feet from the edge of the work area would be anticipated to be 70 to 80 dBA L_{eq}.

TABLE 11
TYPICAL CONSTRUCTION NOISE LEVELS

Equipment	Noise Level at 50 Feet	Typical Duty Cycle
Auger Drill Rig	85	20%
Backhoe	80	40%
Blasting	94	1%
Chain Saw	85	20%
Clam Shovel	93	20%
Compactor (ground)	80	20%
Compressor (air)	80	40%
Concrete Mixer Truck	85	40%
Concrete Pump	82	20%
Concrete Saw	90	20%
Crane (mobile or stationary)	85	20%
Dozer	85	40%
Dump Truck	84	40%
Excavator	85	40%
Front End Loader	80	40%
Generator (25 KVA or less)	70	50%
Generator (more than 25 KVA)	82	50%
Grader	85	40%
Hydra Break Ram	90	10%
Impact Pile Driver (diesel or drop)	95	20%
Insitu Soil Sampling Rig	84	20%
Jackhammer	85	20%
Mounted Impact Hammer (hoe ram)	90	20%
Paver	85	50%
Pneumatic Tools	85	50%
Pumps	77	50%
Rock Drill	85	20%
Scraper	85	40%
Tractor	84	40%
Vacuum Excavator (vac-truck)	85	40%
Vibratory Concrete Mixer	80	20%
Vibratory Pile Driver	95	20%

Source: Thalheimer 2000 KVA = kilovolt amps

Construction of the bridge is likely to concentrate a number of pieces of equipment in a relatively small area. Therefore, a source noise level of 86 dBA L_{eq} at 50 feet at the bridge area is considered appropriate (FHWA 2004). Average noise levels over longer periods of time would be less. Construction equipment noise is considered to be a “point source” and attenuated over distance over hard surfaces at a rate of 6 dBA for each doubling of distance. Thus, a noise level of 80 dBA at 50 feet would be 74 dBA at 100 feet and 68 dBA at 200 feet from the source. Noise attenuation would be greater over soft, absorbent surfaces, such as grass, with the reduction of noise up to 7.5 dBA for each doubling of distance (FTA 2006).

The nearest sensitive receptors to the work areas are the rear of the home at 14841 De La Valle Place, behind the Polo Plaza (R18), and the residence on San Dieguito Road (R2). R18 is approximately 250 feet from the planned construction area. An existing wall prevents a direct line of sight from R18 to Via de la Valle and provides additional noise attenuation. Hourly noise levels would be approximately 66 dBA L_{eq}, and maximum noise levels would not be anticipated to exceed 76 dBA L_{max}. For many operations, the existing wall would break the line of sight, the noise reduction would be greater, and the noise levels at the residence would be less than the indicated maximum values (EDAW 2006).

R2 is approximately 100 feet from the planned widening area. Existing structures prevent a direct line of sight from R2 to San Dieguito Road. In the back yard, hourly average noise levels would be approximately 64 dBA L_{eq} and maximum noise levels would be approximately 74 dBA L_{max}. While the front of the residence would be directly exposed to the construction, hourly average noise levels are not anticipated to exceed 74 dBA L_{eq} and maximum noise levels would be approximately 84 dBA L_{max}. Additionally, construction equipment noise would be heard above the normal traffic noise at all of the businesses and recreation areas adjacent to the project roadways; however, neither the noise level limits of the City nor County noise ordinances would be exceeded.

R2 and R18 are located at the south and north ends of the project area. Construction at the these locations, and the associated noise, would occur for short durations while the majority of the construction work would occur at greater distances along El Camino Real with lower noise levels than those discussed above.

No nighttime construction is anticipated on this project (EDAW 2006). Therefore, no nighttime active construction noise would be expected. Nighttime impacts can occur if warning signs or traffic control devices driven by internal combustion engines are operating near sensitive receptors. A measure to avoid or minimize this impact is included below.

Construction noise impacts can also occur from staging areas or engine-driven warning devices. Even when construction is not anticipated to occur during nighttime hours, signs or signals are often required during all hours to warn drivers of open trenches or other hazards. If these devices are powered by internal combustion engines, they can be a source of nuisance noise and can cause adverse impacts. A measure to avoid or minimize this impact is included below.

5.2.1 Wildlife Habitat

Construction activities should be avoided during the nesting/breeding season where possible. Please refer to the project's Natural Environmental Study for more details, including noise analysis with recommended measures such as preconstruction nesting surveys and noise attentuation for grading or other construction during the breeding season.

6.0 Noise Abatement Measures

6.1 Traffic Noise

No traffic noise impacts were identified, thus no traffic noise abatement measures are required or recommended.

6.2 Construction Noise

No construction noise impacts were identified; thus, no construction noise abatement measures are required, however, the following measures are recommended:

1. Each internal combustion engine should be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine should be operated on the project without said muffler.

2. Staging areas should be located at least 500 feet from occupied residential units. Work in staging areas that generates loud noises, such as equipment maintenance, should not occur during the hours prohibited for construction work.

3. If traffic control and construction signs that require power for lighting or flashing are located near residential units, the source of power should be batteries, solar cells, or another quiet source. Gas- or diesel-fueled internal combustion engines should not be used.

4. Pile driving and explosives blasting will be restricted to the hours of 8:00 a.m. to 5:00 p.m. Monday through Friday and will not be allowed on Saturdays, Sundays, or holidays.

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APPENDICES

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APPENDIX A
NOISE MEASUREMENT DATA

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APPENDIX B
TRAFFIC DATA

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APPENDIX C
TNM EXISTING AND 2035 NO BUILD

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APPENDIX D
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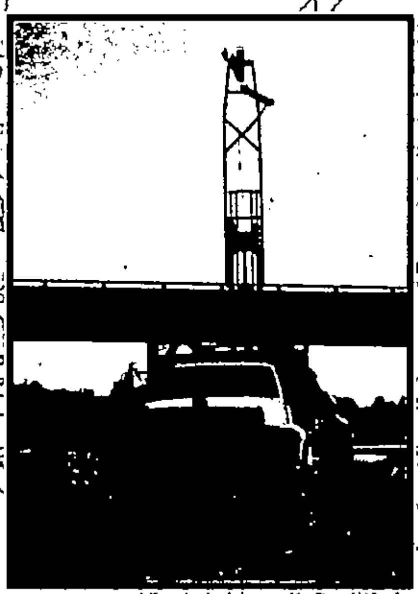

Geotechnical

and

Environmental

Sciences

Consultants

Ninyo & Moore

Ninyo & Moore
Geotechnical and Environmental Sciences Consultants

REVISED GEOTECHNICAL REPORT
EL CAMINO REAL/SAN DIEGUITO
RIVER BRIDGE PROJECT
SAN DIEGO, CALIFORNIA

PREPARED FOR:
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August 14, 1998
(Revised June 17, 2005)
Project No. 103645001

August 14, 1998
(Revised June 17, 2005)
Project No. 103645001

Mr. Edgar A. Camerino, P.E.
Rick Engineering Company
5620 Friars Road
San Diego, California 92110

Subject: Revised Geotechnical Report
El Camino Real/San Dieguito River Bridge Project
San Diego, California

Dear Mr. Camerino:

Transmitted herewith is our report titled "Revised Geotechnical Report, El Camino Real/San Dieguito River Bridge Project, San Diego, California," which has been revised from an earlier version presented to Earth Tech on August 14, 1998. This revision was conducted in accordance with our subcontract agreement dated June 8, 2005, as authorized by your firm.

This report presents the findings of our subsurface evaluation, which was performed to provide criteria for the design and construction of the proposed improvements. Our conclusions and recommendations are presented herein.

We appreciate the opportunity to be of service on this project. If you have questions regarding this report, please contact the undersigned.

Respectfully submitted,
NINYO & MOORE

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Distribution: (10) Addressee

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1. INTRODUCTION

In accordance with your request and our proposal, we have performed a geotechnical evaluation for the proposed replacement of the El Camino Real Bridge over the San Dieguito River in San Diego, California (Figure 1). This project is part of a proposed widening of El Camino Real between Via De La Valle and San Dieguito Road. A geotechnical report for the road widening has also been prepared by Ninyo & Moore (1998) and will be submitted under separate cover. This report presents our findings, conclusions, and geotechnical recommendations regarding the design and construction of the bridge widening.

2. SCOPE OF SERVICES

Our scope of services included the following:

- Review of readily available published and in-house geotechnical literature, including as-built bridge plans, Caltrans Soil Survey Sheets, topographic maps, geologic maps, fault maps, and stereoscopic aerial photographs.
- Field reconnaissance to observe site conditions and to locate and mark proposed exploratory excavations and cone penetrometer test (CPT) soundings.
- Coordinating and mobilizing for the subsurface exploration. Mark-out of existing underground utilities was conducted through Underground Service Alert.
- Performance of a subsurface evaluation consisting of the excavation, logging, and sampling of six small-diameter exploratory borings and performing two CPT soundings for the bridge site. Borings B-3 and B-4 were drilled with a hollow-stem auger drill rig to depths of approximately 27.4 meters (m) and 29.4 m, respectively. Borings B-7, B-8, B-9, and B-10 were advanced with a hand auger system to the depth of groundwater. Soundings CPT-1 and CPT-2 were extended to depths of approximately 32.3 m and 33.8 m, respectively. The CPT soundings were performed with a truck-mounted CPT rig pushing a 9-tonne capacity cone. Four other borings (B-1, B-2, B-5, and B-6) pertain to the roadway widening evaluation (Ninyo & Moore, 1998), and are not included in this report.
- Laboratory testing of selected samples including in-place moisture content and dry density, gradation, Atterberg limits, direct shear, consolidation, and corrosivity.
- Data compilation and engineering analyses of the information obtained from the background review, subsurface evaluation, and laboratory testing. Our engineering analyses included the analysis of seismic design criteria, potential for liquefaction and lateral spread, design earth pressures, corrosion potential, and design criteria for bridge foundations.

- Preparation of this report to present our conclusions and geotechnical recommendations for the proposed project.

Our scope of services did not include an evaluation of environmental considerations at the site. If an environmental evaluation is needed, a detailed scope of proposed environmental services and an estimated fee for such services will be provided upon request.

3. SITE DESCRIPTION AND PROPOSED CONSTRUCTION

The planned improvements will include widening of El Camino Real to a four-lane major road, and replacing the existing bridge over the San Dieguito River. El Camino Real and the bridge over the San Dieguito River will be designed and constructed as a modified four-lane major road. The design will include curb, gutter, sidewalk, bike lanes, equestrian trails, and crossings, landscaped medians with turn lanes, and traffic signals at intersections.

The existing bridge over San Dieguito River was constructed in 1940 as an approximately 104 m long by 8 m wide, nine-span reinforced concrete haunched T-girder bridge supported on pier walls with driven concrete pile foundations. The bridge does not have abutment supports; rather, it has short cantilever end spans for approach and departure ramps. Ground elevations in the vicinity of the bridge vary from approximately 1-m above Mean Sea Level (MSL) in the riverbed, to approximately 4 m MSL at the top of the riverbanks and approximately 8 m MSL at the top of the approach embankments. In 1983, a riprap pad and channel slope protection was added to the bridge site to protect the bridge from damage due to scour. Based on as-built drawings, the riprap pad consisted of excavating the riverbed to an elevation of 0 m MSL and placing a 610-mm thick blanket of rock. The drawings indicate the bridge pile cap soffit is also at an elevation of 0 m MSL. The plans indicate the pad was placed under the bridge and also extends upstream (east) 30 m from the bridge. The channel slope protection extended up the riverbanks at an inclination of 1:1.5 (vertical:horizontal) or flatter, and consisted of a 610-mm thick blanket of light riprap over a filter blanket.

4. FIELD EXPLORATION

Our subsurface evaluation at the site consisted of advancing six exploratory small-diameter borings on May 12 through May 15, 1998, and advancing two CPT soundings on July 15, 1998. The purposes of the borings and soundings were to collect soil samples and to evaluate the foundation characteristics of the underlying soils.

Borings B-3 and B-4 were drilled to depths of approximately 27.4 m and 29.4 m, respectively. Soundings CPT-1 and CPT-2 were extended to depths of approximately 32.3 m and 33.8 m, respectively. The borings were excavated with 200-mm diameter hollow stem auger and the CPT soundings were performed with a truck-mounted CPT rig pushing a 9-tonne capacity cone. Four other borings (B-1, B-2, B-5 and B-6) pertain to the roadway widening evaluation (Ninyo & Moore, 1998b), and are not included in this report. The approximate locations of the borings and CPT soundings are indicated on the Site Plan and Log of Test Boring Sheets (Figure 2 and Sheets 1 and 2). The borings were continuously logged by a representative of our firm. Relatively undisturbed and bulk samples were obtained at selected intervals and transported to our laboratory for testing.

Additional four exploratory small-diameter borings were performed on June 13, 2005. The purpose of the borings was to provide subsurface data with respect to groundwater elevations (depths) at the site. Borings B-7, B-8, B-9, and B-10 were advanced with a hand auger system to depth of groundwater. Selected bulk soil samples were collected for sample identification. The approximate locations of the borings are indicated on the site plan. Detailed logs of the borings are presented in Appendix C.

5. LABORATORY TESTING

Laboratory testing of representative soil samples included in-situ moisture content and dry density, direct shear, gradation, Atterberg limits, consolidation, and corrosivity tests.

The results of the moisture content and dry density tests are recorded on the Log of Test Boring Sheets. The other laboratory test results, including plots of the direct shear data, are presented in

Appendix A. A summary of laboratory testing performed, including test type, designation, and number of tests performed, is presented in Table 1.

Table 1 – Laboratory Testing

Number of Tests Performed	Type of Test	Test Designation
7	Moisture and Density	ASTM D 2937-94
11	Moisture	CT 226
8	Sieve Analysis	CT 202 & 203
4	Atterberg Limits	CT 204
1	Consolidation	CT 219
4	Direct Shear	CT 222
2	Corrosivity	CT 417, 422 and 643

6. GEOLOGY AND SUBSURFACE CONDITIONS

The following sections describe geologic, soil, and groundwater conditions at the bridge site. Faulting, seismicity, and liquefaction potential at the site are also addressed.

6.1. Site Geology

Based on our geologic reconnaissance, our subsurface exploration, and review of published geologic maps of the area, as well as our review of stereoscopic aerial photographs, the geologic units present in the study area consist of fill and alluvium.

6.1.1. Fill

Fill soil was encountered in boring B-3 to a depth of 1.5 m. The fill consisted of dark brown, moist, firm sandy clay.

6.1.2. Alluvium

Alluvium was encountered in boring B-3 underlying the fill and in boring B-4 to the total depth explored. The material consisted of dark brown to dark gray and black, moist to saturated, very loose to dense, silty to clayey sand and fine sand, and saturated, very soft to soft, silty clay to clayey silt.

6.2. Groundwater

Groundwater was encountered at elevations ranging from +1.4 to +2.6 m MSL. Fluctuations in groundwater levels may occur due to storm water flow in the San Dieguito River and due to variations in ground surface topography, subsurface geologic conditions, rainfall, irrigation, and other factors.

6.3. Geologic Constraints

Geologic constraints, which may have an impact on the proposed improvements are described in the following sections.

6.3.1. Faulting and Seismicity

The subject site is considered to be in a seismically active area. Based on our review of referenced geologic maps and stereoscopic aerial photographs, no active faults are known to cross the subject site. Table 2 lists known active and potentially active fault zones within approximately 100 km of the site, the estimated maximum credible seismic events that could occur on these faults and the predicted ground accelerations at the site associated with these events.

Table 2 – Seismic Parameters for Maximum Credible Earthquakes

Fault	Fault-to-Site Distance (km)[1]	Maximum Credible Earthquake Magnitudes[1]	Estimated Acceleration (g)	
			Peak Horizontal Bedrock[2]	Repeatable High Ground[3]
Agua Blanca–Coronado Bank	27	7.7	0.28	0.18
Newport Inglewood	62	7.0	0.07	0.07
Offshore Zone of Deformation	30	7.0	0.16	0.10
Point Loma	24	6.5	0.15	0.10
Rose Canyon	6	7.0	0.47	0.30
San Clemente	83	7.3	0.05	0.05
San Diego Trough	44	7.7	0.19	0.19
San Miguel–Vallecitos	77	7.0	0.05	0.05
Whittier–Elsinore	50	7.5	0.13	0.13

Notes:
[1] After Anderson et al., 1989, and Mualchin and Jones 1992
[2] Mualchin and Jones 1992
[3] Ploessel and Slosson 1974

Seismic hazards at the site can be attributed to ground shaking resulting from events on active faults. In general, seismic hazards might include strong ground motion, liquefaction, lateral spread, ground surface rupture, and damage caused by seismically induced settlement. These potential hazards are discussed in the following sections.

6.3.2. Strong Ground Motion

Analysis of possible earthquake accelerations associated with the assigned maximum credible earthquake indicates that a significant seismic event at the site would be a magnitude 7.0 earthquake on the Rose Canyon fault located approximately 6 km west of the site. The estimated peak horizontal acceleration produced at the site by such an event would be approximately 0.47g with a repeatable high ground acceleration of 0.30g. The Caltrans California Seismic Hazard Map (Mualchin, 1996) indicates that the site has the potential for a 0.5g peak acceleration. Therefore, based on the proximity to active and potentially active faults capable of producing large earthquakes, the subject site has a high potential for experiencing strong ground motion. The geotechnical literature and our experience with the formational materials in the general site area indicate that shear wave velocities of less than 760 meters per second should be expected within the on-site earth units. Therefore, based on the referenced geotechnical information, and our experience, in our opinion, the bridge may be analyzed using the ARS response spectra for greater than 45 m of alluvium.

The distance of the proposed structures from the nearest fault is less than 15 km, and therefore, the following adjustments should be made to account for the near fault effect:

- Spectral acceleration should be increased by 20% for periods equal to and greater than 1.0 second;
- No changes need to be made to spectral acceleration for periods less than 0.5 second;
- A linear interpolation for spectral acceleration between periods of 0.5 and 1.0 second.

The geotechnical literature and our experience with the formational materials in the general site area indicate shear wave velocities of less than 760 m/s should be expected within these units to a depth of 75 m or deeper. Caltrans seismic design criteria recommends further modifications to the ARS curves for deep soil sites. However, since the El Camino Real Overcrossing has a fundamental period of vibration of less than 1.5 seconds, further adjustments should not be made.

The ARS curve for analysis of the overcrossing structure is shown on Figure 3. The curve has been adjusted for near fault effects as discussed above.

6.3.3. Ground Surface Rupture

Ground surface rupture due to faulting is considered unlikely at the bridge site due to the absence of known active and potentially active faults at the site. The potential for lurching or cracking of the surface as a result of nearby or distant seismic events is also considered unlikely.

6.3.4. Liquefaction and Dynamic Settlement

Liquefaction of cohesionless soils can be caused by strong vibratory motion due to earthquakes. Research and historical data indicate that loose granular soils (with silt contents less than approximately 35 percent and clay contents less than approximately 20 percent) which are saturated by a relatively shallow groundwater table are susceptible to liquefaction. Due to the presence of a shallow groundwater table and relatively loose granular soils at the site, the potential for liquefaction is considered to be high. Our evaluation of site conditions indicates liquefaction may occur at elevations of 0 to 6 m below MSL and at elevations of 13 to 17 m below MSL within layers of loose and sandy alluvium in the event of a major earthquake on a nearby fault. We estimate that liquefaction could induce approximately 50 to 300 mm of dynamic settlement at the site. CPT-1 encountered loose sandy material at elevations of 0 to 6 m and 13 to 17 m below MSL, while CPT-2 encountered much less liquefiable material, at elevations of 1.6 to 2.3 m below MSL. Based on our subsurface exploration, the potential for liquefaction and dynamic settlement is expected to be variable across the site, based on the variable and sinuous deposition of sandy river channel deposits across the river valley.

6.3.5. Lateral Spread

Lateral spread is a liquefaction-induced ground failure in which blocks of mostly intact surface soil displace downslope or towards a free face along a shear zone that has formed within the liquefied sediment. The potential for lateral spread of the bridge approach embankments was evaluated based on a method described by Bartlett and Youd (1995). Our evaluation assumed liquefaction of a 6-m thick soil layer below an 8-m high embankment. Based on our evaluation, the bridge approach embankments may be susceptible to horizontal ground displacements of roughly one to several meters as a result of liquefaction-induced lateral spread in the event of a major nearby earthquake. Various mitigative measures that may be considered to reduce the potential for lateral spread are discussed in the recommendations section of this report.

7. CONCLUSIONS

Based on the results of our geotechnical evaluation, it is our opinion that the proposed El Camino Real Bridge over the San Dieguito River project is feasible from a geotechnical standpoint provided that the recommendations presented in this report are incorporated into its design and construction. Major factors, which may affect the construction of the proposed project include:

- The bridge site is underlain by fill soils and alluvium. The alluvium consists of loose sands and soft silts and clays. Recommendations are provided herein for the bridge improvements to be founded on driven precast prestressed concrete piles.

- Due to the presence of shallow groundwater, and the loose and granular nature of the soils, the alluvium may be subject to liquefaction, dynamic settlement and lateral spread if subjected to shaking due to the design earthquake. Based on our calculations, should liquefaction occur, resulting dynamic settlement may be on the order of up to 300 mm, and lateral spread may cause horizontal ground displacements of the approach embankments of roughly one to several meters.

- Based on the results of resistivity and chloride content testing performed on selected samples, the site soils may be considered to be severely corrosive to ferrous materials. In accordance with Caltrans guidelines, the project site may be considered to be corrosive.

8. RECOMMENDATIONS

Based on the results of our subsurface evaluation and our understanding of the proposed construction, we present the following geotechnical recommendations relative to the design and construction of the proposed improvements.

8.1. Approach Embankments

The geotechnical report for the roadway widening is being presented under separate cover. Based on our subsurface exploration program, approach embankments at the site will be underlain by alluvium. Our analyses indicate that long-term settlement, as a result of placing embankment fill for the approach embankment, may be up to approximately 400 mm for the approach embankments. Approximately half of the settlement is anticipated to occur during grading. Based on our analyses and understanding of the proposed improvements, monitoring of embankment settlements may be needed. If ground improvement methods discussed in the following section are implemented, long-term settlements may be substantially reduced.

Our analyses were based on the assumption that existing fills and the upper 0.3-m of surficial soil will be excavated and the suitable excavated material will be moisture conditioned, placed, and compacted to 95 or more percent relative compaction in accordance with California Test Method (CTM) 216. Approach embankments should be constructed in accordance with the recommendations presented in Section 19-5.03 of the Standard Specifications (Caltrans, 1995b) and the project geotechnical report. Embankment within 40 m of abutments should be compacted to 95 or more percent relative compaction in accordance with CTM 216. Slopes built in accordance with these recommendations at an inclination of 1:2 or flatter should be stable against both deep-seated and surficial failures. To reduce the potential for erosion, we recommend that slopes be planted with drought-tolerant vegetation as soon as practicable after grading. Abutment slopes beneath the bridge may be paved to protect against erosion.

Structure approach slabs should be provided. Approach slabs should be designed and constructed in accordance with the recommendations of Section 5-3 of the Memo To Designers (Caltrans, 1995d) and Section 610.3 of the Highway Design Manual (Caltrans, 1995c).

8.2. Ground Improvement

As discussed above, the sandy alluvium at the site may be subject to liquefaction, dynamic settlement and lateral spread if subjected to shaking due to the design earthquake. Based on our calculations, should liquefaction occur, resulting dynamic settlement may be on the order of up to 300 mm, and lateral spread may cause horizontal ground displacements of the approach embankments of roughly one to several meters. If these effects are not tolerable for the planned structure, the use of in-situ ground improvement at the site may be considered. Possible ground improvement methods that may be appropriate at the site include vibro-densification, vibro-replacement (stone columns) and deep dynamic compaction. The purpose of these methods would be to densify the loose alluvium and remove its potential for liquefaction and associated dynamic settlement and lateral spread. The ground improvement plan should be evaluated by a specialty contractor. If requested, we can consult with specialty contractors, and provide a subsurface model to assist in developing an appropriate ground improvement scheme.

8.3. Foundations

We have evaluated several foundation systems for support of the El Camino Real Bridge, including spread foundations, driven steel H-piles and prestressed concrete piles, and cast-in-drilled-hole (CIDH) concrete piles. Based on our subsurface evaluation and laboratory testing, construction and site access considerations, and discussions with TY Lin International, we recommend these structures be supported on CIDH piles. Due to the relatively shallow groundwater table and the potential for soils to cave, the use of CIDH piles will need casing.

Strength parameters for analysis of foundations were obtained from laboratory test results, field SPT and CPT penetration resistance data and our professional experience. The material properties of the fill and alluvium materials used in the analysis are presented in Table 3.

Table 3 – Material Properties

Material Type	Total Unit Weight (kN/m³)	Saturated Unit Weight (kN/m³)	Cohesion (kPa)	Angle of Internal Friction (degrees)
Fill	18.5	NA	10.0	32
Alluvium – Sand	19.2	19.2	4.0	32
Alluvium – Clayey Silt	18.5	18.5	25.0	22
Alluvium – Soft Clayey Silt	17.3	17.3	11.0	20

8.3.1. Existing Bridge Foundation

Based on as-built drawings, we understand that the existing bridge is a multi-span concrete structure supported on 380-mm square by 10 m long driven precast concrete piles. The as-built drawings indicate a minimum bearing value of 507 kN per pile and a pile cap soffit elevation of 0 m (MSL). Estimates of the ultimate axial capacities, ultimate uplift resistances, lateral capacity, and induced settlements of the pile foundations were made using the methods of analyses developed by the Federal Highway Administration (1993).

The ultimate capacities for the existing piles are based on side friction for the downward and uplift vertical capacity. Based on our subsurface exploration, the alluvial soils may have a potential for liquefaction, particularly at elevations of 0 to 6 m below MSL and at elevations of 13 to 17 m below MSL, should the design seismic event occur. Liquefaction in the upper zone significantly reduces the ability of the pile foundation to resist lateral loading.

Table 4 presents the estimated ultimate downward and uplift capacities for the existing piles. The uplift capacities represent 50 percent of the downward frictional capacity for seismic loading. The pile weight is not included in these capacities and should be added.

Table 4 – Summary of Existing Pile Capacity Evaluation

Pile Type	Pile Cap Soffit Elevation (m, MSL)	As-Built Pile Tip Elevation (m, MSL)	As-Built Design Service Load (kN)	Pile Ultimate Capacity (kN)	Pile Ultimate Uplift Capacity (kN)
380-mm square	0.0	-10.0	507	480	79
Pile weight not included in ultimate capacities.					

Lateral load capacity for the existing 380-mm square concrete piles was evaluated assuming both fixed-head and free-head conditions, 6 mm of allowable deflection, and a factor of safety of 1.5 on the subgrade modulus. A summary of our evaluation of lateral capacity is presented in Table 5.

Table 5 – Existing Single Pile Lateral Load Capacity

Pile Design Parameters	Fixed Head Condition	Free-Head Condition
Length, m	10.0	10.0
Allowable Lateral Load, kN	16.3	4.4
Maximum Positive Moment, kN-m	32.5	21.5
Maximum Negative Moment, kN-m	51.1	0.98
Depth to Maximum Positive Moment, m	5.5	5.2
Depth to Maximum Negative Moment, m	0	8.1
Depth to Zero Deflection, m	6.5	6.1
Factor of safety on subgrade modulus = 1.5, 6-mm top deflection		

For lateral loading, piles in a pile group may be considered to act individually when the center-to-center spacing is greater than 2.5B (where B is the least dimension of the pile) in the direction normal to loading and greater than 8B in the direction parallel to loading. Table 6 presents the lateral load reduction factors to be applied for various pile spacings for in-line loading.

Table 6 – Lateral Load Reduction Factors

Center-to-Center Pile Spacing for In-Line Loading	Ratio of Lateral Resistance of Pile in Group to Single Pile
6B	1.0
5B	0.9
4B	0.8
3B	0.7

8.3.2. Bridge Foundation

We understand that the new bridge will be a multi-span concrete structure supported on CIDH piles. The service load for the bridge foundation is currently not available. Once this information becomes available, the capacities of the foundation piles can be further evaluated. Based on our understanding of the project, the piles will likely to be 1.5 to 2 m in diameter.

8.4. Abutments

Cantilever seat-type abutments may be designed in accordance with the pressure diagrams shown on Figure 3. This diagram includes both static and dynamic loading conditions. The dynamic force increment was evaluated based on a Mononobe-Okabe seismic coefficient analysis (Seed and Whitman, 1970). For structural analyses, an effective soil stress of 369 kPa may be used at the abutments.

This diagram is based on backfill meeting the specifications for structure backfill presented in Section 19 of the Standard Specifications, and on free-draining conditions. Measures should be taken to reduce moisture build-up behind abutment walls. Abutment walls should include free-draining backfill materials and perforated drains as designed by the project civil engineer, and should be constructed in accordance with Bridge Detail 3-5 on Plan B0-3 of the Standard Plans (Caltrans, 1995b).

8.5. Corrosion Analysis

The corrosion potential of the on-site materials at the project site was evaluated for its effect on steel and concrete structural members. The corrosion potential was evaluated using the results of laboratory tests on samples obtained during the subsurface evaluation.

Laboratory testing was performed on representative soil samples to evaluate pH, electrical resistivity, and chloride and soluble sulfate content. The pH and electrical resistivity tests were performed in accordance with CT 643, and sulfate and chloride tests were performed in accordance with CT 417 and 422, respectively.

Test results indicate that the pH of the soils ranged from 6.8 to 7.8. Electrical resistivity, which ranged from 300 to 7 500 ohm-cm, indicates that the on-site soils may be considered severely corrosive to ferrous metals. Testing indicates that soluble sulfate contents ranged from 0.003 to 0.124 percent, which indicates a potential for moderate corrosion to cement. Tested chloride contents ranged from 20 to 1 000 ppm, which indicates a potential for severely corrosive conditions for ferrous metals. In accordance with Memo 3.1 of the Bridge Memo To Designers (Caltrans, 1995e), a corrosive area is an area where the soil contains more than 500 ppm of chlorides, more than 0.20 percent sulfates or has an electrical resistivity of less than 1 000 ohm-cm. Therefore, based on chlorides and minimum resistivity, the project site may be considered to be corrosive.

We recommend that 75 mm or thicker concrete cover be maintained over reinforcing steel of footings and 50 mm or thicker cover for precast elements for surfaces in contact with native soils. We further recommend that Type II modified cement be used with a water-cement ratio of 0.50 or less and concrete strength of 27.5 MPa or more for structures which will be in contact with soils at the site.

9. CONSTRUCTION CONSIDERATIONS

The following section describes the anticipated geotechnical considerations for construction of the bridge.

9.1. CIDH Piles

The CIDH excavations should be observed by the geotechnical consultant during excavation to evaluate if the piles have been extended to the recommended depth or deeper. The site is underlain by a relatively shallow groundwater table and the existing alluvial soils contain zones of loose material. Caving of the pile excavations is anticipated. We recommend that steel casing be used to allow the excavations to remain open. A tremie should be used to place concrete.

The excavations should be cleaned of loose soil and cobbles. It is the Contractor's responsibility to take the necessary provisions to provide for the integrity of the excavation and to assure that the excavations are cleaned and straight and that all sloughed loose soil is removed from the bottom of the excavation prior to the placement of concrete. Drilled CIDH piles should be checked for alignment and plumbness during installation. The amount of acceptable misalignment of a pile is approximately 75 mm from the plan location. It is usually acceptable for a pile to be out of plumb one percent of the depth of the pile. The minimum center-to-center spacing of pile should be no less than 2-1/2 times the nominal diameter of the pile.

To evaluate the material properties of the CIDH pile after installation, it is recommended that access tubes be included as part of the reinforcing cage prior to the placement of concrete. The access tubes should consist of 50 mm or larger internal diameter, plastic (Schedule 40 PVC) pipes placed longitudinally in the drilled shaft by attachment to the reinforcing cage. It is recommended to install a pipe for every 1 m of CIDH pile outside perimeter. Accordingly, for a 2 m diameter CIDH pile, we recommend installing six access tubes spaced uniformly around the reinforcement cage, fastened to the inside of the cage. The lower ends of the access tubes should be plugged to keep out concrete. The tubes should be filled with water to stabilize the temperature of the tube to keep it from debonding from the concrete. Acoustic tests, if deemed necessary, should be performed within a few days of casting the pile.

9.2. Excavation

The results of our field exploration indicate that the project site is underlain by loose alluvial soils. In addition, a shallow groundwater table is present. The soils should generally be excavatable by heavy earth-moving equipment.

Based our understanding of the proposed construction, the bridge pile cap soffit elevation will be approximately -4.57 m MSL. Due to the presence of shallow groundwater, such excavations will necessitate dewatering prior to excavation and during construction (see the following section).

Since shallow groundwater was encountered at the site, we anticipate that construction will be accomplished by installing a groundwater barrier and dewatering the excavation area. This may consist of a retaining system constructed of interlocking sheet piles driven around the perimeter of the excavation to create a cofferdam-type structure. The interlocking sheet pile system should be internally braced through the use of an appropriately designed system of walers and struts to provide adequate internal rigidity. These sheet piles may be driven by either vibratory methods or by conventional pile driving techniques. Prior to installation of the sheet pile, the riprap blanket should be removed from the vicinity. In order to avoid piping at the bottom of the excavation, sheet piles should be driven to a depth of 3 m below the bottom of the excavation.

California OSHA requirements pertaining to worker safety should be met. Site soils should be considered to be "Type C" in accordance with the California Title 8 Construction Safety Orders, due to the sandy and saturated materials. We further recommend that the construction method provided herein be carefully evaluated by a qualified specialty contractor prior to commencement of the construction.

9.3. Dewatering

As indicated previously, because of the presence of shallow groundwater at the site, we anticipate that dewatering will be performed within a cofferdam prior to excavation. The dewatering scheme likely will include pumping of the groundwater from wellpoints installed within the cofferdam. The wellpoint system design should be evaluated by the specialty dewatering contractor. If requested, we can consult with the dewatering contractor, and provide a groundwater model to assist in developing an appropriate dewatering scheme. Possible settlement of adjacent and nearby structures as a result of dewatering is possible and should be considered.

Dewatering of the groundwater within the excavation defined by the sheet piles will affect the water level outside of the excavation. This will result in an increase of effective stresses and may induce settlement of soils underlying adjacent areas. Vibrations from driving of sheet piles or other piles can also induce settlement. Therefore, some distress to nearby structures, including concrete curbs and asphalt concrete streets is possible. We recommend that the existing condition of these facilities be documented with photography and/or video recordings prior to, and monitored during, construction.

Discharge of water from excavations may constitute securing a National Pollution Discharge Elimination System (NPDES) permit. Compliance with the permit requirements may involve testing and treatment of the water prior to discharge to storm drains.

10. CONSTRUCTION OBSERVATION

The recommendations in this report are based on preliminary structural design information for the proposed construction and subsurface information disclosed by our geotechnical evaluation and review of previous site evaluation reports. The assumed subsurface conditions should be checked in the field by the Caltrans geotechnical engineer during construction. If actual conditions differ considerably from the information provided in this report, the geotechnical consultant should be contacted.

11. LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

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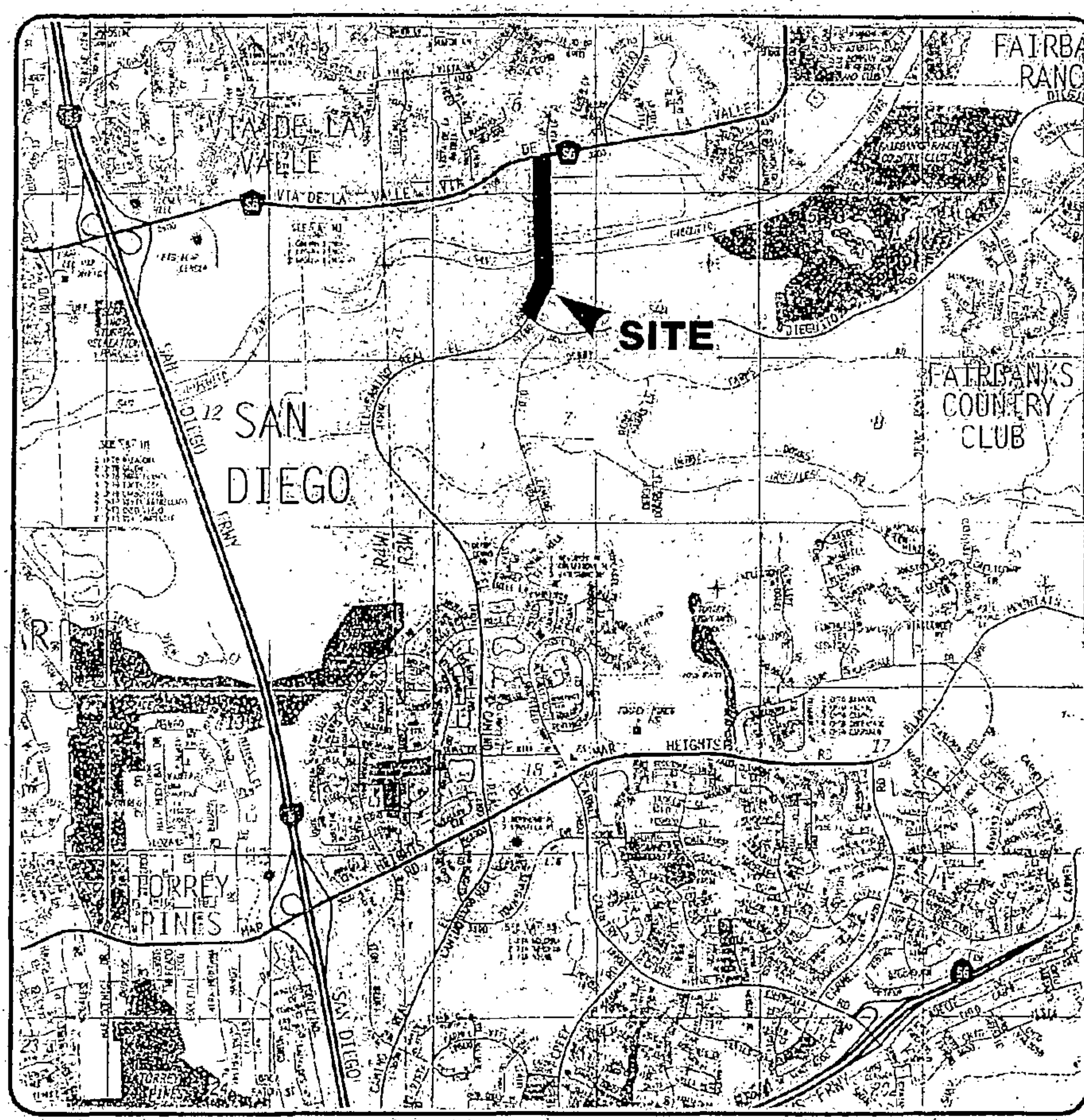
AERIAL PHOTOGRAPHS				
Source	**Date**	**Flight No.**	**Photo No.**	**Scale**
USDA	4/11/53	AXN-8M	10 and 11	1:20 000



REFERENCE: 1997 Thomas Guide for San Diego County, Street Guide and Directory

0 2400 4800
Approximate Scale in Feet

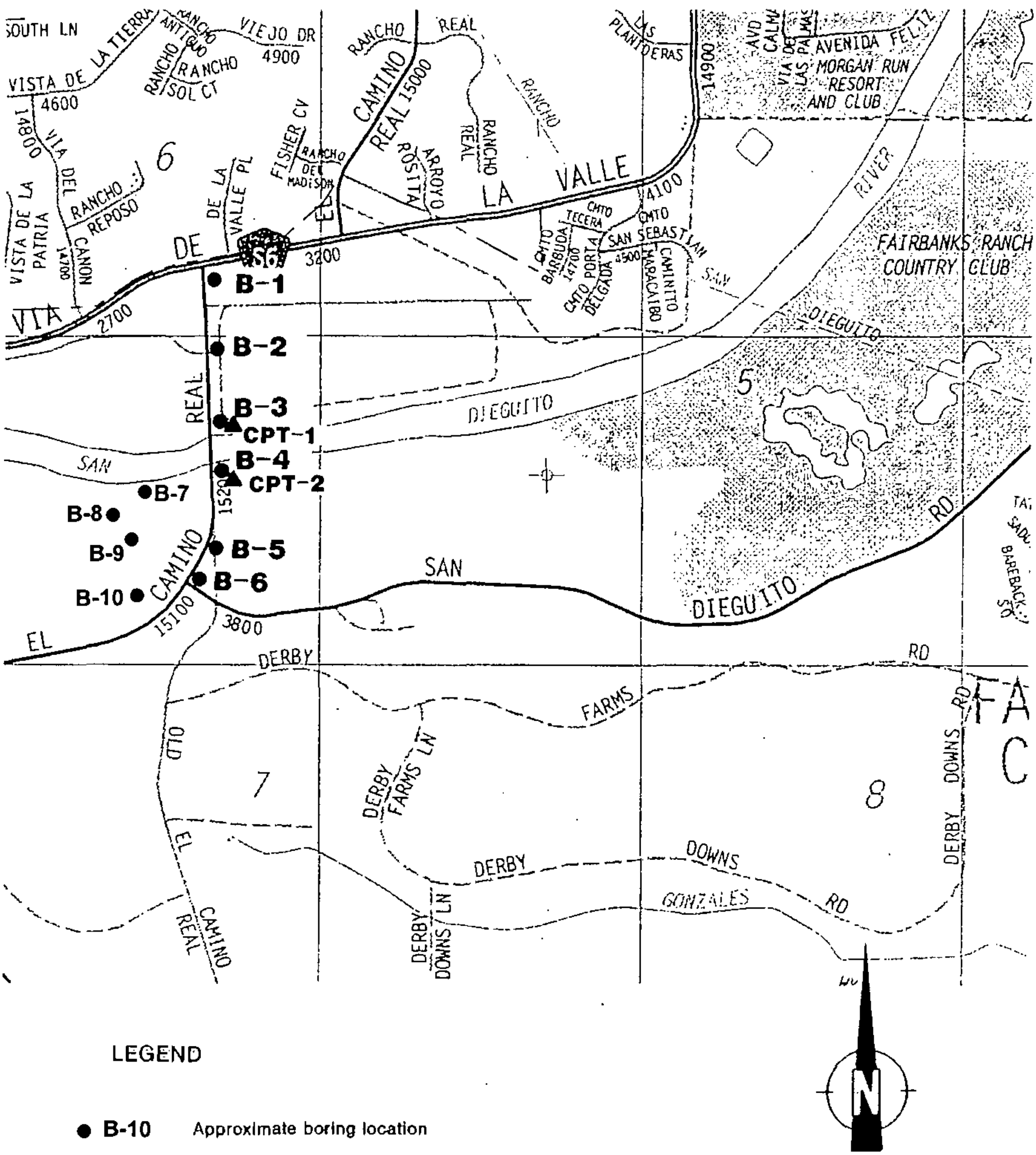
NORTH

Ninyo & Moore

SITE LOCATION MAP

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645001	6/05	1



LEGEND

● **B-10** Approximate boring location

▲ **CPT-2** Approximate CPT sounding location

NO SCALE

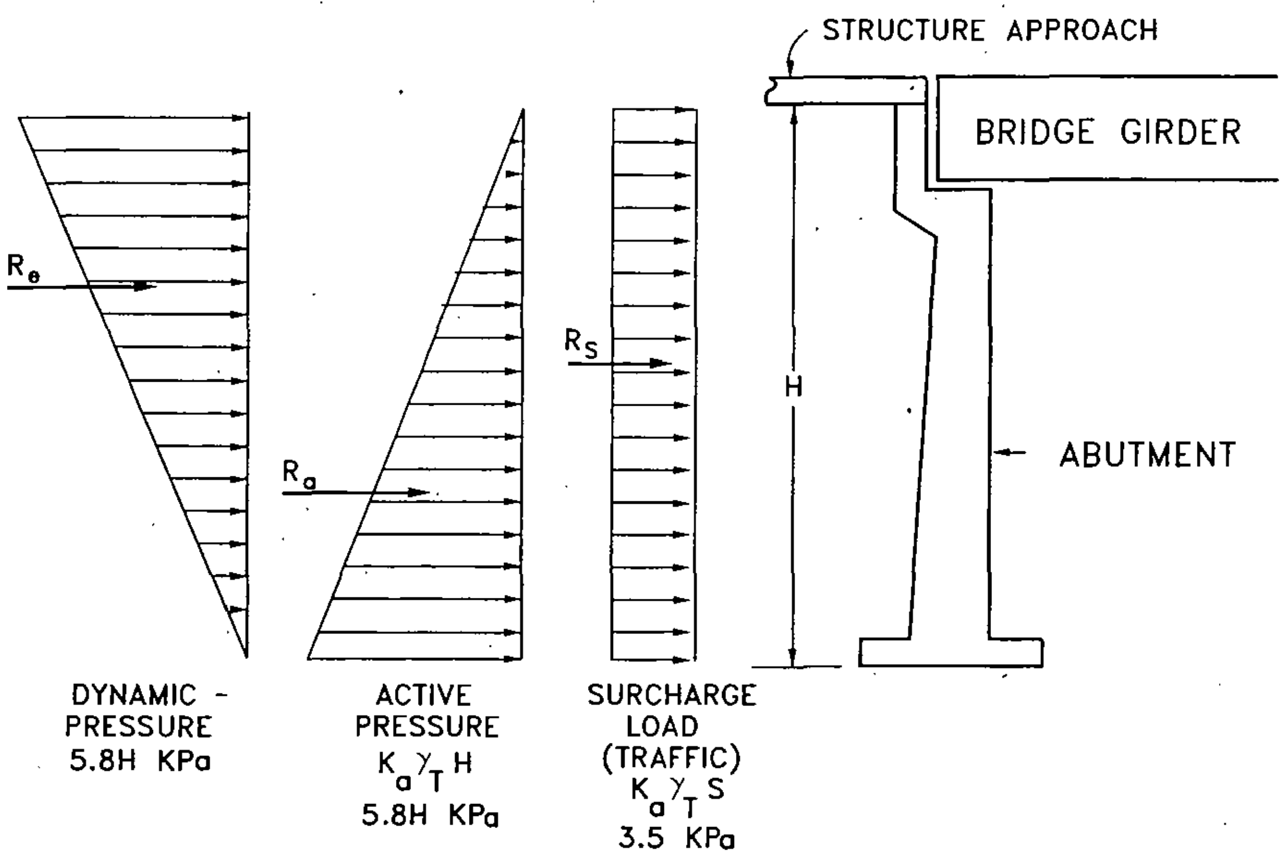
Ninyo & Moore

SITE PLAN AND BORING/CPT LOCATION MAP

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE
103645001	6/05

FIGURE
2



$$R_e = 2.9H^2 \text{ KN/m}$$
$$R_a = 2.9H^2 \text{ KN/m}$$
$$R_S = 3.5H \text{ KN/m}$$

ASSUMED CONDITIONS

1. $K_a = 0.31$
2. No hydrostatic pressure buildup behind the abutment wall
3. H=Abutment height in mm
4. S=Surcharge 600mm
5. $\gamma_T = 18.9 \text{ KN/m}^3$
6. Earthquake-induced earth pressure is based on a horizontal ground acceleration of 0.5g
7. The resultant force (R_e) of earthquake-induced earth pressure acts at $2/3$H above the toe of abutment
8. The resultant force (R_a) of the active-induced earth pressure acts at $1/3$H above the toe of abutment

g:\CADD\103645\3645F3

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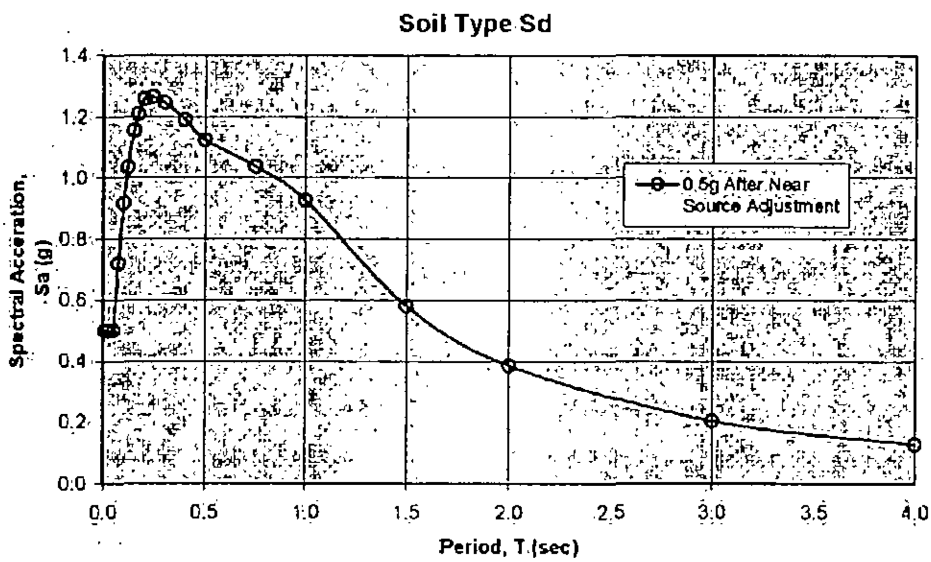
CANTILEVER SEAT ABUTMENT PRESSURE DIAGRAM

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645001	6/05	3

Computed ARS Curve (Soil Type Sd)		
Period (sec)	0.5 g	0.5 g After Near Source Adjustment
0.01	0.500	0.500
0.02	0.500	0.500
0.03	0.500	0.500
0.05	0.500	0.500
0.075	0.719	0.719
0.10	0.919	0.919
0.12	1.037	1.037
0.15	1.156	1.156
0.17	1.209	1.209
0.20	1.259	1.259
0.24	1.266	1.266
0.30	1.247	1.247
0.40	1.190	1.190
0.50	1.125	1.125
0.75	0.944	1.038
1.0	0.772	0.927
1.5	0.484	0.581
2.0	0.321	0.386
3.0	0.170	0.204
4.0	0.106	0.128



103645001 ars cure fig 4

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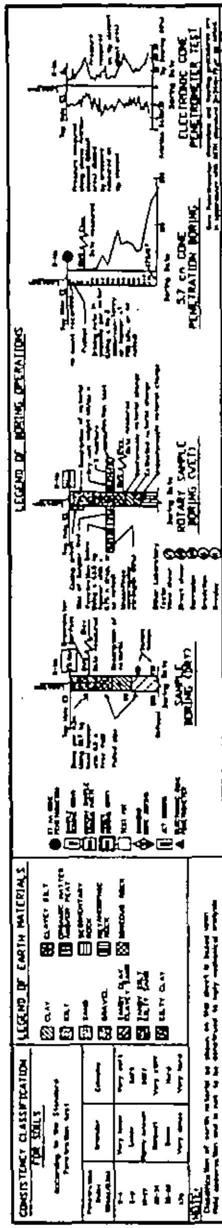
ARS CURVE

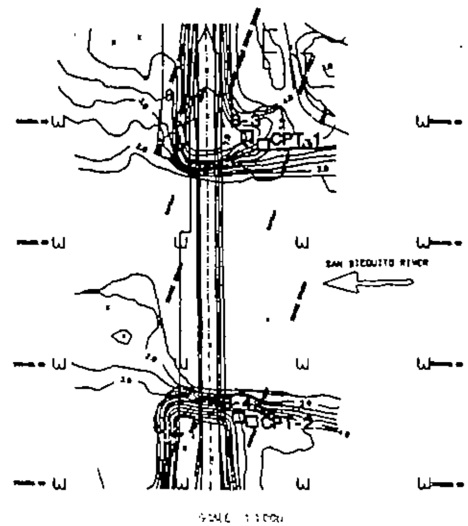
EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

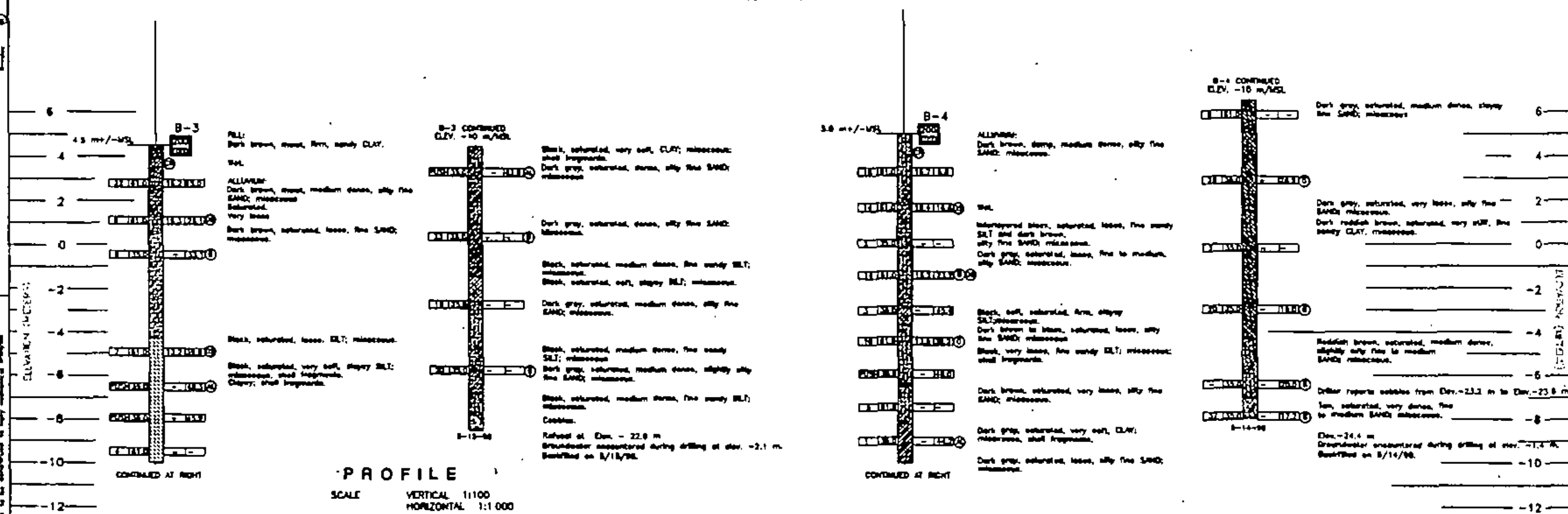
PROJECT NO.	DATE
103645001	6/05

FIGURE
4

SPT (blows/0.3m)	CONSISTENCY OF COHESIONLESS SOILS	CONSISTENCY OF COHESIVE SOILS	SPT (blows/0.3m)
0–4	Very Loose	Very Soft	<2
5–10	Loose	Soft	2–4
11–30	Medium Dense	Firm	5–8
31–50	Dense	Stiff	9–15
>50	Very Dense	Very Stiff	16–30
		Hard	>30







PROFILE

SCALE VERTICAL 1:100
HORIZONTAL 1:1 000

DIST	COUNTY	ROUTE	POST KM TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	SD				

REGISTERED CIVIL ENGINEER
SENIOR GEOTECHNICAL ENGINEER

PLANS APPROVAL DATE

NINYO & MOORE
10225 BARNES CANYON RD, STE A-112
SAN DIEGO, CA 92121

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this sheet.

Metric

DRAWN BY ELZBIETA KARCZEWSKI
CHECKED BY MICHAEL R. RAHILLY

EDGAR CAMERINO
PROJECT ENGINEER

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. - -
POST KM

EL CAMINO REAL WIDENING
LOG OF TEST BORINGS

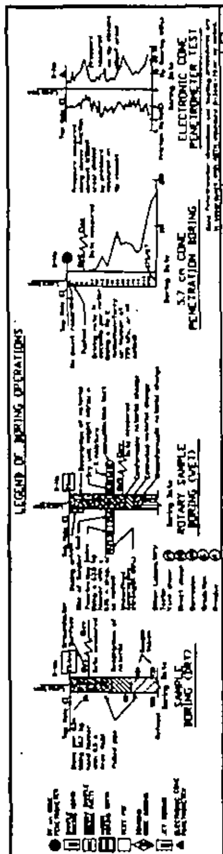
ORIGINAL SCALE IS IN MILLIMETERS FOR REDUCED PLANS

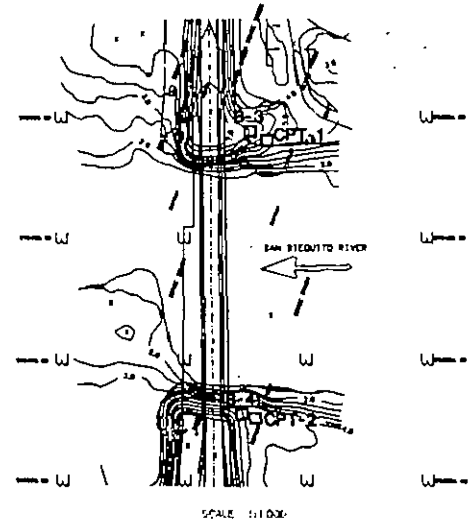
REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 1 OF 1

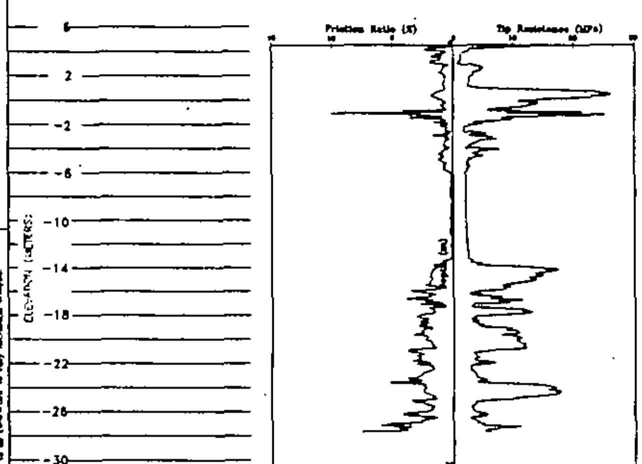
\103845\3845br1

SPT (blows/0.3m)	CONSISTENCY OF COHESIONLESS SOILS	CONSISTENCY OF COHESIVE SOILS	SPT (blows/0.3m)
0-4	Very Loose	Very Soft	<2
5-10	Loose	Soft	2-4
11-30	Medium Dense	Firm	5-8
31-50	Dense	Stiff	9-15
>50	Very Dense	Very Stiff	16-30
		Hard	>30

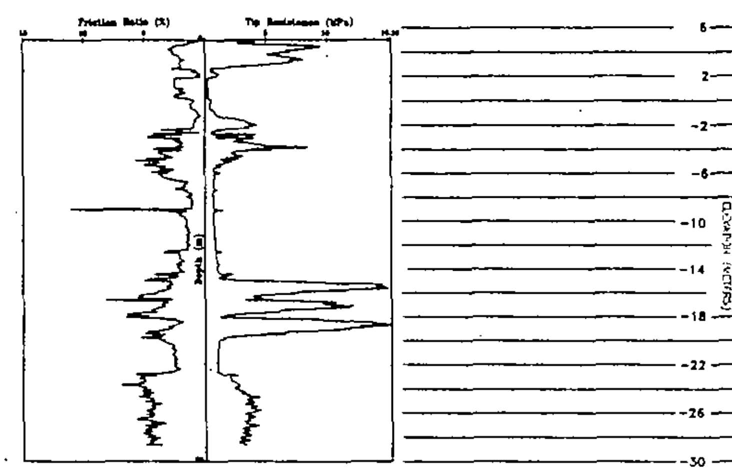




CPT-1



CPT-2



PROFILE
VERTICAL 1:200
HORIZONTAL 1:1000

DIST	COUNTY	ROUTE	POST KM TOTAL PROJECT	SHEET NO	TOTAL SHEETS
11	SD				

REGISTERED CIVIL ENGINEER
SENIOR GEOTECHNICAL ENGINEER

PLANS APPROVAL DATE

NINYO & MOORE
10225 BARNES CANYON RD STE A-112
SAN DIEGO, CA 92121

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DRAWN BY ELZBIETA KARCZEWSKI
CHECKED BY MICHAEL R. RAHILLY

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

EDGAR CAMERINO
PROJECT ENGINEER

BRIDGE NO.
POST KM

EL CAMINO REAL WIDENING
LOG OF TEST BORINGS

ORIGINAL SCALE IS IN MILLIMETERS FOR REDUCED PLANS

REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 2 OF 2

\103645\3645br_cpt

APPENDIX A

Ninyo & Moore

APPENDIX A

LABORATORY TESTING

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488-93. Soil classifications are indicated on the Log of Test Borings Sheets.

In-Place Moisture and Density Tests

The moisture content and dry density of relatively undisturbed samples obtained from the exploratory excavations were evaluated in general accordance with ASTM D 2937-94. The test results are presented on the logs of the Log of Test Borings Sheets.

Gradation Analysis

Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422-63. The grain-size distribution curves are shown on Figures A-1 through A-8. These test results were utilized in evaluating the soil classifications in accordance with the Unified Soil Classification System.

Atterberg Limits

Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318-95. These test results were utilized to evaluate the soil classification in accordance with the Unified Soil Classification System. The test results and classifications are shown on Figure A-9.

Consolidation Tests

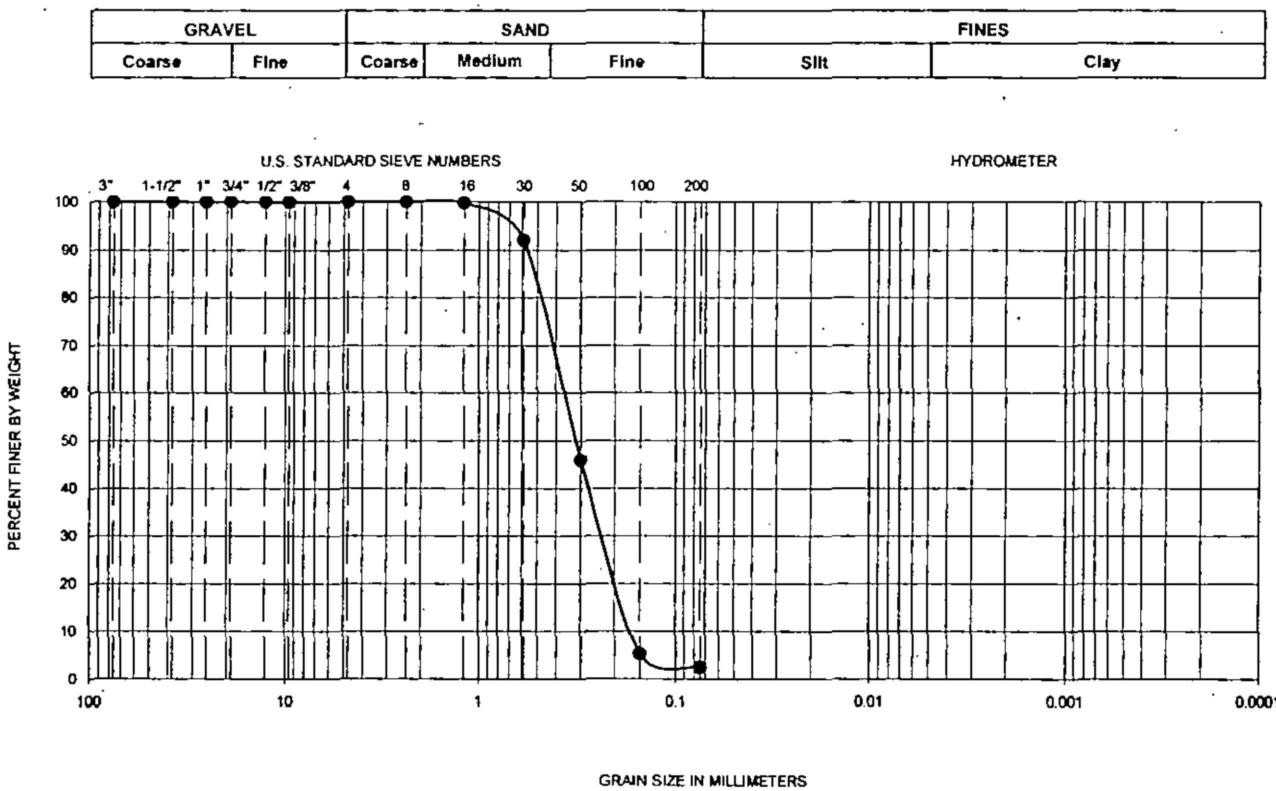
A consolidation test was performed on a selected relatively undisturbed soil sample in general accordance with ASTM D 4546-90. The sample was inundated during testing to represent adverse field conditions. The percent of consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the tests are summarized on Figure A-10.

Direct Shear Tests

Direct shear tests were performed on undisturbed samples in general accordance with ASTM D 3080-90 to evaluate the shear strength characteristics of selected materials. The samples were inundated during shearing to represent adverse field conditions. The test strain rate was 0.125 mm per minute. The results are shown on Figures A-11 through A-14.

Soil Corrosivity Tests

Soil pH, and minimum resistivity tests were performed on representative samples in general accordance with Caltrans Test (CT) 643. The chloride content of selected samples was evaluated in general accordance with CT 422. The sulfate content of selected samples was evaluated in general accordance with CT 417. The test results are presented on Figure A-15.



Symbol	Hole No.	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-3	4.6-5.0	--	--	--	0.17	0.24	0.38	2.2	0.9	2.4	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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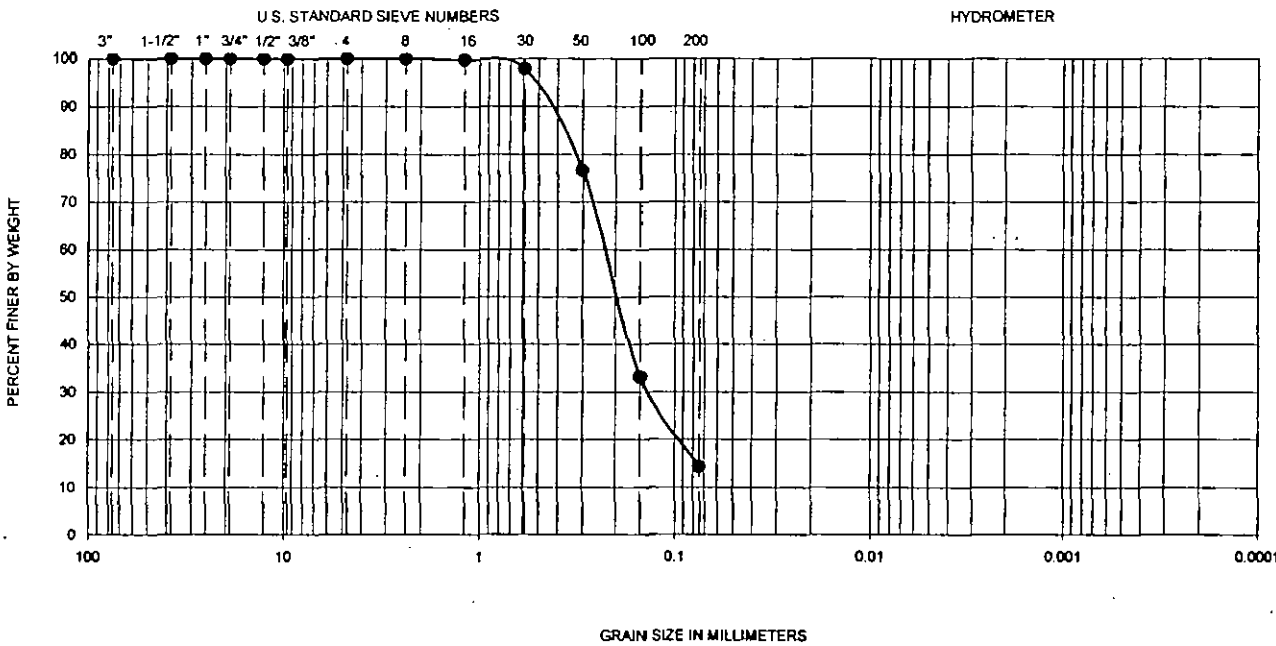
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-1

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-3	18.3-18.8	–	--	–	0.06	0.14	0.23	4.0	1.5	14.2	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

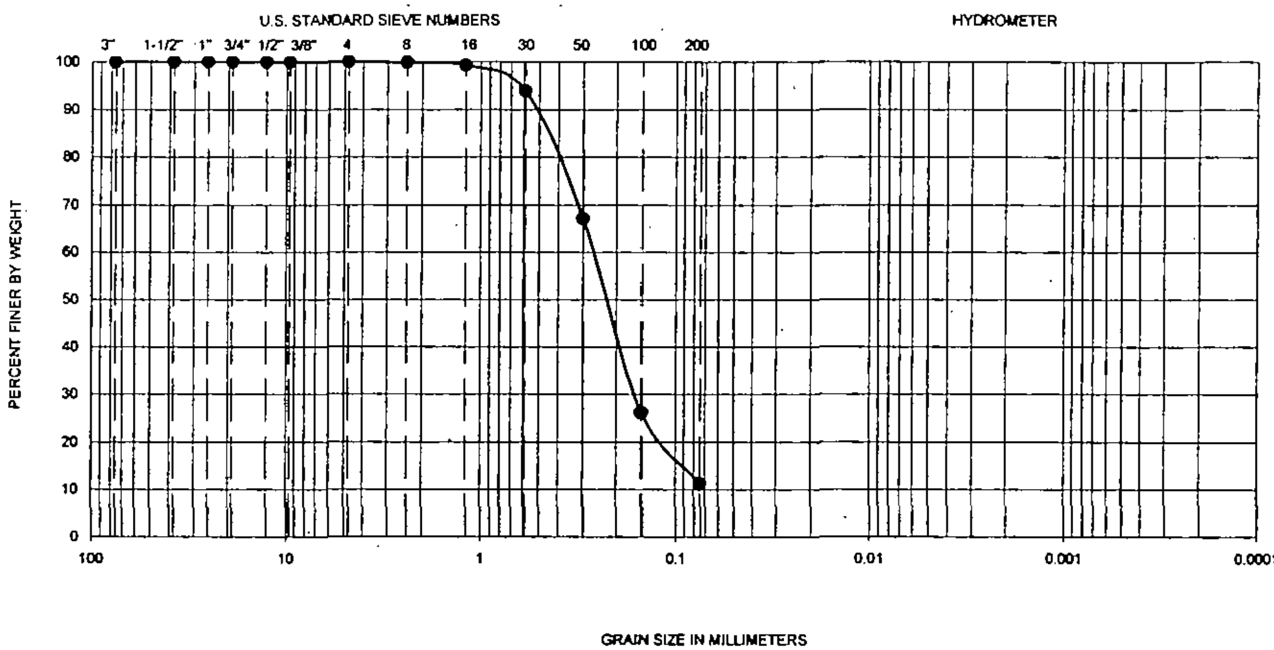
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-2

63645-2m xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-3	24.4-24.9	--	--	--	0.07	0.16	0.27	4.1	1.4	11.1	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

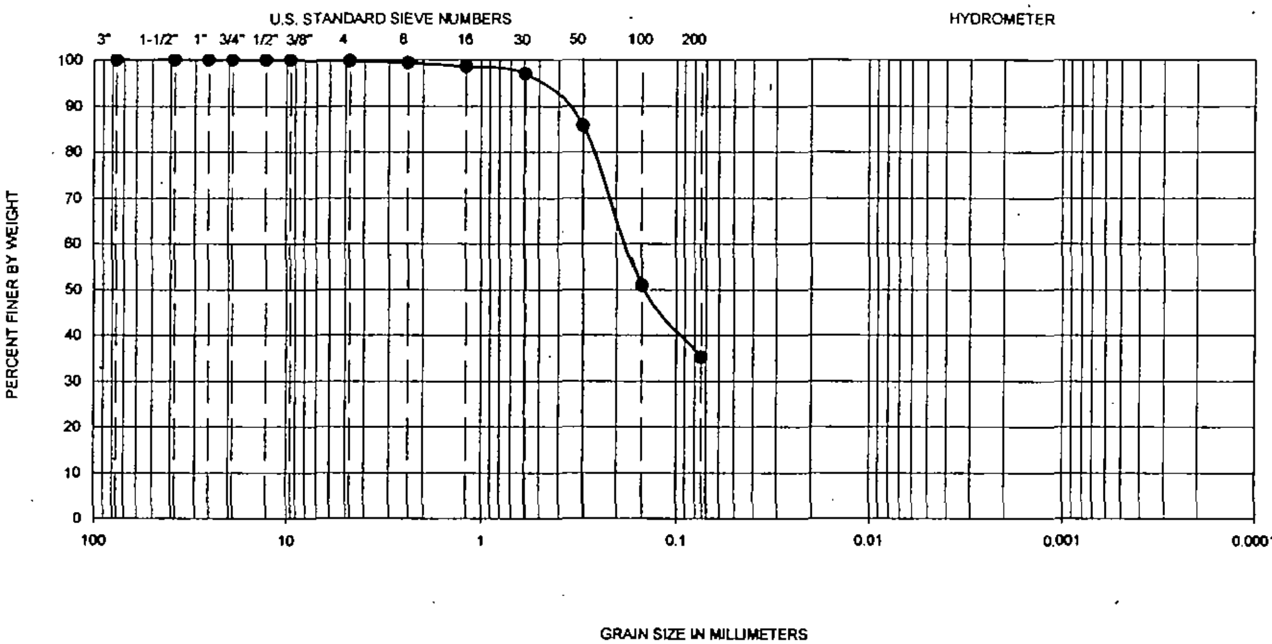
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-3

53645-3m.xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-4	6.1-6.6	--	--	--	--	--	--	--	--	35.2	SC

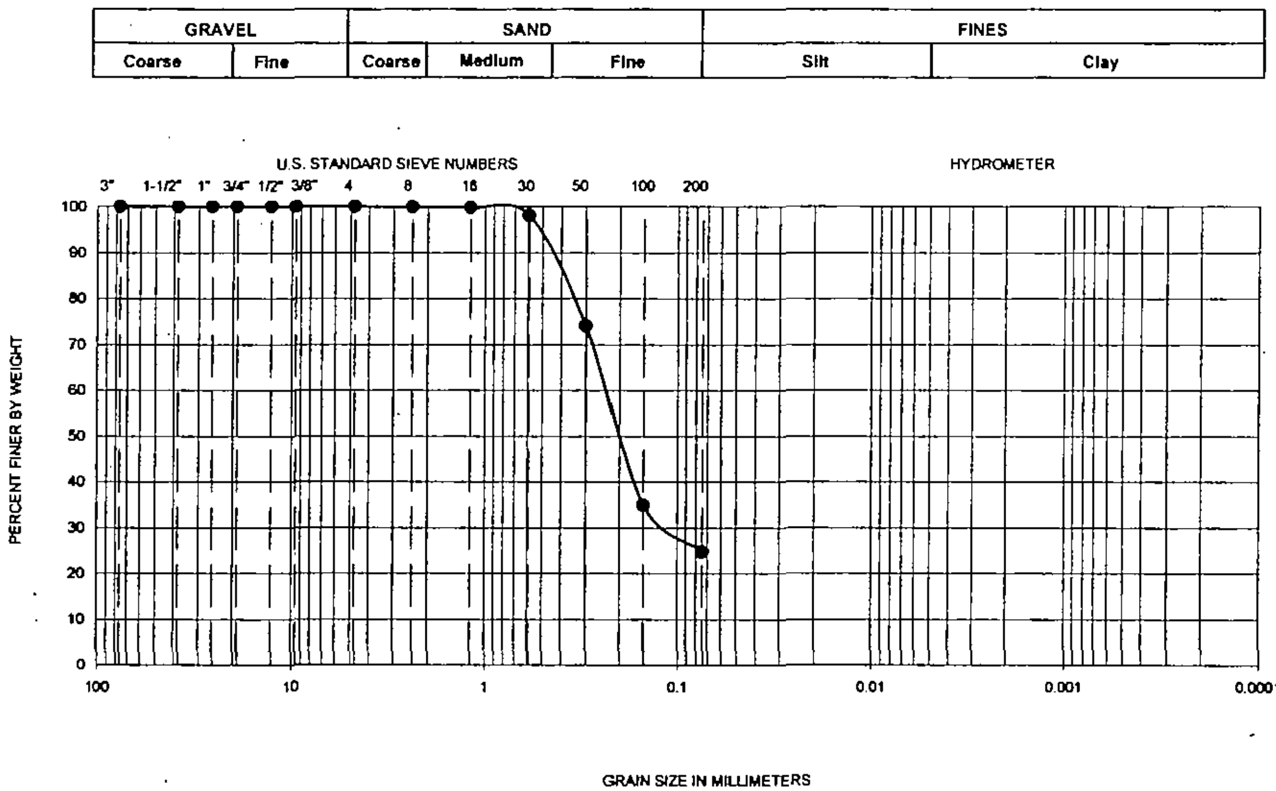
PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-4



Symbol	Hole No.	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-4	18.3-18.8	--	--	--	--	--	--	--	--	24.7	SC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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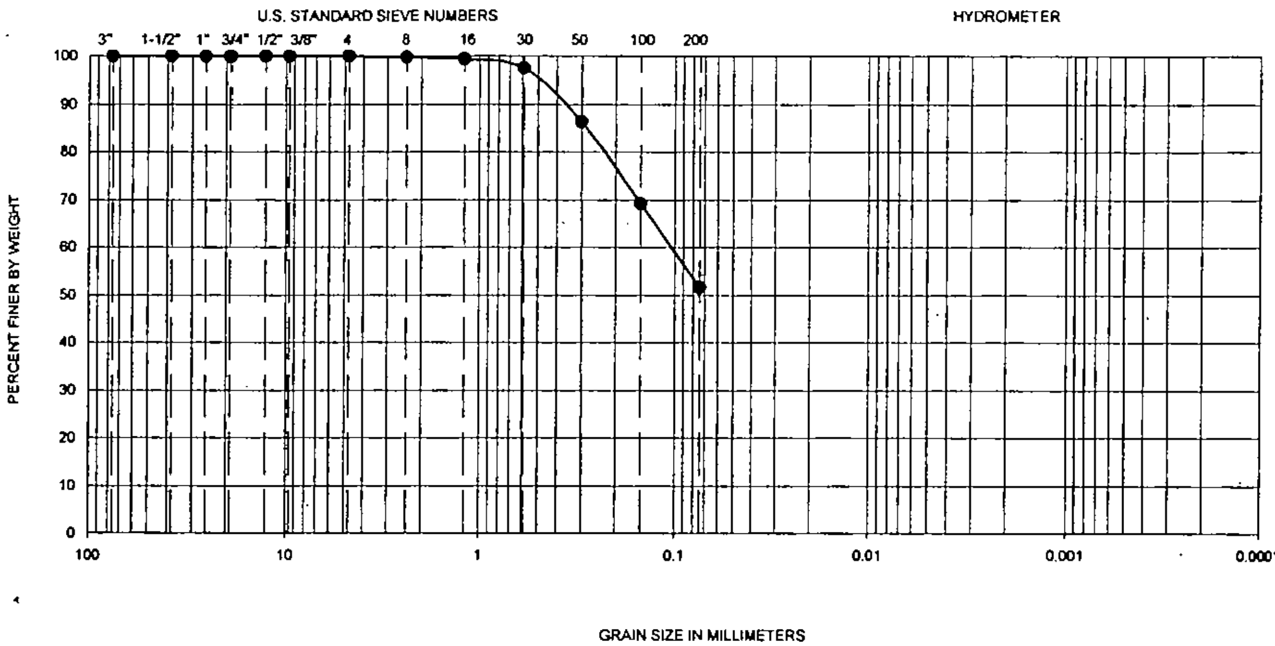
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-5

53645-5m.xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-4	24.4-24.9	--	--	--	--	--	--	--	--	51.6	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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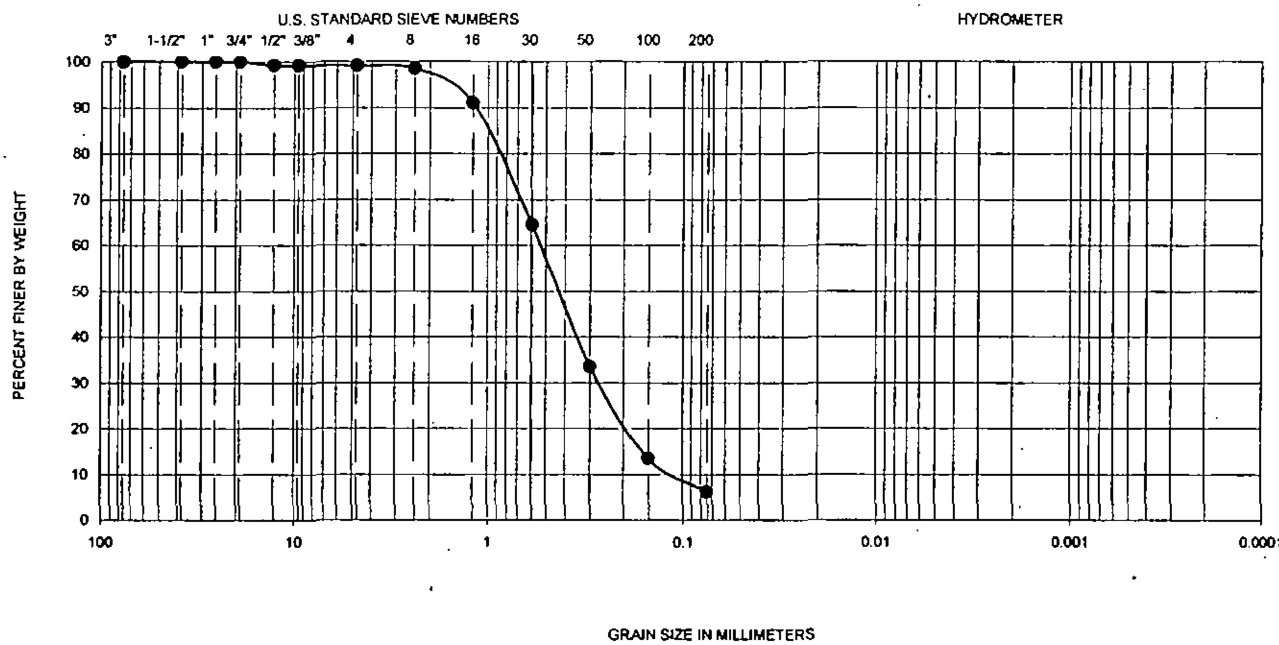
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-6

S3645-6m xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-4	27.4-27.9	--	--	--	0.12	0.28	0.54	4.5	1.2	6.1	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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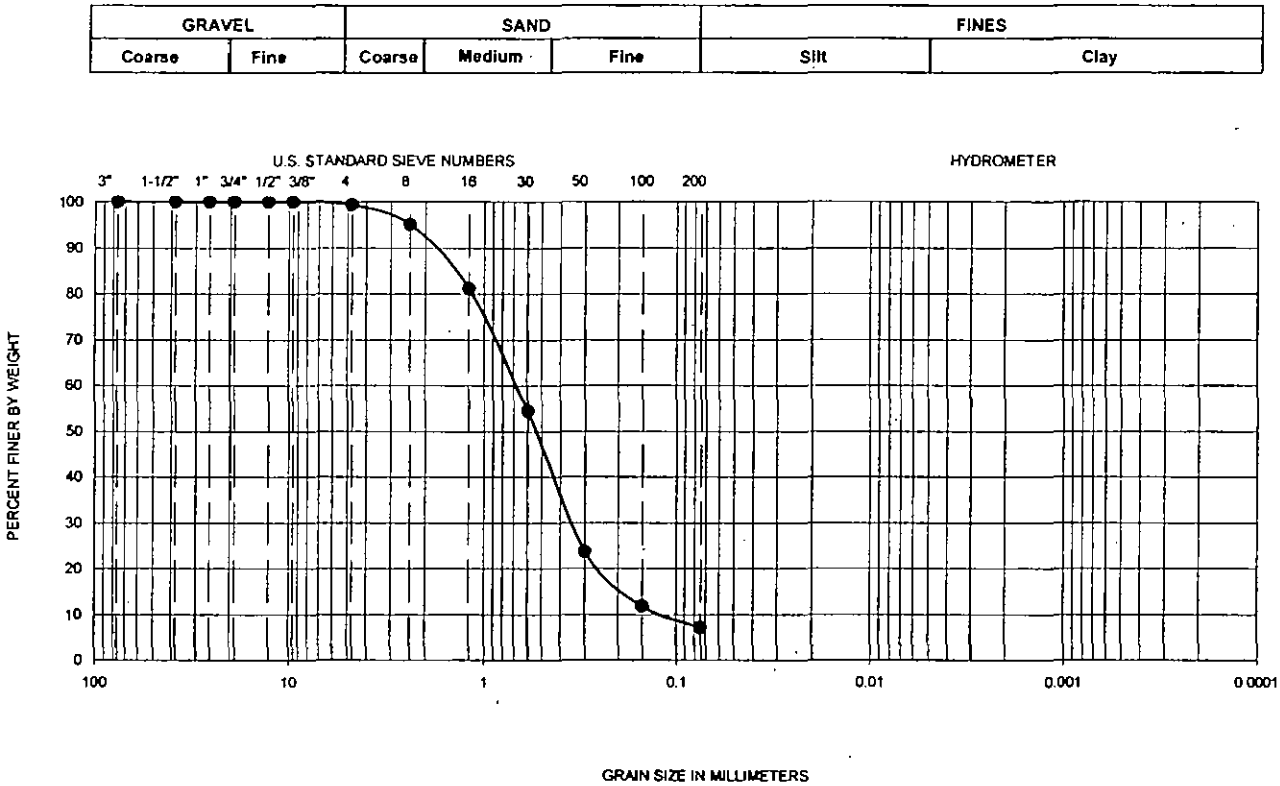
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-7

S3645-7m.xls



Symbol	Hole No.	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-4	29.0-29.5	--	--	--	0.12	0.28	0.68	5.7	1.0	7	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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GRADATION TEST RESULTS

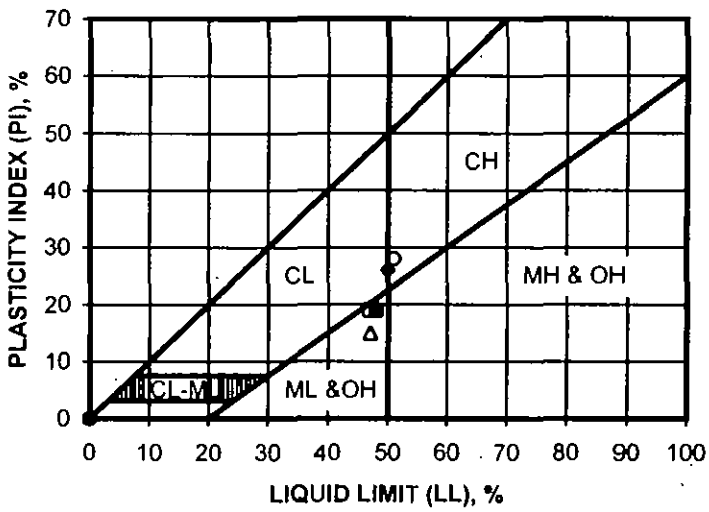
El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-8

S3645-8m.xls

SYMBOL	LOCATION	DEPTH (m)	LL (%)	PL (%)	PI (%)	U.S.C.S. CLASSIFICATION (Minus No. 40 Sieve Fraction)	U.S.C.S. (Entire Sample)
●	B-2	3.0-3.5	--	--	--	NP	SM
■	B-3	10.7-11.2	48	29	19	ML	ML
◆	B-3	15.2-15.7	50	24	26	CH	CH
○	B-4	13.7-14.2	51	23	28	CH	CH
□	B-5	4.6-5.1	47	28	19	ML	ML
Δ	B-6	3.0-3.5	47	32	15	ML	ML

NP - Indicates non-plastic
Borings B-2, B-5 and B-6 are included in El Camino Real Roadway Widening Report



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

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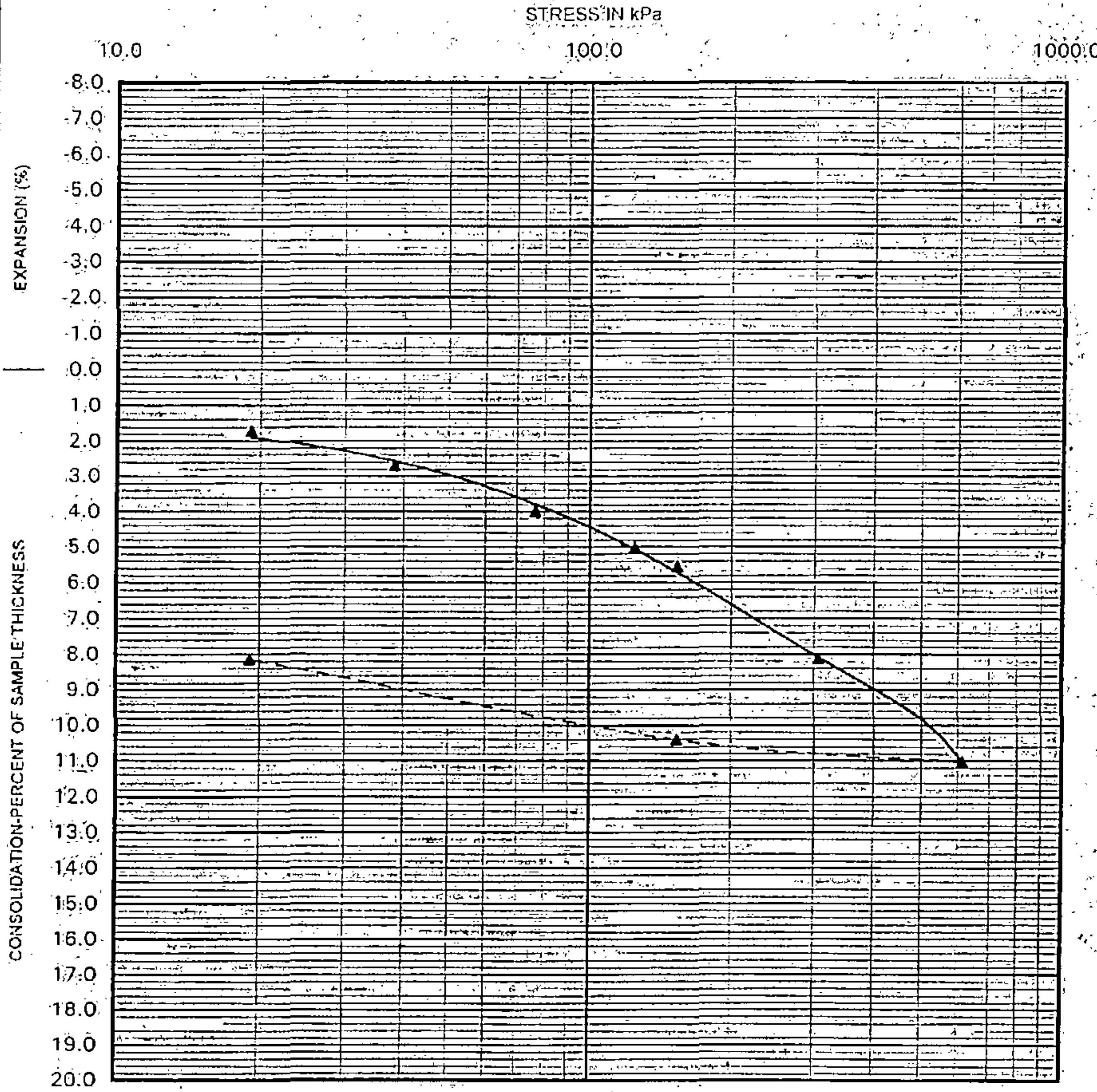
ATTERBERG LIMITS TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-9

AL3645m.xls



- - ◆ - - Seating Cycle
● Loading Prior to Inundation
▲ Loading After Inundation

Boring No. B-4
Depth (m) 9.1-9.6
Soil Type ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435-90

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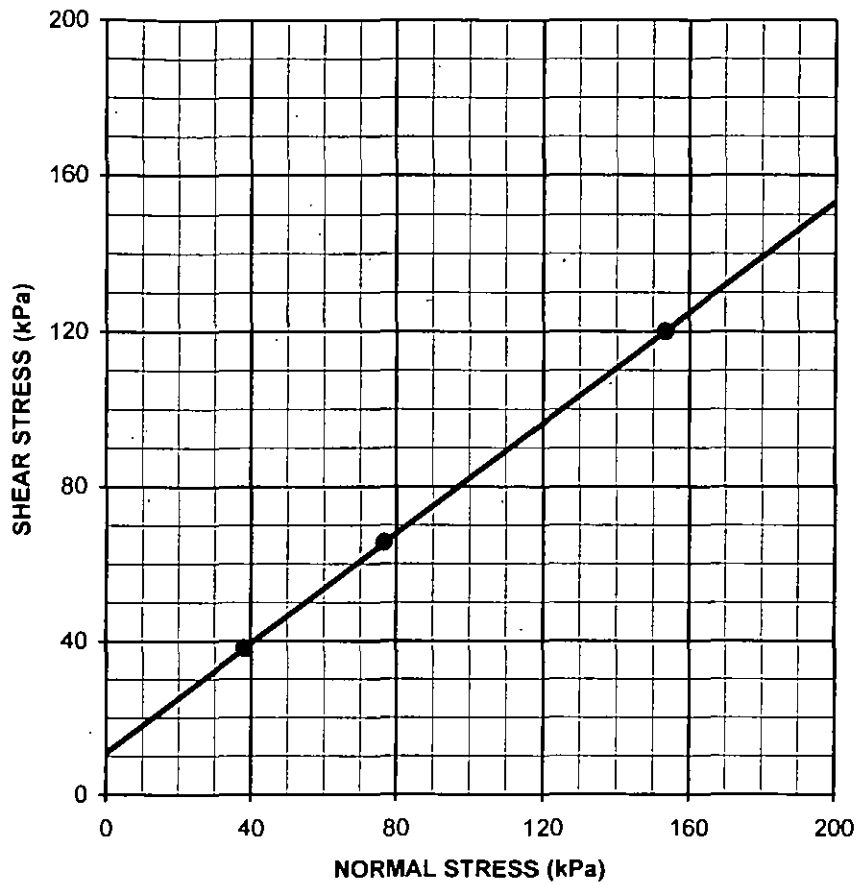
CONSOLIDATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE
103645001	6/05

FIGURE A-10

CON3645 hm



Description	Symbol	Boring Number	Depth (m)	Shear Strength	Cohesion (kPa)	Friction Angle (deg)	Soil Type
Silty Sand	●	B-3	3.0-3.5	Peak	11.5	35	SM

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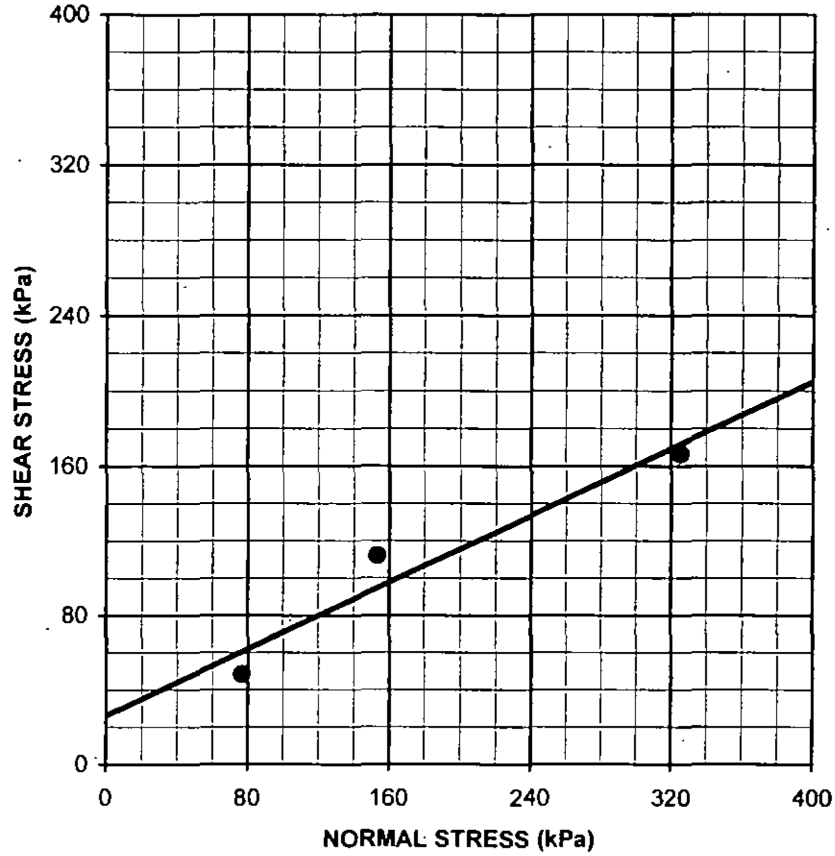
DIRECT SHEAR TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-11

DS3645-1m.xls



Description	Symbol	Boring Number	Depth (m)	Shear Strength	Cohesion (kPa)	Friction Angle (deg)	Soil Type
Sandy Silt	●	B-3	9.1-9.6	Peak	26.5	25	ML

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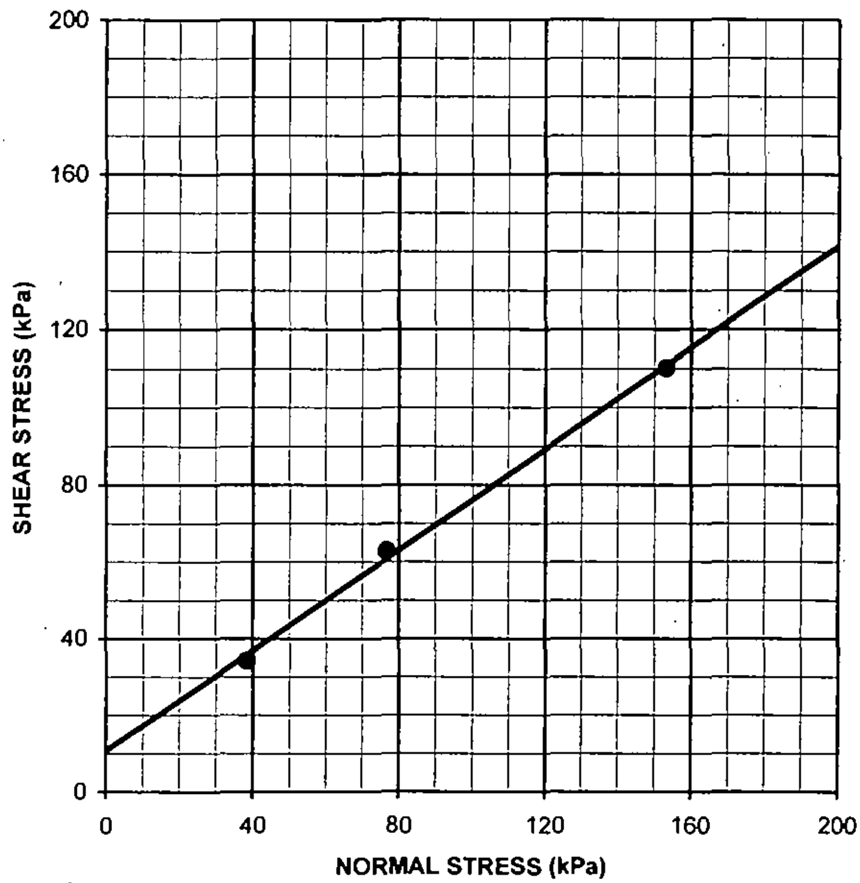
DIRECT SHEAR TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-12



Description	Symbol	Boring Number	Depth (m)	Shear Strength	Cohesion (kPa)	Friction Angle (deg)	Soil Type
Silty Sand	●	B-4	3.0-3.5	Peak	11	33	SM

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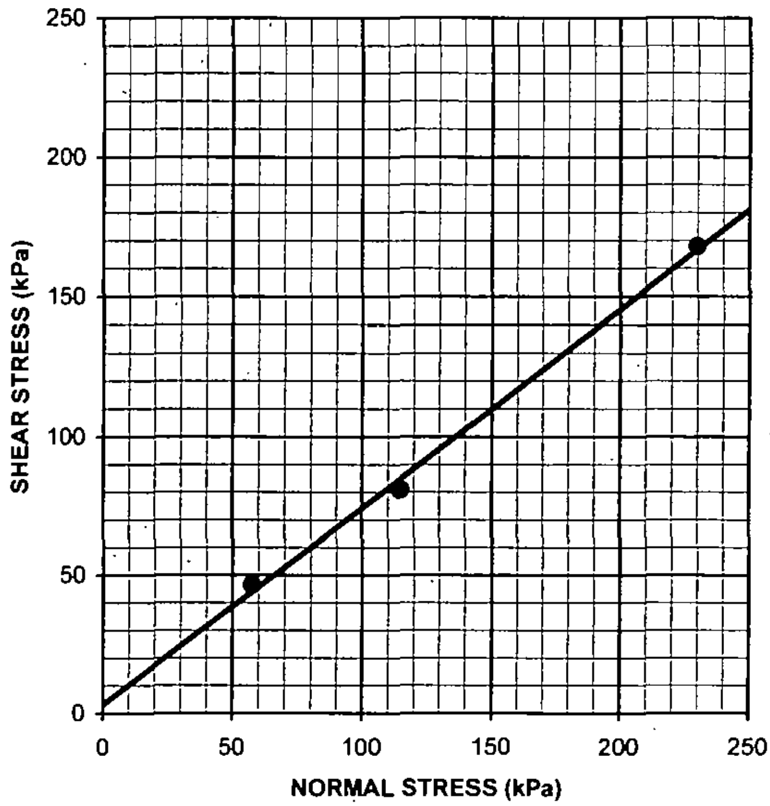
DIRECT SHEAR TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-13

DS3645-3m.xls



Description	Symbol	Boring Number	Depth (m)	Shear Strength	Cohesion (kPa)	Friction Angle (deg)	Soil Type
Silty Sand	●	B-4	6.1-6.6	Peak	3.8	35	SM

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DIRECT SHEAR TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645001	6/05	A-14

CORROSIVITY TEST RESULTS

SAMPLE LOCATION	SAMPLE DEPTH (m)	pH *	RESISTIVITY * (ohm-cm)	WATER-SOLUBLE SULFATE CONTENT IN SOIL ** (percent)	CHLORIDE CONTENT *** (ppm)
B-1	0.0 - 1.5	7.7	300	0.124	1,000
B-2	0.0 - 1.8	7.8	470	0.030	640
B-3	0.0 - 1.5	7.0	680	0.040	135
B-4	0.0 - 1.5	7.3	7,500	0.003	20
B-5	0.0 - 1.5	6.8	545	0.033	55
B-6	0.0 - 1.5	6.9	480	0.042	345

* PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643

** PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417

*** PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

Borings B-1, B-2, B-5 and B-6 are included in El Camino Real Roadway Widening Report

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CORROSIVITY TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE
103645001	6/05

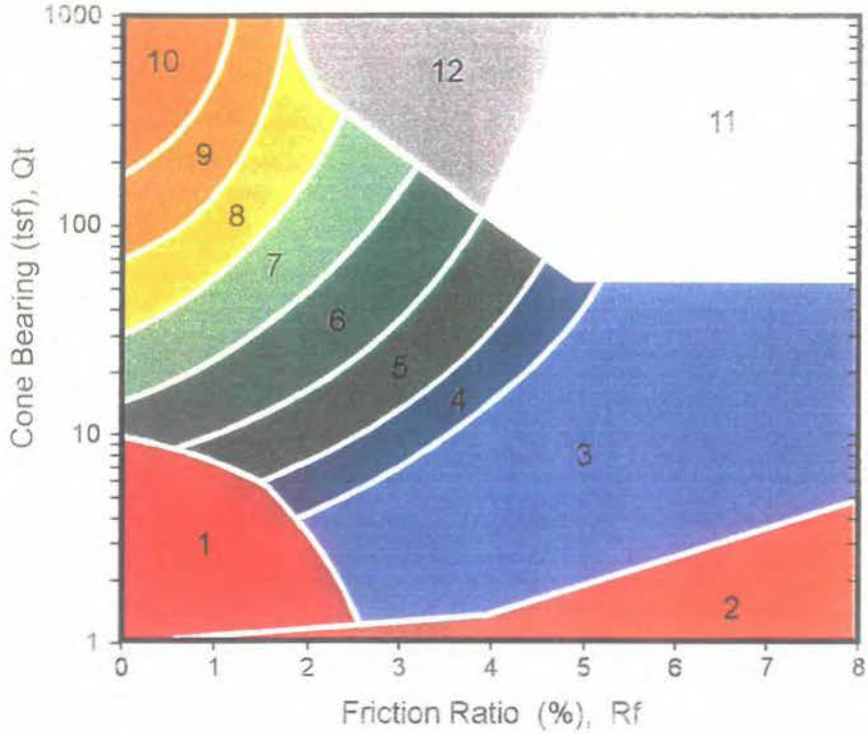
FIGURE A-15

APPENDIX B

APPENDIX B

CONE PENETROMETER TESTING

CPT Classification Chart
(after Robertson and Campanella 1988)



Zone	Q_t / N	Soil Behaviour Type
1	2	sensitive fine grained
2	1	organic material
3	1	clay
4	1.5	silty clay to clay
5	2	clayey silt to silty clay
6	2.5	sandy silt to clayey silt
7	3	silty sand to sandy silt
8	4	sand to silty sand
9	5	sand
10	6	gravelly sand to sand
11	1	very stiff fine grained *
12	2	sand to clayey sand *

* overconsolidated or cemented

GREGG

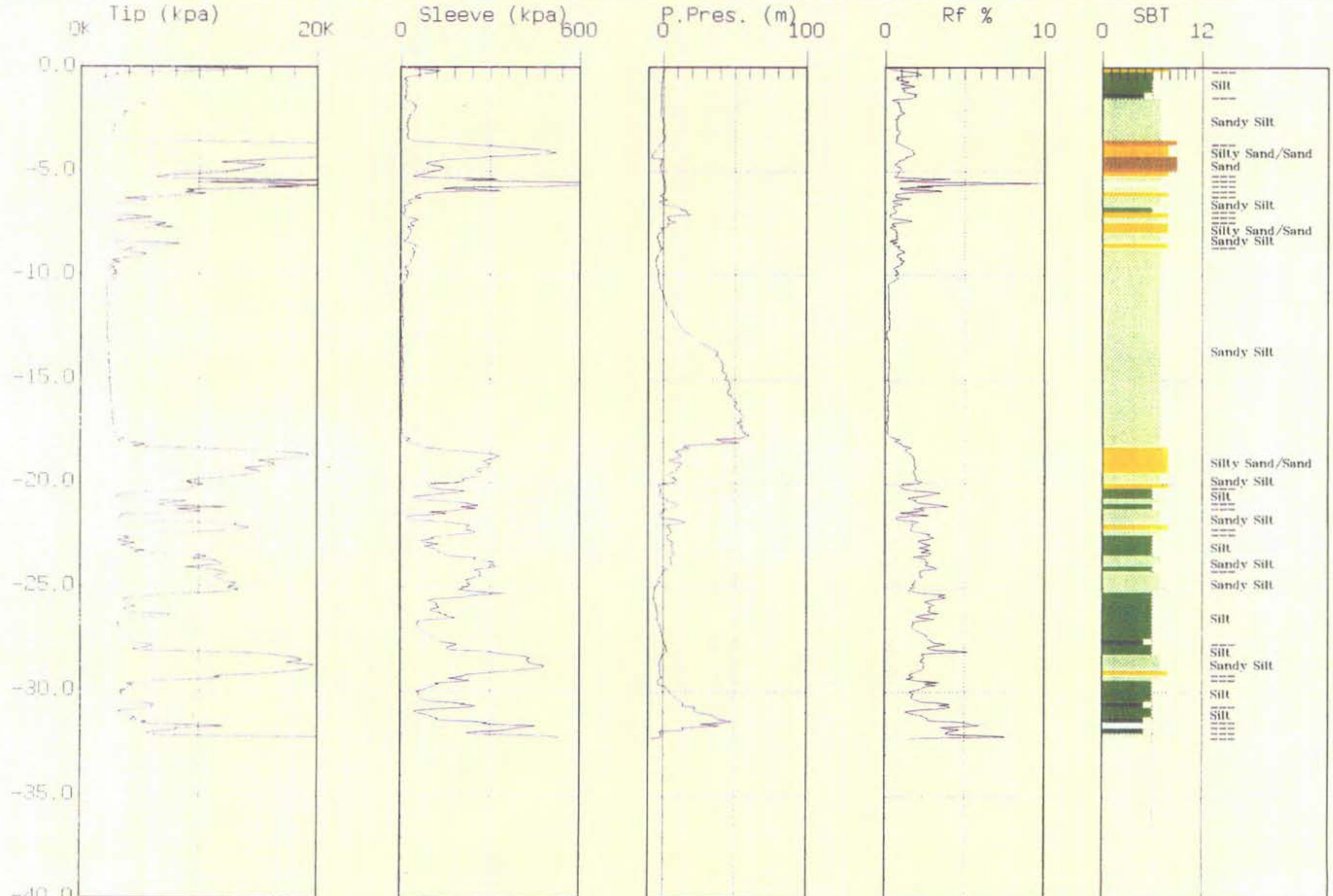
Gregg In Situ, Inc.

GREGG

NINYO & MOORE

Site: EL CAMINO REAL
Location: CPT-1

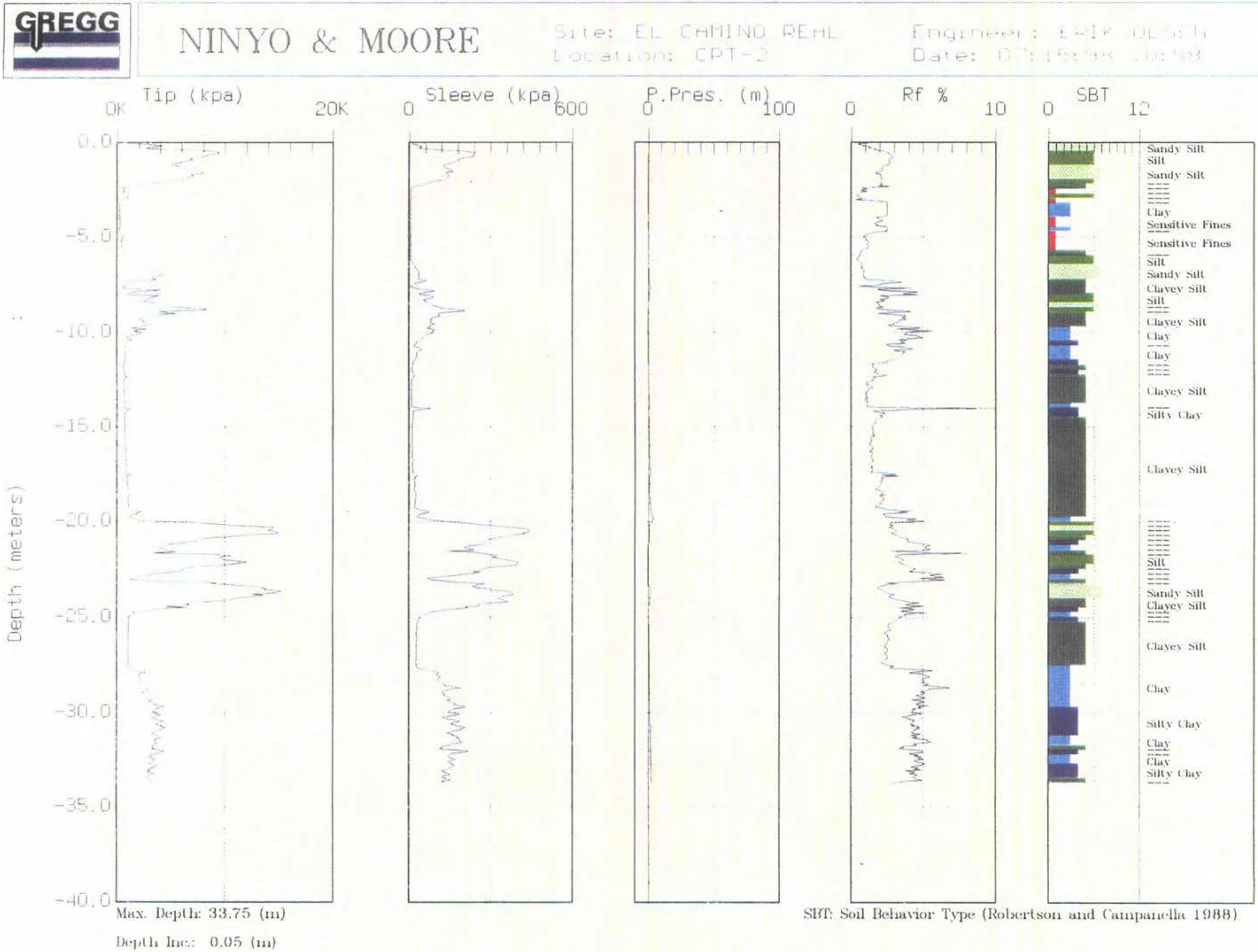
Engineer: ERIK OLSEN
Date: 07:15:98 09:35



Max. Depth: 32.25 (m)

Depth Inc.: 0.05 (m)

SBT: Soil Behavior Type (Robertson and Campanella 1988)


GREGG
NINYO & MOORE
Site: EL CAMINO REAL
Location: CPT-2
Engineer:
Date:
Tip (kpa)
0K
20K
Sleeve (kpa)
0
600
P.Pres. (m)
0
100
Rf %
0
10
SBT
0
12
Depth (meters)
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
Sandy Silt
Silt
Sandy Silt
Clay
Sensitive Fines
Sensitive Fines
Silt
Sandy Silt
Clayey Silt
Silt
Clayey Silt
Clay
Clay
Clayey Silt
Silty Clay
Clayey Silt
Silt
Sandy Silt
Clayey Silt
Clayey Silt
Clay
Silty Clay
Clay
Clay
Silty Clay
Max. Depth: 33.75 (m)
Depth Inc.: 0.05 (m)
SBT: Soil Behavior Type (Robertson and Campanella 1988)

APPENDIX C

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APPENDIX C

BORING LOGS

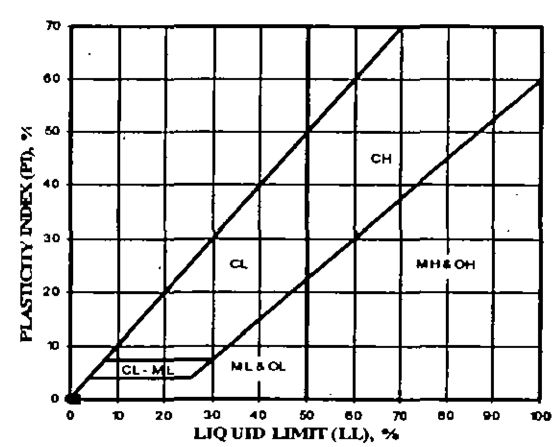
U.S.C.S. METHOD OF SOIL CLASSIFICATION

MAJOR DIVISIONS		SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (More than 1/2 of soil >No. 200 sieve size)	GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size)	GW	Well graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction <No. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (More than 1/2 of soil <No. 200 sieve size)	SILTS & CLAYS Liquid Limit <50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean
		OL	Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS Liquid Limit >50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils

GRAIN SIZE CHART

CLASSIFICATION	RANGE OF GRAIN SIZE	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL Coarse Fine	3" to No. 4 3" to 3/4" 3/4" to No. 4	76.2 to 4.76 76.2 to 19.1 19.1 to 4.76
SAND Coarse Medium Fine	No. 4 to No. 200 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200	4.76 to 0.075 4.76 to 2.00 2.00 to 0.420 0.420 to 0.075
SILT & CLAY	Below No. 200	Below 0.075

PLASTICITY CHART



Ninyo & Moore | U.S.C.S. METHOD OF SOIL CLASSIFICATION

BORING LOG EXPLANATION SHEET

DEPTH (feet)	SAMPLES Bulk / Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	
0							Bulk sample.
							Modified split-barrel drive sampler.
							No recovery with modified split-barrel drive sampler.
							Sample retained by others.
							Standard Penetration Test (SPT).
5							No recovery with a SPT.
		XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
							No recovery with Shelby tube sampler.
							Continuous Push Sample.
							Seepage.
10							Groundwater encountered during drilling.
							Groundwater measured after drilling.
						SM	ALLUVIUM: Solid line denotes unit change.
							Dashed line denotes material change.
15							Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Sheared Bedding Surface
20							The total depth line is a solid line that is drawn at the bottom of the boring.

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BORING LOG

EXPLANATION OF BORING LOG SYMBOLS

PROJECT NO.	DATE	FIGURE
	Rev. 01/03	

DATE DRILLED	06/13/05	BORING NO.	B-7
GROUND ELEVATION	20' ± (MSL)	SHEET	1 OF 1
METHOD OF DRILLING	Hand Auger		
DRIVE WEIGHT	N/A	DROP	N/A
SAMPLED BY	RUB	LOGGED BY RUB	REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	AGRICULTURAL TOPSOIL: Light brown, dry to damp, very loose, silty fine SAND; micaceous, scattered organics.
							SM	ALLUVIUM: Light brown, moist, loose, silty fine SAND; micaceous. Saturated.
5								Total Depth = 4.5 feet. Groundwater encountered during drilling at approximately 4.2 feet. Backfilled with hydrated bentonite with soil cap on 06/13/05.
10								
15								
20								

Ninyo & Moore

BORING LOG

EL CAMINO REAL/SAN DIEGUITO RIVER BRIDGE PROJECT
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645001	06/05	A-1

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 06/13/05 BORING NO. B-8 GROUND ELEVATION 20' ± (MSL) SHEET 1 OF 1 METHOD OF DRILLING Hand Auger DRIVE WEIGHT N/A DROP N/A SAMPLED BY RUB LOGGED BY RUB REVIEWED BY RI **DESCRIPTION/INTERPRETATION**
0							SM	AGRICULTURAL TOPSOIL: Light brown, dry to damp, very loose, silty fine SAND; micaceous.
							SM	ALLUVIUM: Light brown, damp, loose, silty fine SAND; micaceous.
5								
				▽				Saturated.
								Total Depth = 6.2 feet. Groundwater encountered during drilling at approximately 6.0 feet. Backfilled with hydrated bentonite with soil cap on 06/13/05.
10								
15								
20								

Ninyo & Moore

BORING LOG

EL CAMINO REAL/SAN DIEGUITO RIVER BRIDGE PROJECT
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645001	06/05	A-2

DATE DRILLED	06/13/05	BORING NO.	B-9
GROUND ELEVATION	20' ± (MSL)	SHEET	1 OF 1
METHOD OF DRILLING	Hand Auger		
DRIVE WEIGHT	N/A	DROP	N/A
SAMPLED BY	RUB	LOGGED BY	RUB
REVIEWED BY	RI		

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	AGRICULTURAL TOPSOIL: Light brown, dry to damp, loose, silty fine SAND; micaceous, scattered organics.
							SM	ALLUVIUM: Light brown, damp, loose, silty fine SAND; micaceous.
							SP	Light brown, damp, loose, fine SAND; trace silt; micaceous.
5								Moist.
								Saturated.
				▽				Total Depth = 6.0 feet. Groundwater encountered during drilling at approximately 5.6 feet. Caving at 5.6 feet. Backfilled with hydrated bentonite and capped with soil on 06/13/05.
10								
15								
20								

Ninyo & Moore

BORING LOG

EL CAMINO REAL/SAN DIEGUITO RIVER BRIDGE PROJECT
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645001	06/05	A-3

DATE DRILLED	06/13/05	BORING NO.	B-10	
GROUND ELEVATION	20' ± (MSL)	SHEET	1	OF 1
METHOD OF DRILLING	Hand Auger			
DRIVE WEIGHT	N/A	DROP	N/A	
SAMPLED BY	RUB	LOGGED BY	RUB	REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	AGRICULTURAL TOPSOIL: Light brown, dry to damp, very loose, silty fine SAND; micaceous, scattered organics.
	■						ML	Light brown, damp to moist, loose, fine sandy SILT; micaceous.
	■			▽			ML	ALLUVIUM: Light brown, moist, loose, fine sandy SILT; micaceous. Saturated.
5								Total Depth = 4.0 feet. Groundwater encountered during drilling at approximately 2.7 feet. Backfilled with hydrated bentonite and capped with soil on 06/13/05.
10								
15								
20								

Ninyo & Moore

BORING LOG

EL CAMINO REAL/SAN DIEGUITO RIVER BRIDGE PROJECT
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645001	06/05	A-4

Ninyo & Moore
Geotechnical and Environmental Sciences Consultants

FINAL GEOTECHNICAL REPORT
EL CAMINO REAL ROADWAY WIDENING
SAN DIEGO, CALIFORNIA

PREPARED FOR:
Mr. Edgar A. Camerino, P.E.
Rick Engineering Company
5620 Friars Road
San Diego, California 92110

PREPARED BY:
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5710 Ruffin Road
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August 19, 1998
(Revised January 23, 2006)
Project No. 103645001

Ninyo & Moore
Geotechnical and Environmental Sciences Consultants

August 19, 1998
(Revised January 23, 2006)
Project No. 103645001

Mr. Edgar A. Camerino, P.E.
Rick Engineering Company
5620 Friars Road
San Diego, California 92110

Subject: Final Geotechnical Report
El Camino Real Roadway Widening
San Diego, California

Dear Mr. Camerino:

Transmitted herewith is our report titled "Final Geotechnical Report, El Camino Real Widening, San Diego, California." This report presents the findings of our subsurface evaluation, which was performed to provide criteria for the design and construction of the proposed improvements. Our conclusions and recommendations are presented herein.

We appreciate the opportunity to be of service on this project. If you have questions regarding this report, please contact the undersigned.

Respectfully submitted,
NINYO & MOORE

Erik Olsen, G.E.
Chief Geotechnical Engineer

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Distribution: (10) Addressee

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1. INTRODUCTION

In accordance with your request and our proposal, we have performed a geotechnical evaluation for the proposed widening of El Camino Real between Via De La Valle and San Dieguito Road in San Diego, California (Figure 1). A geotechnical bridge foundation report for the widening of the bridge over the San Dieguito River has also been prepared by Ninyo & Moore (1998) and was submitted under a separate cover. This draft report presents our findings, conclusions, and geotechnical recommendations regarding the design and construction of the roadway widening.

2. SCOPE OF SERVICES

Our scope of services included the following:

- Review of readily available published and in-house geotechnical literature, including as-built bridge plans, Caltrans Soil Survey Sheets, topographic maps, geologic maps, fault maps, and stereoscopic aerial photographs.
- Field reconnaissance to observe site conditions and to locate and mark proposed exploratory excavations and Cone Penetrometer Test (CPT) soundings.
- Coordinating and mobilizing for the subsurface exploration. Mark-out of existing underground utilities was conducted through Underground Service Alert (USA).
- Performance of a subsurface evaluation consisting of the excavation, logging, and sampling of six small-diameter exploratory borings and performing two CPT soundings. The borings were drilled to depths of approximately 20 to 96 feet. Soundings CPT-1 and CPT-2 were extended to depths of approximately 106 and 111 feet, respectively. The borings were excavated with a hollow-stem auger drill rig and the CPT soundings were performed with a truck-mounted CPT rig pushing a 10-ton capacity cone.
- Laboratory testing of selected samples, including in-place moisture content and dry density, gradation, Atterberg limits, direct shear, consolidation, corrosivity, and R-value.
- Data compilation and engineering analyses of the information obtained from the background review, subsurface evaluation and laboratory testing. Our engineering analyses included the analysis of seismic design criteria, potential for liquefaction and lateral spread, slope stability, settlement potential, bearing capacity for wall foundations, design earth pressures, pavement design, corrosion potential, and preparation of earthwork guidelines.
- Preparation of this report to present our conclusions and geotechnical recommendations for the proposed project.

Our scope of services did not include an evaluation of environmental considerations at the site. If an environmental evaluation is required, a detailed scope of proposed environmental services and an estimated fee for such services will be provided upon request.

3. SITE DESCRIPTION AND PROPOSED CONSTRUCTION

The planned improvements will include widening of El Camino Real to a four-lane major road, and reconstructing or rehabilitating the existing bridge over the San Dieguito River. The project is to be designed and constructed in two phases. Phase I includes that portion of El Camino Real from Via de la Valle to San Dieguito Road. Phase II, which has not yet been funded, will continue from San Dieguito Road to Half Mile Drive.

El Camino Real and the bridge over the San Dieguito River will be designed and constructed as a modified four-lane major road. The design will include curb, gutter, sidewalk, bike lanes, equestrian trails and crossings, landscaped medians with turn lanes, and traffic signals at intersections.

The existing bridge over San Dieguito River was constructed in 1940 as an approximately 340-foot long by 26-foot 8-inch wide, nine-span reinforced concrete haunched T-girder bridge supported on pier walls with driven concrete pile foundations. The bridge does not have abutment supports, rather, it has short cantilever end spans for approach and departure ramps. Ground elevations along the roadway alignment vary from approximately 3 feet above Mean Sea Level (MSL) in the riverbed, to approximately 13 feet MSL at the top of the riverbanks and along the bottom of the existing roadway embankments and up to approximately 26 feet MSL at the top of the roadway embankments.

The alternatives for bridge widening being considered include the following:

- Widening and retrofitting the existing bridge to serve as a southbound bridge, and constructing a new northbound bridge to the east.
- Replacing the existing bridge with a new bridge.
- Widening and retrofitting the existing bridge on both sides.

The roadway widening alignment will depend on the selected bridge widening alternative. However, based on our conversations with Rick Engineering we understand the roadway will be widened predominately along its east side.

4. FIELD EXPLORATION

Our subsurface evaluation at the site consisted of advancing six exploratory small-diameter borings on May 12 through May 15, 1998 and advancing two CPT soundings on July 15, 1998. The purposes of the borings and soundings were to collect soil samples and to evaluate the foundation characteristics of the underlying soils.

The borings were drilled to depths of approximately 20 to 96 feet. Soundings CPT-1 and CPT-2 were extended to depths of approximately 106 feet and 111 feet, respectively. The borings were excavated with 8-inch diameter hollow stem auger and the CPT soundings were performed with a truck-mounted CPT rig pushing a 10-ton capacity cone. The approximate locations of the borings and CPT soundings are indicated on the Site Plan (Figure 2). The borings were continuously logged by a representative of our firm. Detailed descriptions of the materials encountered are presented on the boring logs in Appendix A. CPT sounding logs are presented in Appendix C. Relatively undisturbed and bulk samples were obtained at selected intervals and transported to our laboratory for testing.

5. LABORATORY TESTING

Laboratory testing of representative soil samples included in-situ moisture content and dry density, direct shear, gradation, Atterberg limits, consolidation, corrosivity, and R-value tests.

The results of the moisture content and dry density tests are recorded on the boring logs in Appendix A. The other laboratory test results, including plots of the direct shear data, are presented in Appendix B.

6. GEOLOGY AND SUBSURFACE CONDITIONS

The following sections describe geologic, soil, and groundwater conditions at the project alignment. Faulting, seismicity, and liquefaction potential at the site are also addressed.

6.1. Site Geology

Based on our geologic reconnaissance, our subsurface exploration, review of published geologic maps of the area, as well as our review of stereoscopic aerial photographs, the geologic units present in the study area consist of fill and alluvium.

6.1.1. Fill

Fill soil was encountered in borings B-1 through B-3, B-5 and B-6 to depths of 2 to 13 feet. The fill consisted generally of light brown to dark brown and reddish brown, damp to moist, very loose to medium dense, silty and clayey sand, and firm sandy clay.

6.1.2. Alluvium

Alluvium was encountered in boring B-4 from the ground surface, and underlying the fill in the other borings, to the total depth explored. The material consisted generally of brown to dark brown, dark gray and black, moist to saturated, very loose to dense, silty to clayey sand and fine sand, and saturated, very soft to firm, silty clay to clayey silt. Cobbles were also encountered in borings B-3, B-4, and B-6.

6.2. Groundwater

Groundwater was encountered at approximate depths ranging from 7 to 19.5 feet (elevations ranging from +2.5 to +12 feet MSL). Local fluctuations in groundwater levels may occur due to storm water flow in the San Dieguito River and due to variations in ground surface topography, subsurface geologic conditions, rainfall, irrigation, and other factors.

6.3. Geologic Constraints

Geologic constraints which may have an impact on the proposed improvements are described in the following sections.

6.3.1. Faulting and Seismicity

The subject site is considered to be in a seismically active area, as is most of southern California. Based on our review of referenced geologic maps and stereoscopic aerial photographs, no active faults are known to cross the subject site. Table 2 lists known active and potentially active fault zones within approximately 60 miles of the site, the estimated maximum credible seismic events which could occur on these faults, and the predicted ground accelerations at the site associated with these events.

Table 1 – Seismic Parameters for Maximum Credible Earthquakes

Fault	Fault-to-Site Distance (miles)[1]	Maximum Credible Earthquake Magnitudes[1]	Estimated Acceleration (g)	
			Peak Horizontal Bedrock[2]	Repeatable High Ground[3]
Agua Blanca–Coronado Bank	17	7.7	0.28	0.18
Newport Inglewood	38	7.0	0.07	0.07
Offshore Zone of Deformation	19	7.0	0.16	0.10
Point Loma	15	6.5	0.15	0.10
Rose Canyon	4	7.0	0.47	0.30
San Clemente	51	7.3	0.05	0.05
San Diego Trough	27	7.7	0.19	0.19
San Miguel–Vallecitos	48	7.0	0.05	0.05
Whittier–Elsinore	31	7.5	0.13	0.13

Notes:
[1] After Anderson et al., 1989, and Mualchin and Jones 1992
[2] Mualchin and Jones 1992
[3] Ploessel and Slosson 1974

Seismic hazards at the site can be attributed to ground shaking resulting from events on active faults. In general, seismic hazards might include strong ground motion, liquefaction, lateral spread, ground surface rupture, and damage caused by seismically induced settlement. These potential hazards are discussed in the following sections.

6.3.2. Strong Ground Motion

Analysis of possible earthquake accelerations associated with the assigned maximum credible earthquake indicates that the most significant seismic event at the site would be a magnitude 7.0 earthquake on the Rose Canyon fault located approximately 4 miles west of the site. The estimated peak horizontal acceleration produced at the site by such an event would be approximately 0.47g with a repeatable high ground acceleration of 0.30g. The Caltrans Seismic Hazard Map (1996) indicates that the site has the potential for a 0.5g peak acceleration. Therefore, based on the proximity to active and potentially active faults capable of producing large earthquakes, the subject site has a high potential for experiencing strong ground motion.

6.3.3. Ground Surface Rupture

Ground surface rupture due to faulting is considered unlikely at the project site due to the absence of known active and potentially active faults at the site. The potential for lurching or cracking of the surface as a result of nearby or distant seismic events is also considered unlikely.

6.3.4. Liquefaction and Dynamic Settlement

Liquefaction of cohesionless soils can be caused by strong vibratory motion due to earthquakes. Research and historical data indicate that loose granular soils (with silt contents less than approximately 35 percent and clay contents less than approximately 20 percent) which are saturated by a relatively shallow groundwater table are most susceptible to liquefaction. Due to the presence of a shallow groundwater table and relatively loose granular soils at the site, the potential for liquefaction is considered to be high. Our evaluation of site conditions indicates liquefaction may occur at elevations of 0 to 20 feet below MSL and at elevations of 43 to 56 feet below MSL within layers of loose and sandy alluvium in the event of a major earthquake on a local fault. We estimate that liquefaction could induce approximately 2 to 12 inches of dynamic settlement at the site. CPT-1 encountered loose sandy material at elevations of 0 to 20 feet and 43 to 56 feet below MSL, while CPT-2 encountered much less liquefiable material, at elevations of 5 to 8 feet below MSL.

Based on our subsurface exploration, the potential for liquefaction and dynamic settlement is expected to be variable across the site, based on the variable and sinuous deposition of sandy river channel deposits across the river valley.

6.3.5. Lateral Spread

Lateral spread is a liquefaction-induced ground failure in which blocks of mostly intact surface soil displace downslope or towards a free face along a shear zone that has formed within the liquefied sediment. The potential for lateral spread of the bridge approach embankments was evaluated based on a method described by Bartlett and Youd (1995). Our evaluation assumed liquefaction of a 20-foot thick soil layer below a 26-foot high embankment. Based on our evaluation, the bridge approach embankments may be susceptible to horizontal ground displacements of roughly three to ten feet as a result of liquefaction-induced lateral spread in the event of a major nearby earthquake. Various mitigative measures that may be considered to reduce the potential for lateral spread are discussed in the recommendations section of this report.

7. CONCLUSIONS

Based on the results of our geotechnical evaluation, it is our opinion that the proposed El Camino Real widening project is feasible from a geotechnical standpoint provided that the recommendations presented in this report are incorporated into its design and construction. Major factors which may affect the construction of the proposed project include:

- The project alignment is underlain by fill soils and alluvium. The alluvium consists of saturated, loose sands and soft silts and clays.
- In our opinion, the alluvium at the site may be potentially compressible, and therefore presents the risk of settlement under the addition of fill or structural loads. Due to the relatively shallow groundwater present at the site, the removal of much of the compressible material may not be practical. Possible alternatives for reducing the potential for settlement at the site include preloading fill areas with optional use of vertical strip drains.
- Due to the presence of shallow groundwater, and the locally loose and granular nature of the soils, the alluvium may be subject to liquefaction, dynamic settlement and lateral spread if subjected to shaking due to the design earthquake. Based on our calculations, should lique-

faction occur, resulting dynamic settlement may be on the order of up to 1 foot, and lateral spread may cause horizontal ground displacements of the bridge approach embankments of roughly 3 to 10 feet.

- Possible alternatives for reducing the potential for consolidation settlement, liquefaction, dynamic settlement and lateral spread at the site include improving the soil in-place using vibro-compaction, vibro-replacement, or heavy tamping methods.
- Based on the results of minimum resistivity and chloride content testing performed on selected samples, the site soils may be considered to be severely corrosive to ferrous materials. In accordance with Caltrans guidelines, the project site may be considered to be corrosive.

8. RECOMMENDATIONS

Based on the results of our subsurface evaluation and our understanding of the proposed construction, we present the following geotechnical recommendations relative to the design and construction of the proposed roadway improvements.

8.1. Grading

The following sections present recommendations for grading for the improvements addressed in this report. Based on our understanding of the project, the proposed improvements will include widening of El Camino Real to a four-lane major road from Via de la Valle to San Dieguito Road. The design will include curb, gutter, sidewalk, bike lanes, equestrian trails and crossings, landscaped medians with turn lanes, and traffic signals at intersections. We understand that the roadway widening will be primarily along the east side of El Camino Real, and may involve placing embankment up to approximately 13 feet above existing site grade.

8.1.1. Site Preparation

Prior to placement of fill associated with the construction of the proposed improvements, the surface area within the improvement footprints and extending laterally 5 feet beyond the footprints, should be cleared of any surface obstructions and stripped of brush, vegetation, and undocumented fills. Vegetation and debris from the clearing operations should be removed from the site and disposed of at a legal dump site. Obstructions which extend below finish grade, if present, should be removed and the resulting holes filled with compacted soil. Existing pavement sections, such as shoulders, if removed, can be broken up and used in fill areas.

Subsequent to clearing and grubbing, we recommend that, in areas to receive fill, the upper approximately 6 inches of exposed material be scarified and compacted to 95 or more percent of the maximum dry density as evaluated by the American Society for Testing and Materials (ASTM) D1557. Material with a sand equivalent less than 10 should not be placed in the upper 2.5 feet of the embankment.

8.1.2. Fill Placement and Compaction

Fill associated with the proposed improvements and that placed as trench backfill should be brought to a moisture content slightly above optimum and compacted to 90 or more percent of the maximum dry density as evaluated by ASTM D1557. Fill within the width of the roadway, as defined by the outside edge of the shoulders, and within the upper 6 inches of subgrade soils beneath the pavement section should be compacted to a relative compaction of 95 or more percent. In addition, soils within 2.5 feet of finish grade for the width of the traveled way, plus 3 feet on either side, should be compacted to 95 or more percent of the maximum density. These recommendations apply regardless of whether the roadway is in cut or fill.

Expansive clay material, if encountered, should either be disposed of offsite, placed in non-structural fills, or, if placed in structural fills, be placed and compacted at a moisture content at 2 or more percent above optimum as evaluated by ASTM D1557. Expansive material should be mixed with sandier material and placed in the lower portion of embankments and not near final grade or slope faces. The geotechnical consultant should evaluate the expansiveness of the on-site soils during grading, utilizing either visual and field methods or laboratory testing, as warranted.

8.1.3. Slopes

Based on our understanding of the proposed project, portions of the roadway will be constructed on existing embankment fill or newly constructed embankments. We recommend that keys be excavated at the toes of proposed or reconstructed embankments. The keyways should be one equipment-width or more wide and should be excavated 2 or more feet into competent fill or alluvium, as evaluated by the project geotechnical consultant. The proposed embankments should also be properly benched into hillsides or existing embankments.

To achieve compaction of embankment slope faces, the embankment slopes may be overbuilt, compacted, and cut back to finish grade, or compacted at the slope face by mechanical means. With the exception of the areas described in Section 8.1.2, fill soils placed during the construction of roadway embankments should be compacted to 90 or more percent of the maximum density as evaluated by ASTM D1557. Material within the upper 2.5 feet of finish grade should have a sand equivalent of 10 or more.

Embankment slopes should be hydroseeded with drought-tolerant vegetation as soon as practicable after construction and irrigation should be kept to the minimum necessary to maintain plant vigor. Embankment slopes should be protected from erosion

8.1.4. Surface and Subsurface Drainage

Surface drainage should be directed away from the tops of slopes and should not be allowed to pond at the toes of slopes. Positive drainage should be established at the toes of all slopes and surface water should be directed offsite by means of appropriate erosion-reducing devices. Runoff should not be allowed to flow over the tops of slopes.

8.2. Pavement Structural Section Design

Pavement sections associated with the proposed improvements will include widening of El Camino Real to a four-lane major road, as well as the improvements to the intersections with San Dieguito Road and Via de la Valle. The pavement sections for the El Camino Real widening are based on City of San Diego Standard Drawings (1995), and R-value test results from our subsurface evaluation.

Two samples of soil from the proposed areas of improvement were tested and found to have resistance values (R-value) shown in Table 2.

Table 2 – R-Value Test Results

Location	Sample Depth (ft)	Soil Description	R-Value
B-2	0-5	Silty Sand	44*
B-6	0-5	Clayey Sand	13**

* Indicates R-value by expansion.
** Indicates R-value by exudation.

An average daily traffic (ADT) value of 30,000 for improvement of El Camino Real to a four lane major road was provided by the City of San Diego following City of San Diego standards. This ADT value and an R-value of 13 were chosen for design of the pavement sections. The recommended pavement structural section for this roadway is presented in Table 3.

Table 3 – Pavement Structural Section – City of San Diego Criteria

Location	Design R-Value	Average Daily Traffic	AC (in)	CTB (in)	Total Thickness (in)
El Camino Real	13	30,000	5.5	18.0	23.5

Legend: AC = Asphalt Concrete
CTB = Cemented Treated Base

8.3. Slope Stability

Slope stability analyses were performed for the fill slopes anticipated for the roadway widening. The slopes are anticipated to be up to approximately 13 feet high, with inclinations of 2:1 (horizontal:vertical) or flatter. Stability analyses were performed by the PCSTABL computer program (Purdue University, 1988). Shear strength parameters used in our analyses were based on laboratory test results performed on samples obtained from the exploratory borings, and our professional judgment. The shear strength parameters used in our analyses are presented in Table 4.

Table 4 – Slope Stability Shear Strength Parameters

Geologic Unit	Total Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)
Fill	120	32	200
Alluvium	118	30	300

The slopes were also analyzed to evaluate the effect of a seismic event on the gross stability of the subject slopes using the pseudo-static subroutine of the PCSTABL5M program. Intensive iterations using the subroutines discussed previously yielded what we consider to be the critical failure surfaces. Our analyses indicated that the calculated factors of safety for deep-seated stability of the fill slopes were greater than 1.5 for the static case and 1.2 for pseudostatic conditions.

The surficial stability of the proposed fill slopes was also evaluated. Our analyses indicated that the fill slopes have a safety factor greater than 1.5 for surficial stability.

8.4. Settlement Considerations

Based on our subsurface exploration program, the roadway embankment at the site will be underlain by alluvium. Our analyses indicate that long-term settlement as a result of placing embankment fill for the bridge approach embankment may be up to approximately 14 inches. Settlements beneath the roadway embankments to the north and south of the bridge are anticipated to decrease roughly in proportion to the thickness of new embankment to be placed. Approximately half of the settlement is anticipated to occur during grading. Based on our analyses and understanding of the proposed improvements, monitoring of embankment settlements may be warranted. If ground improvement methods discussed in the following section are implemented, long-term settlements may be substantially reduced.

Our analyses were based on the assumption that existing fills and the upper foot of surficial soil will be excavated and the suitable excavated material will be moisture conditioned, placed and compacted to 95 or more percent relative compaction in accordance with ASTM D1557. Approach embankments and structure approach slabs should be constructed in accordance with the recommendations presented in the bridge foundation report (Ninyo & Moore, 1998).

8.5. Ground Improvement

As discussed above, the sandy alluvium at the site may be subject to liquefaction, dynamic settlement and lateral spread if subjected to shaking due to the design earthquake. Based on our calculations, should liquefaction occur, resulting dynamic settlement may be on the order of up to 1 foot, and lateral spread may cause horizontal ground displacements of the approach embankments of roughly three to ten feet. If these effects are not tolerable for the planned structure, the use of in-situ ground improvement at the site may be considered. Possible ground improvement methods that may be appropriate at the site include vibro-densification, vibro-replacement (stone columns) and deep dynamic compaction. The purpose of these methods would be to densify the loose alluvium and remove its potential for liquefaction and associated dynamic settlement and lateral spread. The ground improvement plan should be evaluated by a specialty contractor. If requested, we can consult with specialty contractors, and provide a subsurface model to assist in developing an appropriate ground improvement scheme.

8.6. Corrosion

The corrosion potential of the on-site materials was based on analyses of corrosivity tests performed on samples from the subsurface evaluation. The soils were analyzed to evaluate the effect of corrosion on underground culverts and surface structures. The samples obtained were considered representative of soils at various locations within the limits of the subject project. The results of the corrosivity tests are included in Appendix B.

The corrosion potential of the soils was analyzed to evaluate the effect of corrosion on proposed concrete surface structures. The analyses were performed in general accordance with CTM 417, 422 and 643. Our evaluation was performed in general accordance with CTM 532 and 643, along with Chapter 800 of the Caltrans Highway Design Manual and the Caltrans computer program

CULVERT2 (Caltrans, 1992). In accordance with Caltrans specifications, a 50-year maintenance-free design life was used in our evaluation of appropriate culvert materials.

Test results indicate that the pH of the soils ranged from 6.8 to 7.8. Tested chloride contents ranged from 20 to 1,000 parts per million (ppm), which indicates a potential for severely corrosive conditions for ferrous metals. Testing of selected soil samples indicated that soluble sulfate contents ranged from 0.003 to 0.124 percent, which indicates a potential for moderate corrosion to cement. Minimum electrical resistivity, which ranged from 300 to 7,500 ohm-cm, indicates that the on-site soils may be considered severely corrosive to ferrous metals.

The recommendations resulting from our evaluation of the corrosivity of the on-site soils also apply to import embankment material. Import materials should be tested for corrosive properties prior to placement. We recommend that imported embankment materials have low-corrosivity. Low-corrosivity materials are defined in the Corrosion Guidelines (Caltrans, 2003a) as soil containing less than 500 ppm of chlorides, less than 0.20 percent sulfates, or having a pH of more than 5.5.

8.6.1. Culverts

The proposed improvements may include the installation of new drainage systems consisting of underground culverts and surface drainage improvements. The locations and types of proposed new culverts were not available at the time of our evaluation. We understand that the City of San Diego does not allow the use of corrugated metal pipe (CMP) for culverts. Accordingly, as an alternate, we recommend the use of either reinforced concrete pipe or plastic pipe.

8.6.2. Cement Type

Concrete in content with soil or water that contains high concentrations of sulfates can be subject to chemical deterioration. Testing of selected soil samples indicated that soluble sulfate contents ranged from 0.003 to 0.124 percent, which indicates a potential for moderate corrosion to cement. Accordingly, we recommend that Type V Portland cement be used in concrete for structures along the alignment. The reinforcing should have a minimum cover of 3 inches of concrete.

9. CONSTRUCTION OBSERVATION

The recommendations in this report are based on preliminary structural design information for the proposed construction and subsurface information disclosed by our geotechnical evaluation and review of previous site evaluation reports. The assumed subsurface conditions should be checked in the field by the Caltrans geotechnical engineer during construction. If actual conditions differ considerably from the information provided in this report, Ninyo & Moore should be contacted.

10. LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

11. SELECTED REFERENCES

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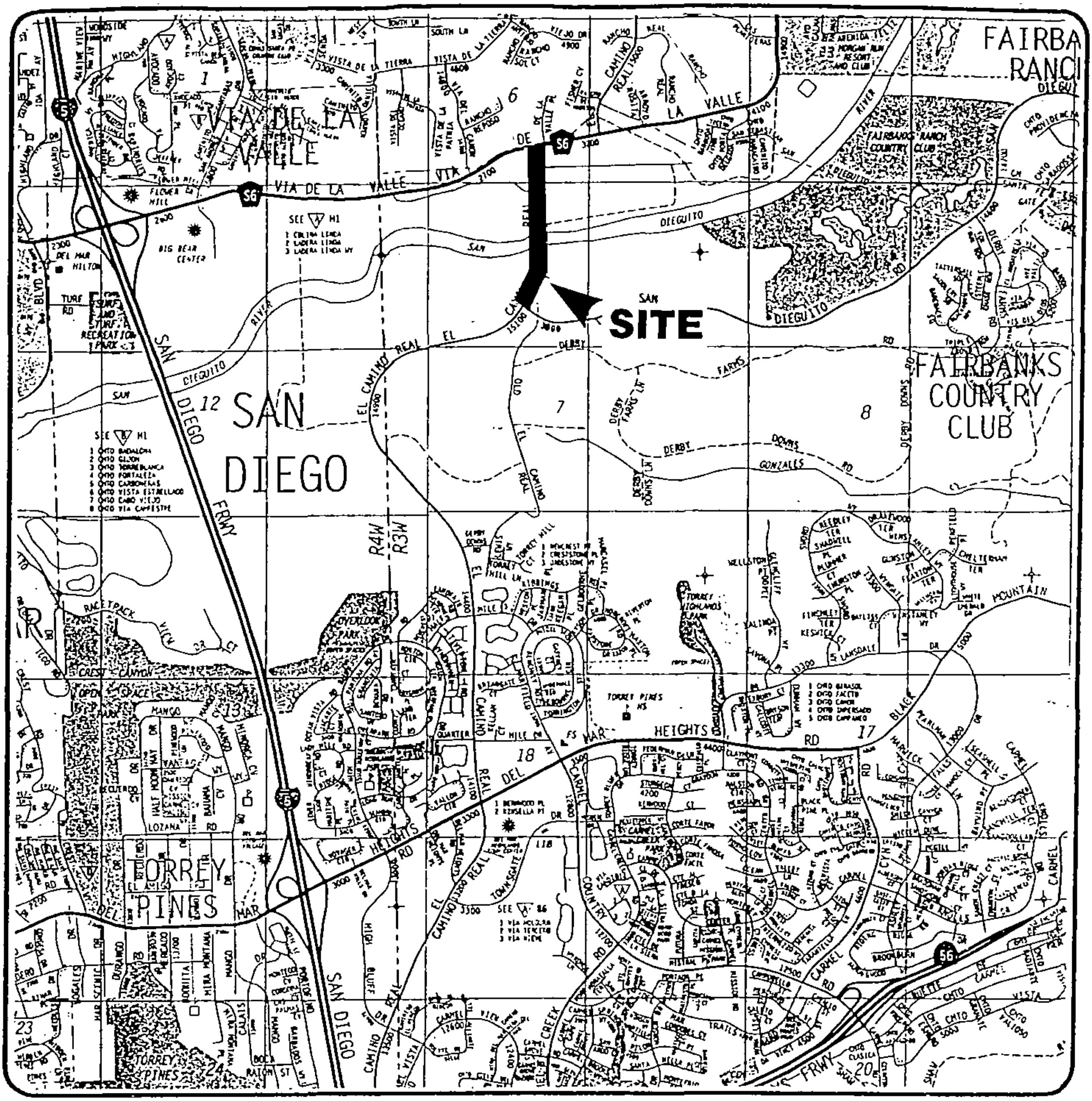
AERIAL PHOTOGRAPHS

Source	Date	Flight No.	Photo No.	Scale
USDA	4/11/53	AXN-8M	10 and 11	1:20,000



REFERENCE: 1997 Thomas Guide for San Diego County, Street Guide and Directory

NORTH

0 2400 4800

Approximate Scale in Feet

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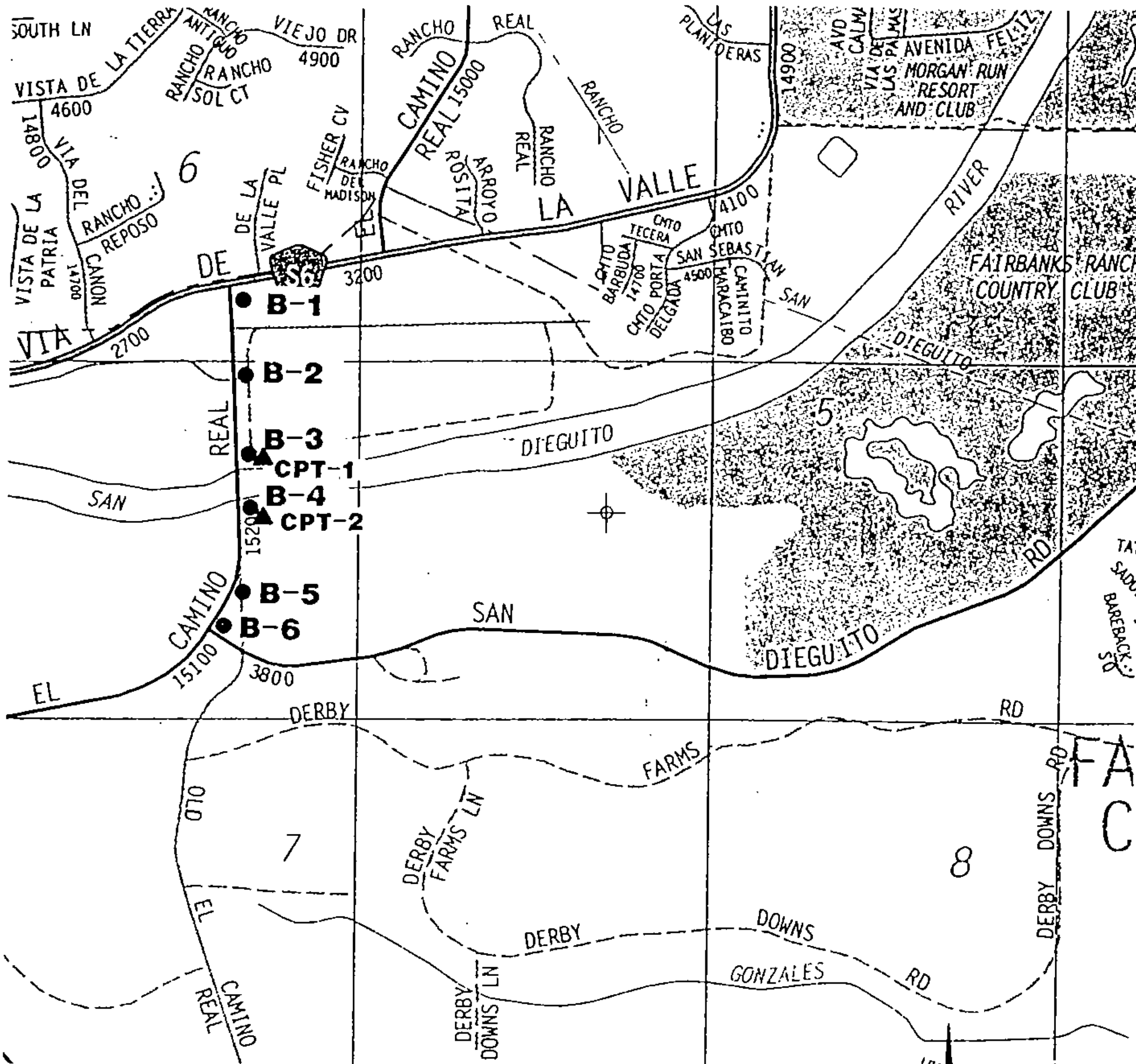
SITE LOCATION MAP

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	8/98	1



LEGEND

● **B-6** Approximate boring location

▲ **CPT-2** Approximate CPT sounding location

N

NO SCALE

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SITE PLAN AND BORING/CPT LOCATION MAP

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	8/98	2

APPENDIX A

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APPENDIX A

BORING LOGS

Field Procedure for the Collection of Disturbed Samples
Disturbed soil samples were obtained in the field using the following methods.

Bulk Samples
Bulk samples of representative earth materials were obtained from the exploratory excavations. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test (SPT) Spoon
Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test spoon sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of 1-3/8 inches. The spoon was driven into the ground 12 to 18 inches with a 140-pound hammer free-falling from a height of 30 inches in general accordance with ASTM D 1586. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the spoon, bagged, sealed and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples
Relatively undisturbed soil samples were obtained in the field using the following methods.

The Modified Split-Barrel Drive Sampler
The sampler, with an external diameter of 3.0 inches, was lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a hammer rig in general accordance with ASTM D 3550. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer, and the number of blows per foot of driving are presented on the boring logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

BORING LOG EXPLANATION SHEET

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	
0								Bulk sample.
								Modified split-barrel drive sampler.
								No recovery with modified split-barrel drive sampler.
								Sample retained by others.
								Standard Penetration Test (SPT).
5								No recovery with a SPT.
			XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
								No recovery with Shelby tube sampler.
								Continuous Push Sample.
								Seepage.
10								Groundwater encountered during drilling.
								Groundwater measured after drilling.
							SM	ALLUVIUM: Solid line denotes unit change.
								Dashed line denotes material change.
								Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Sheared Bedding Surface
15								
								The total depth line is a solid line that is drawn at the bottom of the boring.
20								

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BORING LOG

EXPLANATION OF BORING LOG SYMBOLS

PROJECT NO.	DATE	FIGURE
	Rev. 01/03	

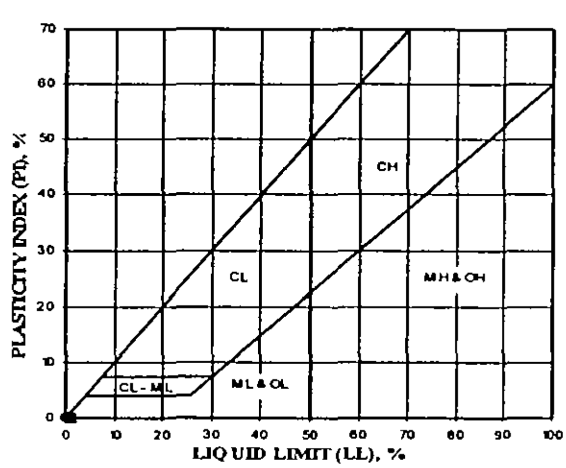
U.S.C.S. METHOD OF SOIL CLASSIFICATION

MAJOR DIVISIONS		SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (More than 1/2 of soil >No. 200 sieve size)	GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size)	GW	Well graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction <No. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (More than 1/2 of soil <No. 200 sieve size)	SILTS & CLAYS Liquid Limit <50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean
		OL	Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS Liquid Limit >50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils

GRAIN SIZE CHART

CLASSIFICATION	RANGE OF GRAIN SIZE	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL Coarse Fine	3" to No. 4 3" to 3/4" 3/4" to No. 4	76.2 to 4.76 76.2 to 19.1 19.1 to 4.76
SAND Coarse Medium Fine	No. 4 to No. 200 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200	4.76 to 0.075 4.76 to 2.00 2.00 to 0.420 0.420 to 0.075
SILT & CLAY	Below No. 200	Below 0.075

PLASTICITY CHART



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U.S.C.S. METHOD OF SOIL CLASSIFICATION

DATE DRILLED	5/12/98	BORING NO.	B-1
GROUND ELEVATION	15.0' (MSL)	SHEET	1 OF 2
METHOD OF DRILLING	8" Diameter Hollow-Stem Auger		
DRIVE WEIGHT	140 lbs.	DROP	30"
SAMPLED BY	RCS	LOGGED BY	RCS
REVIEWED BY	RI		

DEPTH (feet)	SAMPLES Bulk / Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	Bulk					SM	FILL: Light brown to brown, damp to moist, very loose, silty fine SAND; with rootlets.
	Bulk, Driven	8	17.3	92.2		ML	ALLUVIUM: Brown to dark brown, moist, soft, fine sandy clayey SILT; micaceous; plastic.
5	Driven	3	35.8	78.3			Wet.
			⊽				Saturated.
10	Driven	5	43.2	80.7			
15							
	Driven	4	42.5	80.3			
20							

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-1

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 5/12/98 BORING NO. B-1 GROUND ELEVATION 15.0' (MSL) SHEET 2 OF 2 METHOD OF DRILLING 8" Diameter Hollow-Stem Auger DRIVE WEIGHT 140 lbs. DROP 30" SAMPLED BY RCS LOGGED BY RCS REVIEWED BY RI **DESCRIPTION/INTERPRETATION**
								Total Depth = 20 feet. Groundwater encountered during drilling at 9 feet. Backfilled on 5/12/98.
25								
30								
35								
40								

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-2

DATE DRILLED 5/12/98 BORING NO. B-2

GROUND ELEVATION 15.5' (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" Diameter Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY RCS LOGGED BY RCS REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown to reddish brown, moist, loose, fine silty SAND; micaceous.
							ML	ALLUVIUM: Brown to dark brown, moist, firm, slightly clayey SILT; micaceous.
			10	15.9	102.1			
5			11	24.5	95.0			Wet.
				⊻				Saturated.
10			4	48.4	76.7			Very soft.
15							SM	Tan to light gray, saturated, loose, silty fine SAND; micaceous.
			14	34.8	87.1			
20								

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-3

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
								Total Depth = 20 feet. Groundwater encountered during drilling at 7 feet. Backfilled on 5/12/98.
25								
30								
35								
40								

DATE DRILLED 5/12/98 BORING NO. B-2

GROUND ELEVATION 15.5' (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" Diameter Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY RCS LOGGED BY RCS REVIEWED BY RI

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-4

DATE DRILLED 5/15/98 BORING NO. B-3

GROUND ELEVATION 14.5' (MSL) SHEET 1 OF 5

METHOD OF DRILLING 8" Diameter Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY EO LOGGED BY EO REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							CL	FILL: Dark brown, moist, firm, sandy CLAY.
5			22	15.0	103.0		SM	ALLUVIUM: Dark brown, moist, medium dense, silty fine SAND; micaceous. Wet.
				⊽				Saturated.
10			5	26.1	97.3			Very loose.
							SP	Dark brown, saturated, loose, fine SAND; micaceous.
15			6	33.1				
20								

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-5

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20							SP	ALLUVIUM: (Continued) Dark brown, saturated, loose, fine SAND.
25								
							ML	Black, saturated, loose, SILT; micaceous.
30			7	39.9	83.9			
								Clayey; shell fragments.
35			Push	48.3				
40								

DATE DRILLED 5/15/98 BORING NO. B-3

GROUND ELEVATION 14.5' (MSL) SHEET 2 OF 5

METHOD OF DRILLING 8" Diameter Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY EO LOGGED BY EO REVIEWED BY RI

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-6

DATE DRILLED	5/15/98	BORING NO.	B-3
GROUND ELEVATION	14.5' (MSL)	SHEET	3 OF 5
METHOD OF DRILLING	8" Diameter Hollow-Stem Auger		
DRIVE WEIGHT	140 lbs.	DROP	30"
SAMPLED BY	EO	LOGGED BY	EO
REVIEWED BY	RI		

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40			Push	45.9			ML	ALLUVIUM: (Continued) Black, saturated, very soft, clayey SILT; micaceous; shell fragments.
45			4					
							CH	Black, saturated, very soft, CLAY; micaceous; shell fragments.
50			Push	43.6				
55								
							SM	Dark gray, saturated, dense, silty fine SAND; micaceous.
60								

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-7

DATE DRILLED 5/15/98 BORING NO. B-3

GROUND ELEVATION 14.5' (MSL) SHEET 4 OF 5

METHOD OF DRILLING 8" Diameter Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY EO LOGGED BY EO REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
60			23				SM	ALLUVIUM: (Continued) Dark gray, saturated, dense, silty fine SAND; micaceous.
65								
							ML	Black, saturated, soft, clayey SILT; micaceous.
70			16					
							SM	Dark gray, saturated, medium dense, silty fine SAND; micaceous.
75								
							ML	Black, saturated, medium dense, fine sandy SILT; micaceous.
80								

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-8

DATE DRILLED 5/15/98 BORING NO. B-3

GROUND ELEVATION 14.5' (MSL) SHEET 5 OF 5

METHOD OF DRILLING 8" Diameter Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY EO LOGGED BY EO REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
80		■	20				ML	ALLUVIUM: (Continued) Black, saturated, medium dense, fine sandy SILT; micaceous.
							SP-SM	Dark gray, saturated, medium dense, slightly silty fine SAND; micaceous.
85								
							GM	Cobbles. Refusal at 90'.
90								Total Depth = 90 feet. Groundwater encountered during drilling at 8 feet. Backfilled on 5/15/98.
95								
100								

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-9

DATE DRILLED 5/14/98 BORING NO. B-4

GROUND ELEVATION 16.0' (MSL) SHEET 1 OF 5

METHOD OF DRILLING 8" Diameter Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY EO LOGGED BY EO REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ALLUVIUM: Dark brown, damp, medium dense, silty fine SAND; micaceous.
5			18	5.8	100.2			
10			14	19.4	105.5			Wet.
				▽				
							SM + ML	Interlayered black, saturated, loose, fine sandy SILT and dark brown, silty fine SAND; micaceous.
15			3					
							SM	Dark gray, saturated, loose, silty fine to medium SAND; micaceous.
20								

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-10

DATE DRILLED 5/14/98 BORING NO. B-4

GROUND ELEVATION 16.0' (MSL) SHEET 2 OF 5

METHOD OF DRILLING 8" Diameter Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY EO LOGGED BY EO REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20		■	14	23.2	103.4		SM	ALLUVIUM: (Continued) Dark gray, saturated, loose, fine to medium, silty SAND; micaceous.
25		◩	3	45.4				
							ML	Black, soft, saturated, firm, clayey SILT; micaceous.
							SM	Dark brown to black, saturated, loose, silty fine SAND; micaceous.
30		■	10	39.2	85.9			
							ML	Black, very loose, fine sandy SILT; micaceous; shell fragments.
35		◩	Push	48.0				
							SM	Dark brown, saturated, very loose, silty fine SAND; micaceous.
40								

DEPTH (feet)	SAMPLES Bulk / Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 5/14/98 BORING NO. B-4 GROUND ELEVATION 16.0' (MSL) SHEET 3 OF 5 METHOD OF DRILLING 8" Diameter Hollow-Stem Auger DRIVE WEIGHT 140 lbs. DROP 30" SAMPLED BY EO LOGGED BY EO REVIEWED BY RI **DESCRIPTION/INTERPRETATION**
40		5				SM	ALLUVIUM: (Continued) Dark brown, saturated, very loose, silty fine SAND; micaceous.
						CH	Dark gray, saturated, very soft, CLAY; micaceous; shell fragments.
45		1	44.2				
						SM	Dark gray, saturated, loose, silty fine SAND; micaceous.
50		9					
55							
						SC	Dark gray, saturated, medium dense, clayey fine SAND; micaceous.
60							

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-12

DATE DRILLED 5/14/98 BORING NO. B-4

GROUND ELEVATION 16.0' (MSL) SHEET 4 OF 5

METHOD OF DRILLING 8" Diameter Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY EO LOGGED BY EO REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
60			20	28.5			SC	ALLUVIUM: (Continued) Dark gray, saturated, medium dense, clayey fine SAND; micaceous.
65							SM	Dark gray, saturated, very loose, silty fine SAND; micaceous.
70			2					
75							CL	Dark reddish brown, saturated, very stiff, fine sandy CLAY; micaceous.
80								

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-13

DATE DRILLED 5/14/98 BORING NO. B-4

GROUND ELEVATION 16.0' (MSL) SHEET 5 OF 5

METHOD OF DRILLING 8" Diameter Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY EO LOGGED BY EO REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
80							CL	ALLUVIUM: (Continued) Dark reddish brown, saturated, very stiff, fine sandy CLAY; micaceous.
			20	19.0				
85							SP-SM	Reddisb brown, saturated, medium dense, slightly silty fine to medium SAND; micaceous.
90								
				20.0				
								Driller reports cobbles from 92.5' to 94'.
								Tan; very dense.
95								
			37	17.2				
								Total Depth = 96.5 feet. Groundwater encountered during drilling at 12 feet. Backfilled on 5/14/98.
100								

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-14

DATE DRILLED	5/12/98	BORING NO.	B-5
GROUND ELEVATION	22.0' (MSL)	SHEET 1 OF 2	
METHOD OF DRILLING	8" Diameter Hollow-Stem Auger		
DRIVE WEIGHT	140 lbs.	DROP	30"
SAMPLED BY RCS	LOGGED BY RCS	REVIEWED BY	RI

DEPTH (feet)	SAMPLES Bulk / Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	FILL: Light brown, moist, loose, clayey fine to medium SAND; scattered rootlets; light reddish brown mottles.
		11	17.6	103.9			
5		28	12.9	112.6			Light brown to reddish brown; medium dense; trace gravel.
10		36	13.1	111.3			Cobbles; light brown to grayish brown.
						ML	ALLUVIUM: Dark gray to black, moist to wet, firm, fine sandy clayey SILT; micaceous.
15		7	40.7	80.9			
		8	33.9	83.6			Saturated.
20							

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-15

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 5/12/98 BORING NO. B-5 GROUND ELEVATION 22.0' (MSL) SHEET 2 OF 2 METHOD OF DRILLING 8" Diameter Hollow-Stem Auger DRIVE WEIGHT 140 lbs. DROP 30" SAMPLED BY RCS LOGGED BY RCS REVIEWED BY RI **DESCRIPTION/INTERPRETATION**
								Total Depth = 20 feet. Groundwater encountered during drilling at 19.5 feet. Backfilled on 5/12/98.
25								
30								
35								
40								

Ninyo & Moore

BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-16

DATE DRILLED 5/12/98 BORING NO. B-6

GROUND ELEVATION 22.0' (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" Diameter Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY RCS LOGGED BY RCS REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SC	FILL: Light brown to reddish brown, moist, medium dense, clayey fine to medium SAND; intermixed with light gray siltstone chunks up to 1" across.
			29	19.3	106.3			
5			29	16.6	109.0			Light brown to reddish brown; medium dense; trace gravel.
							ML	ALLUVIUM: Dark gray to black, moist, stiff, fine sandy clayey SILT; micaceous; trace gravel.
10			14	29.9	79.1			Cobbles; light brown to grayish brown.
15								
			15	35.1	87.2			Saturated.
20								

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BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-17

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 5/12/98 BORING NO. B-6 GROUND ELEVATION 22.0' (MSL) SHEET 2 OF 2 METHOD OF DRILLING 8" Diameter Hollow-Stem Auger DRIVE WEIGHT 140 lbs. DROP 30" SAMPLED BY RCS LOGGED BY RCS REVIEWED BY RI **DESCRIPTION/INTERPRETATION**
								Total Depth = 20 feet. Groundwater encountered during drilling at 19.5 feet. Backfilled on 5/12/98.
25								
30								
35								
40								

Ninyo & Moore

BORING LOG

EL CAMINO REAL WIDENING
SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
103645-01	6/98	A-18

APPENDIX B

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APPENDIX B

LABORATORY TESTING

Classification
Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the logs of the exploratory excavations in Appendix A.

Moisture Content
The moisture content of samples obtained from the exploratory excavations was evaluated in accordance with ASTM D 2216. The test results are presented on the logs of the exploratory excavations in Appendix A.

In-Place Moisture and Density Tests
The moisture content and dry density of relatively undisturbed samples obtained from the exploratory excavations were evaluated in general accordance with ASTM D 2937. The test results are presented on the logs of the exploratory excavations in Appendix A.

Gradation Analysis
Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422. The grain-size distribution curves are shown on Figures B-1 through B-9. These test results were utilized in evaluating the soil classifications in accordance with the Unified Soil Classification System.

Atterberg Limits
Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the Unified Soil Classification System. The test results and classifications are shown on Figure B-10.

Consolidation Tests
Consolidation tests were performed on selected relatively undisturbed soil samples in general accordance with ASTM D 4546. The samples were inundated during testing to represent adverse field conditions. The percent of consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the tests are summarized on Figures B-11 through B-16.

Direct Shear Tests

Direct shear tests were performed on undisturbed samples in general accordance with ASTM D 3080 to evaluate the shear strength characteristics of selected materials. The samples were inundated during shearing to represent adverse field conditions. The test strain rate was 0.005 inch per minute. The results are shown on Figures B-17 through B-21.

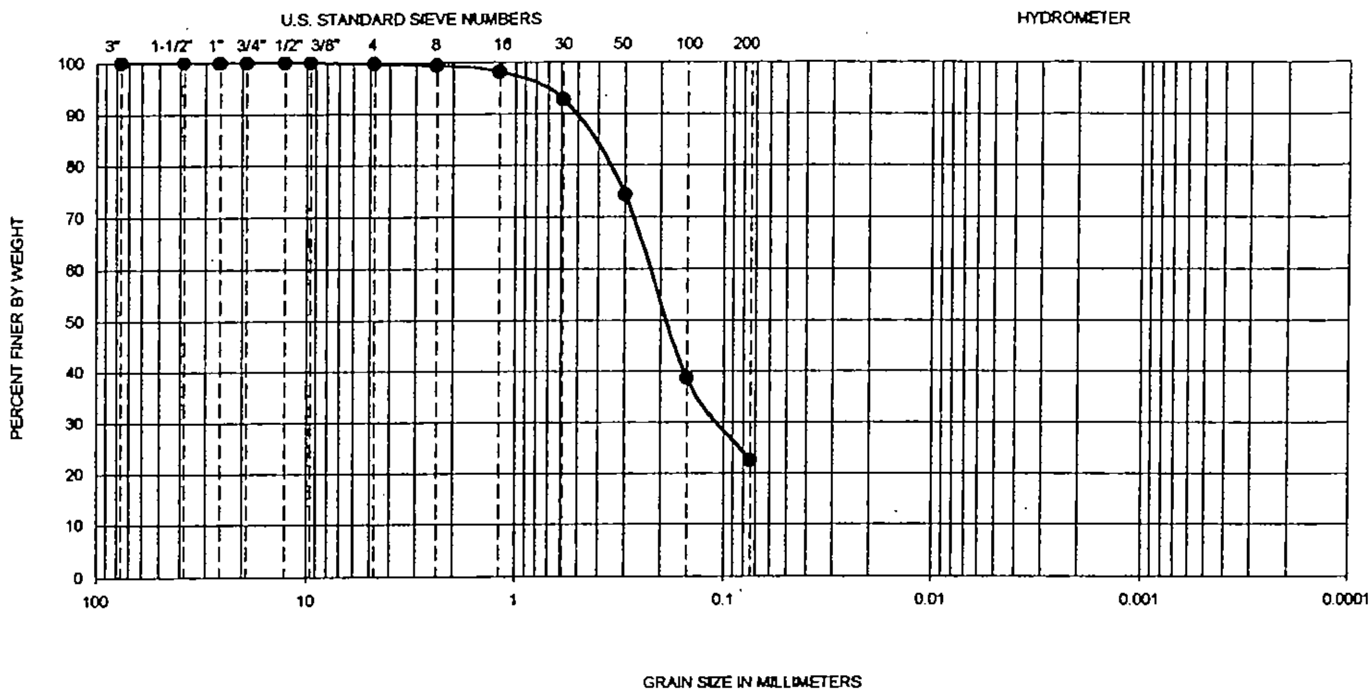
Soil Corrosivity Tests

Soil pH, and minimum resistivity tests were performed on representative samples in general accordance with California Test (CT) 643. The chloride content of selected samples was evaluated in general accordance with CT 422. The sulfate content of selected samples was evaluated in general accordance with CT 417. The test results are presented on Figure B-22.

R-Value

The resistance value, or R-value, for base, subbase, and basement soils was evaluated in general accordance with ASTM D 2844. Samples were prepared and each was tested for exudation pressure and R-value. The graphically evaluated R-value at an exudation pressure of 300 pounds per square inch is reported. The test results are shown on Figure B-23.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-2	18.5-20.0	--	--	--	--	--	--	--	--	22.5	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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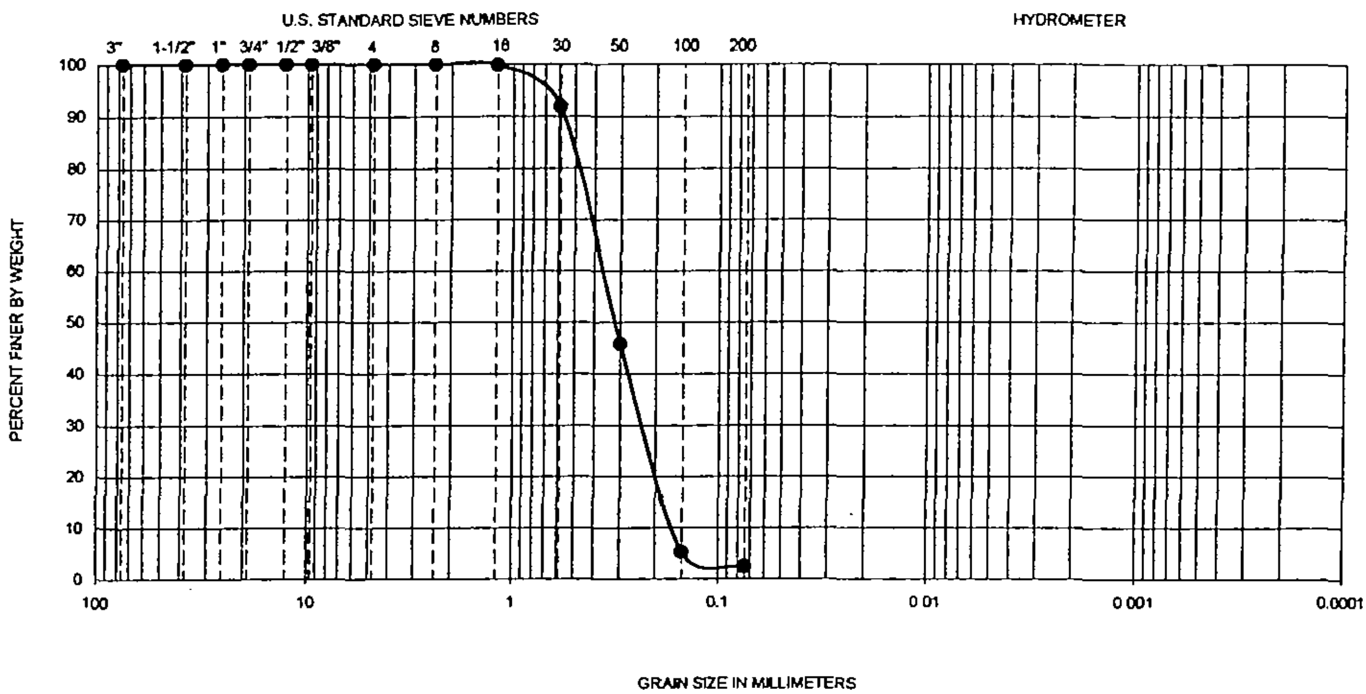
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-1

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-3	15.0-16.5	--	--	--	0.17	0.24	0.38	2.2	0.9	2.4	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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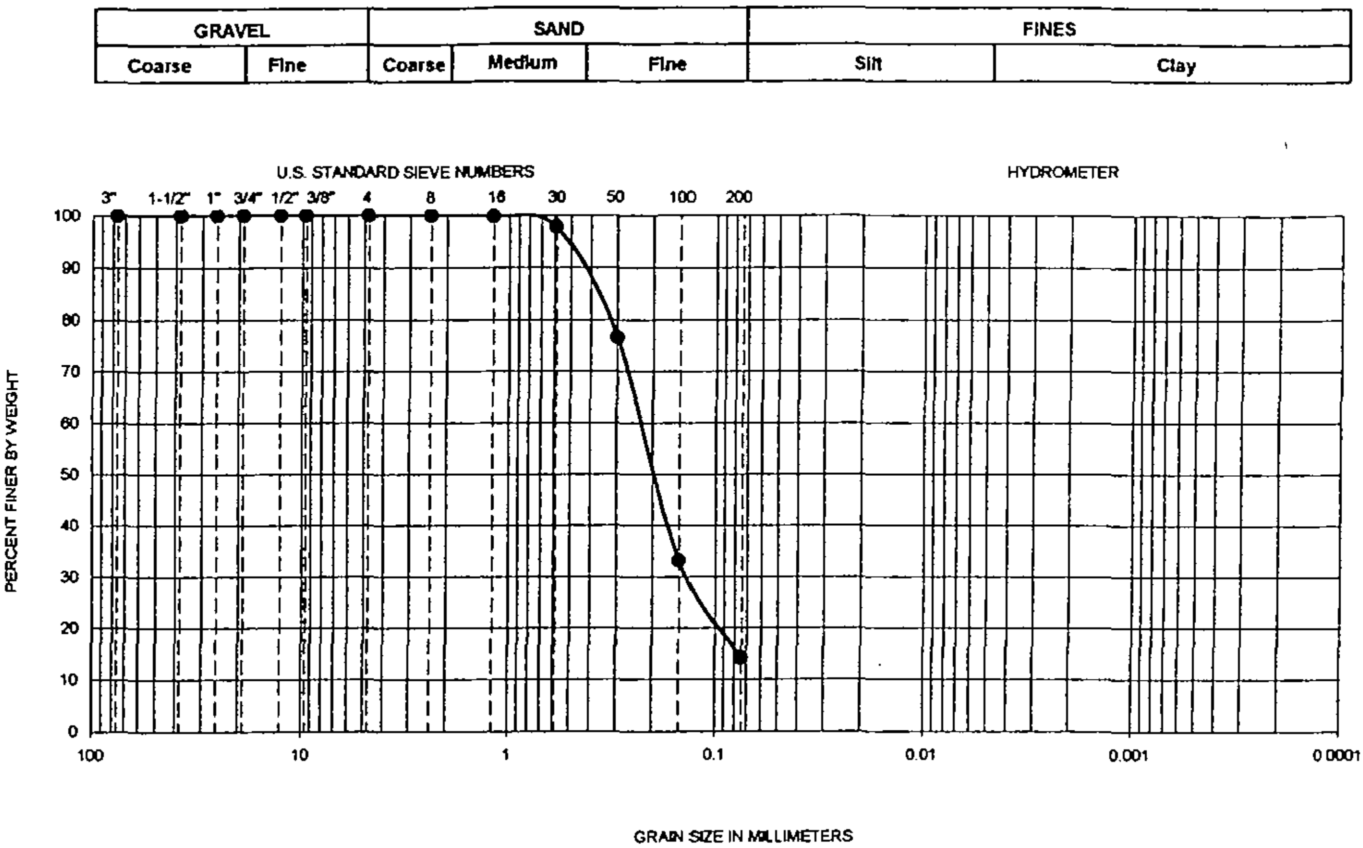
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-2

53645-1



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-3	60.0-61.5	--	--	--	0.06	0.14	0.23	4.0	1.5	14.2	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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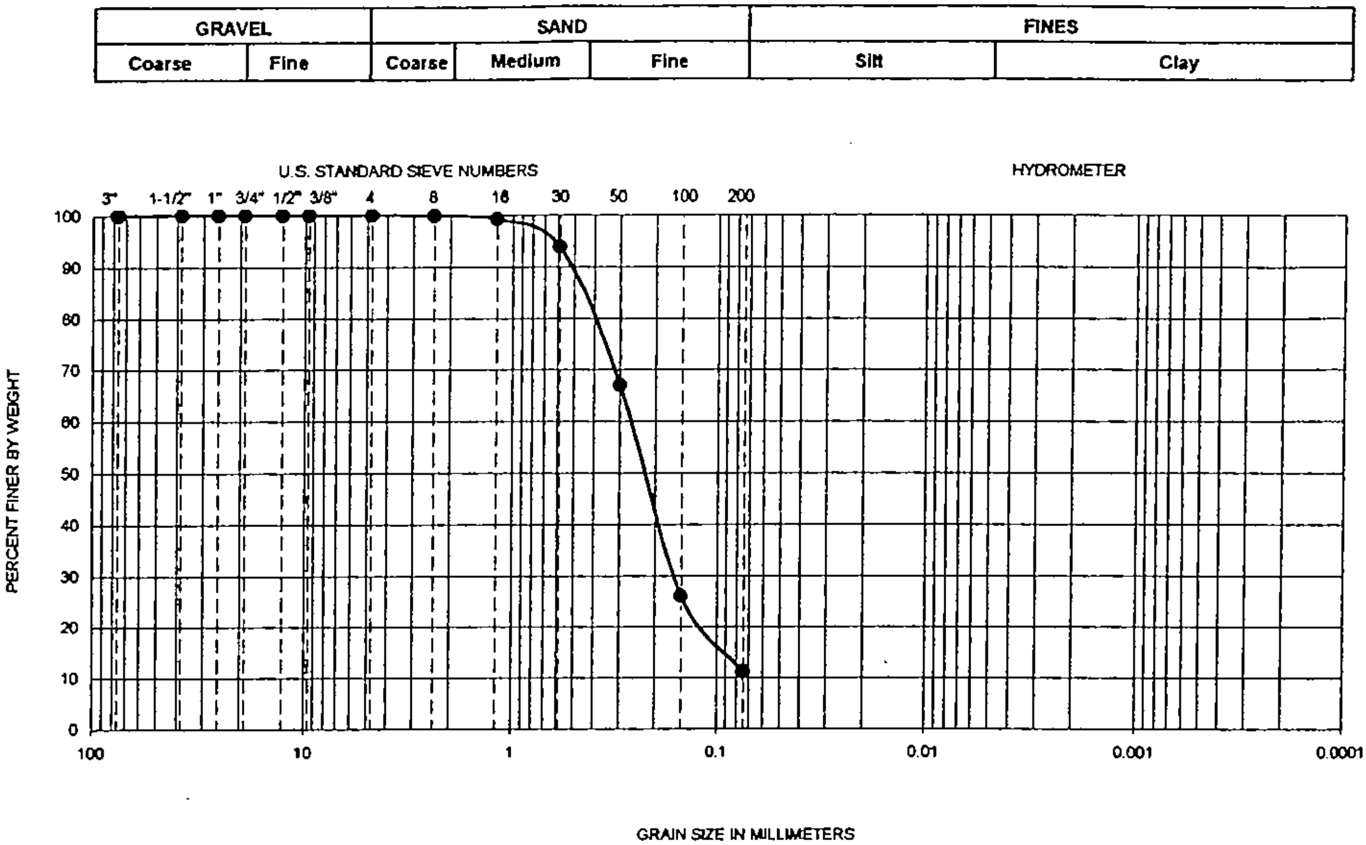
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-3

S3645-2



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-3	80.0-81.5	--	--	--	0.07	0.16	0.27	4.1	1.4	11.1	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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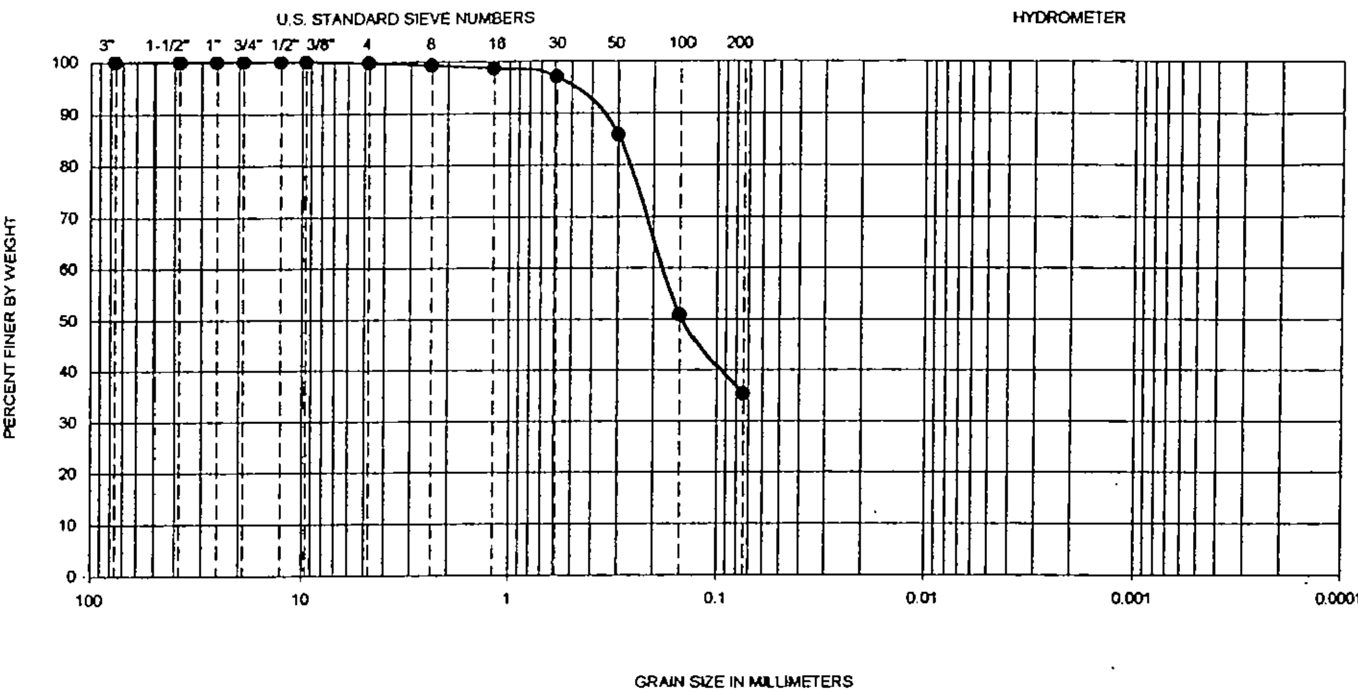
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-4

53645-3

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-4	20.0-21.5	--	--	--	--	--	--	--	--	35.2	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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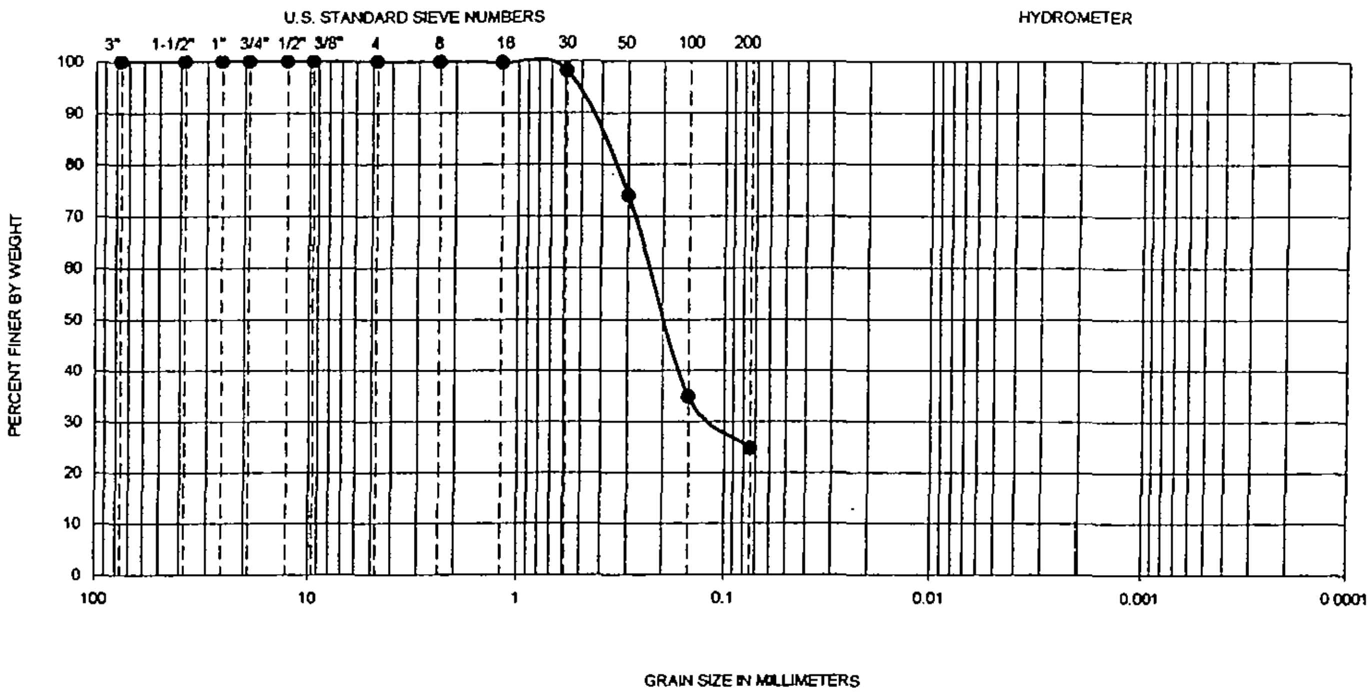
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-5

63645-4

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-4	60.0-61.5	--	--	--	--	--	--	--	--	24.7	SC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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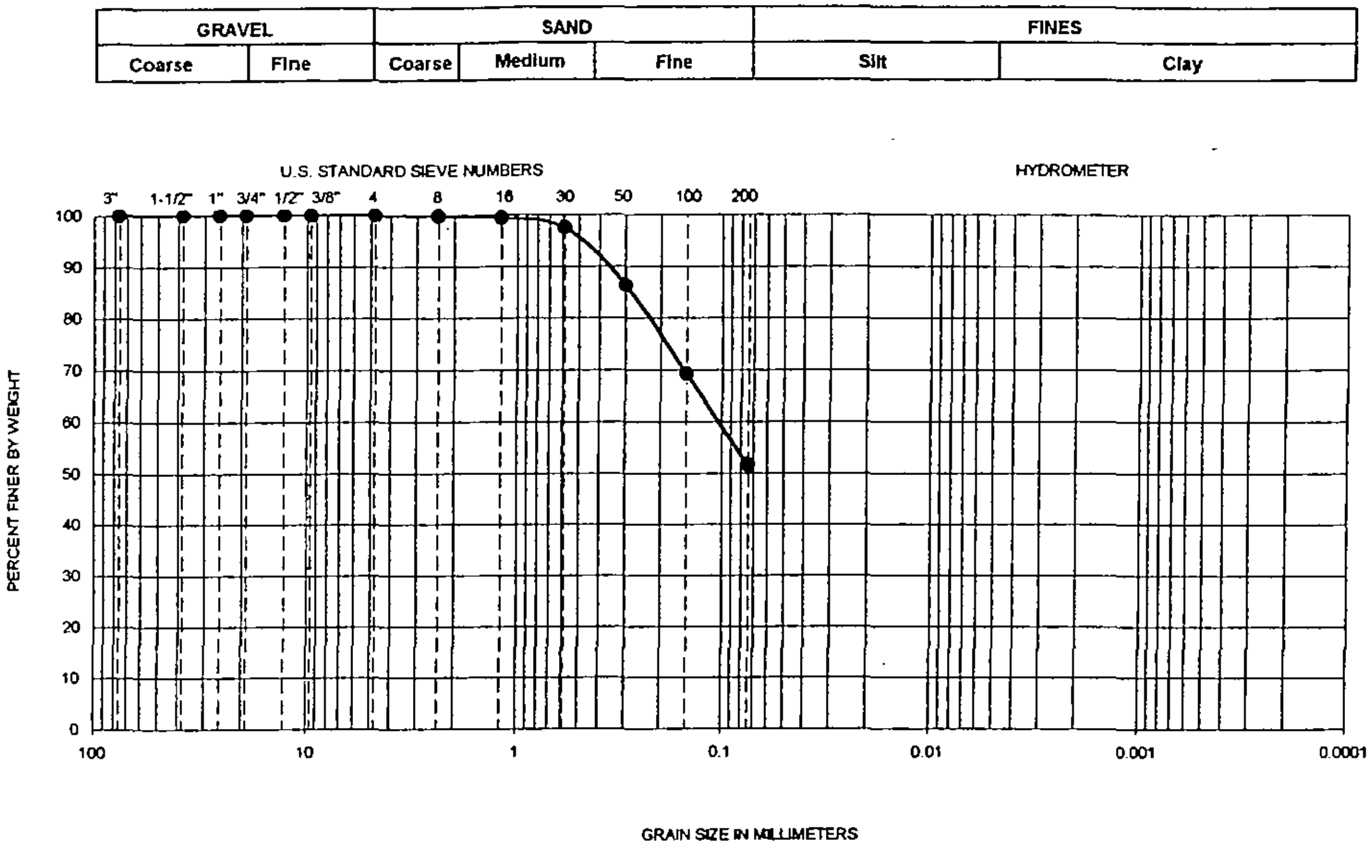
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-6

53645-5



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-4	80.0-81.5	--	--	--	--	--	--	--	--	51.6	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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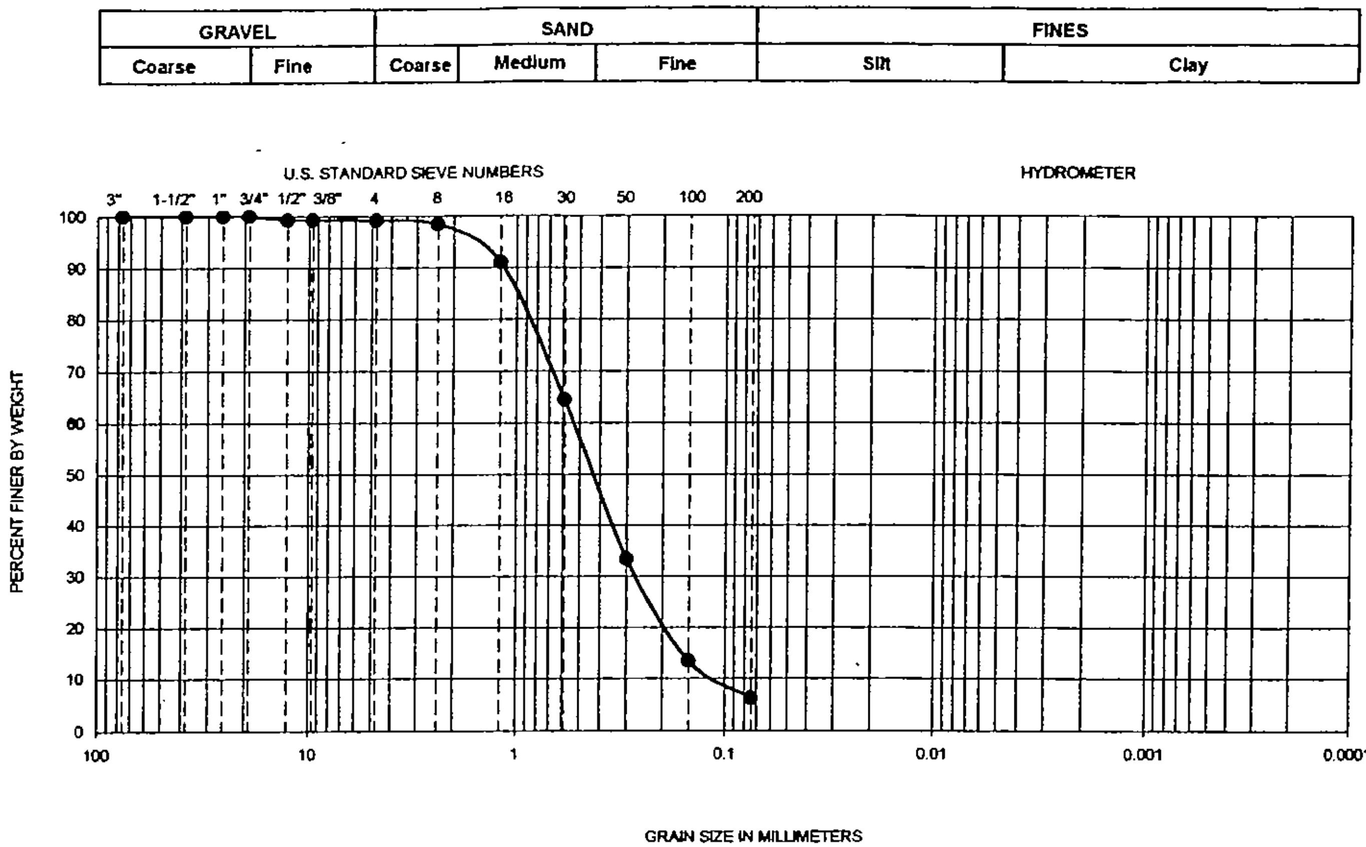
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-7



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-4	90.0-91.5	–	–	–	0.12	0.28	0.54	4.5	1.2	6.1	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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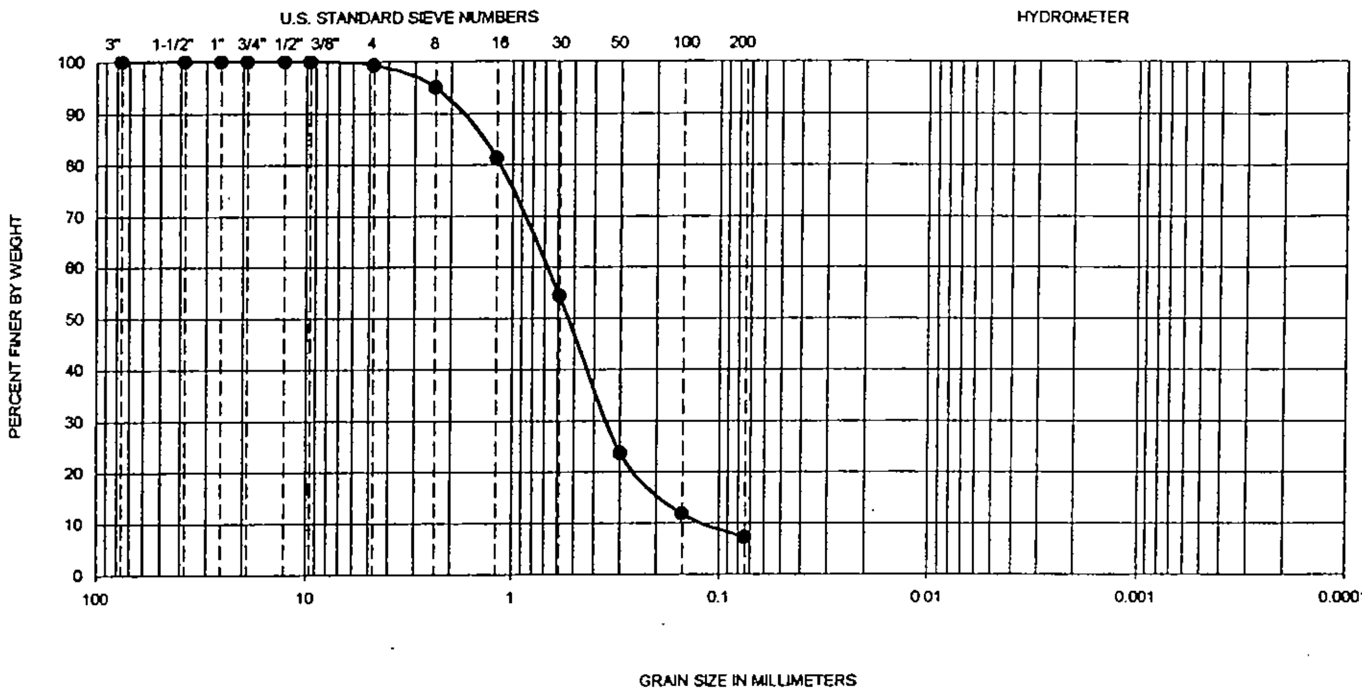
GRADATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-8

53645-7

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-4	95.0-96.5	--	--	--	0.12	0.28	0.68	5.7	1.0	7	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

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GRADATION TEST RESULTS

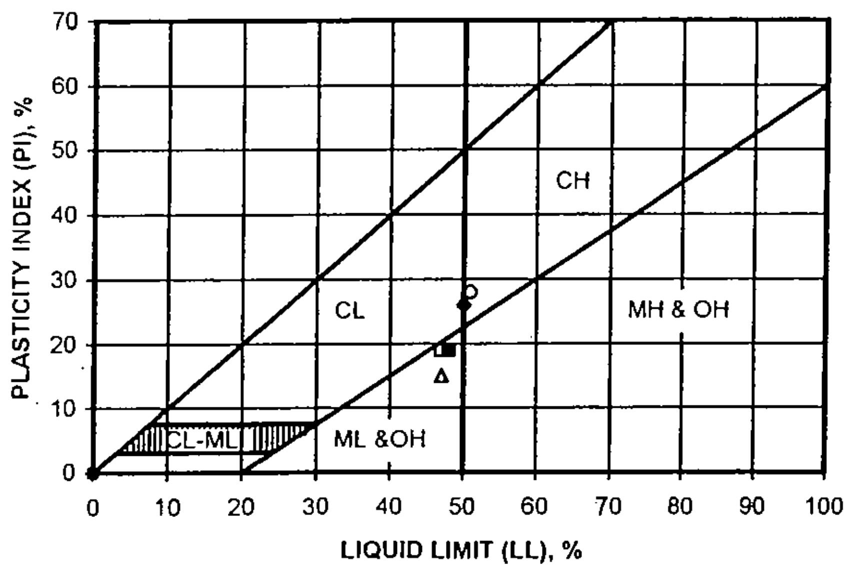
El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-9

53645-8

SYMBOL	LOCATION	DEPTH (FT)	LL (%)	PL (%)	PI (%)	U.S.C.S. CLASSIFICATION (Minus No. 40 Sieve Fraction)	U.S.C.S. (Entire Sample)
●	B-2	10.0-11.5	--	--	--	NP	ML
■	B-3	35.0-36.5	48	29	19	ML	ML
◆	B-3	50.0-51.5	50	24	26	CH	CH
○	B-4	45.0-46.5	51	23	28	CH	CH
□	B-5	15.0-16.5	47	28	19	ML	ML
Δ	B-6	10.0-11.5	47	32	15	ML	ML

NP - Indicates non-plastic



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318-93

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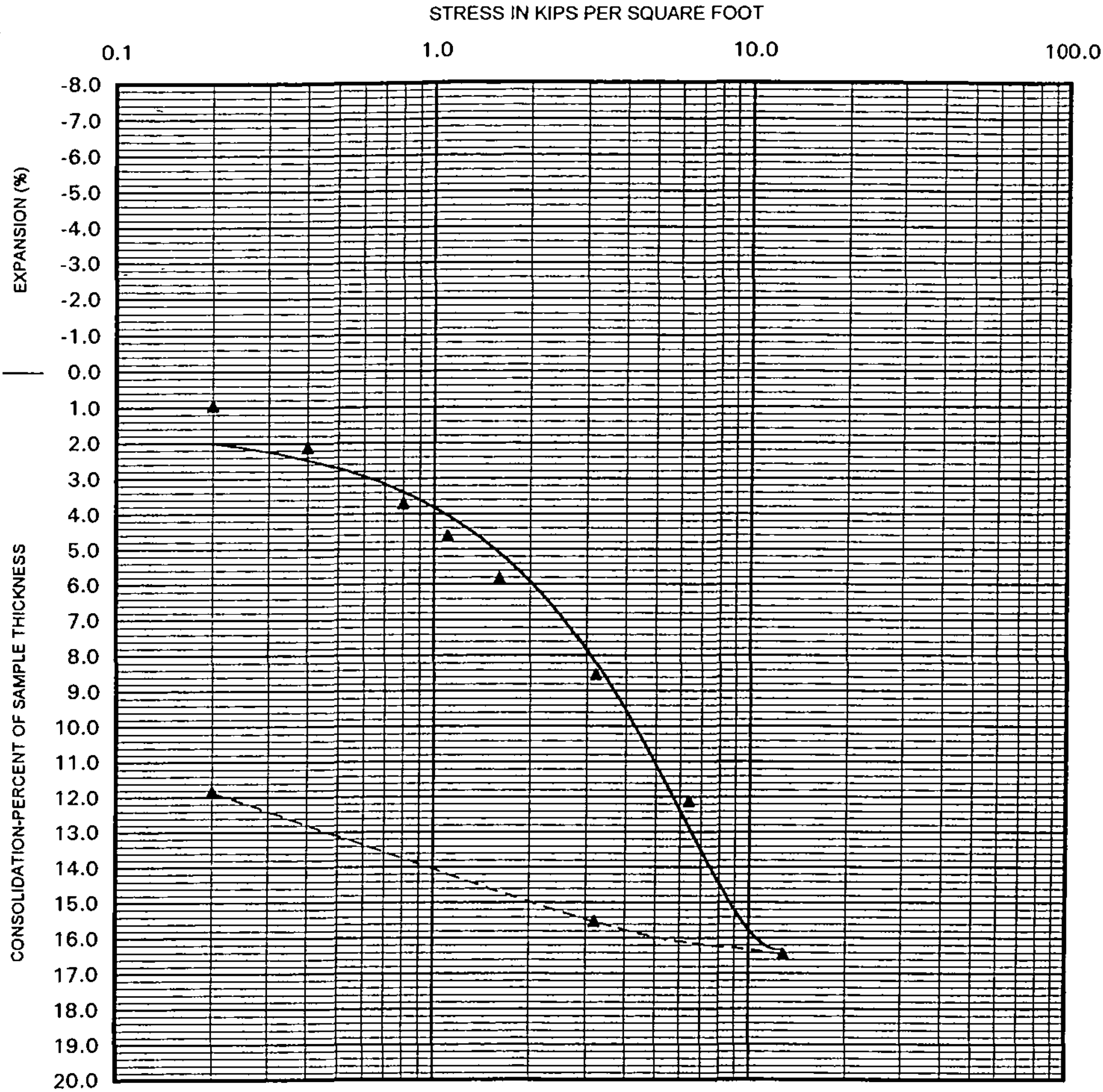
ATTERBERG LIMITS TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-10



- - ◆ - - Seating Cycle
● Loading Prior to Inundation
▲ Loading After Inundation

Boring No. B-1
Depth (ft.) 10-11.5
Soil Type ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435-90

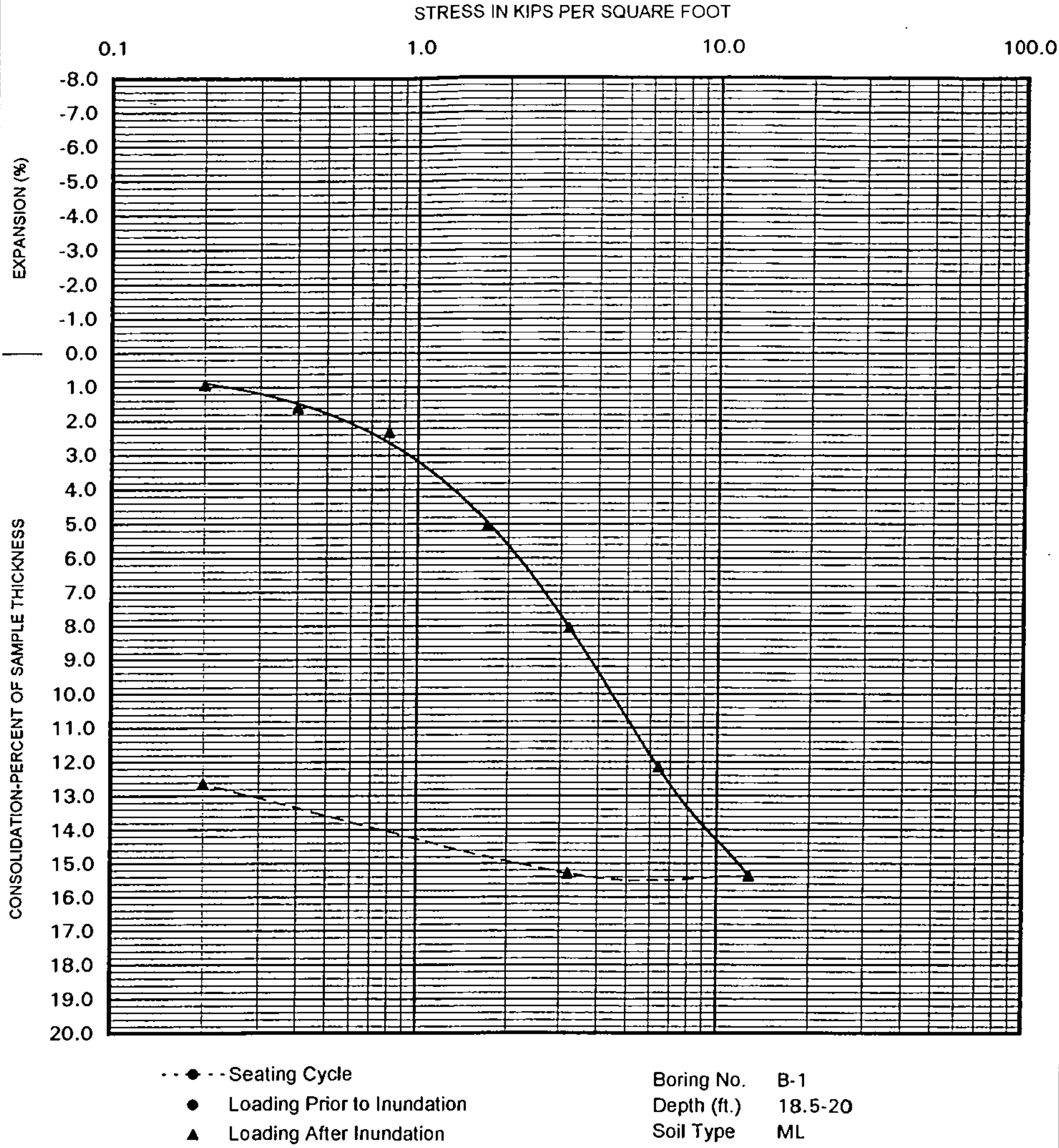
Ninyo & Moore

CON3645-0

CONSOLIDATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-11



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435-90

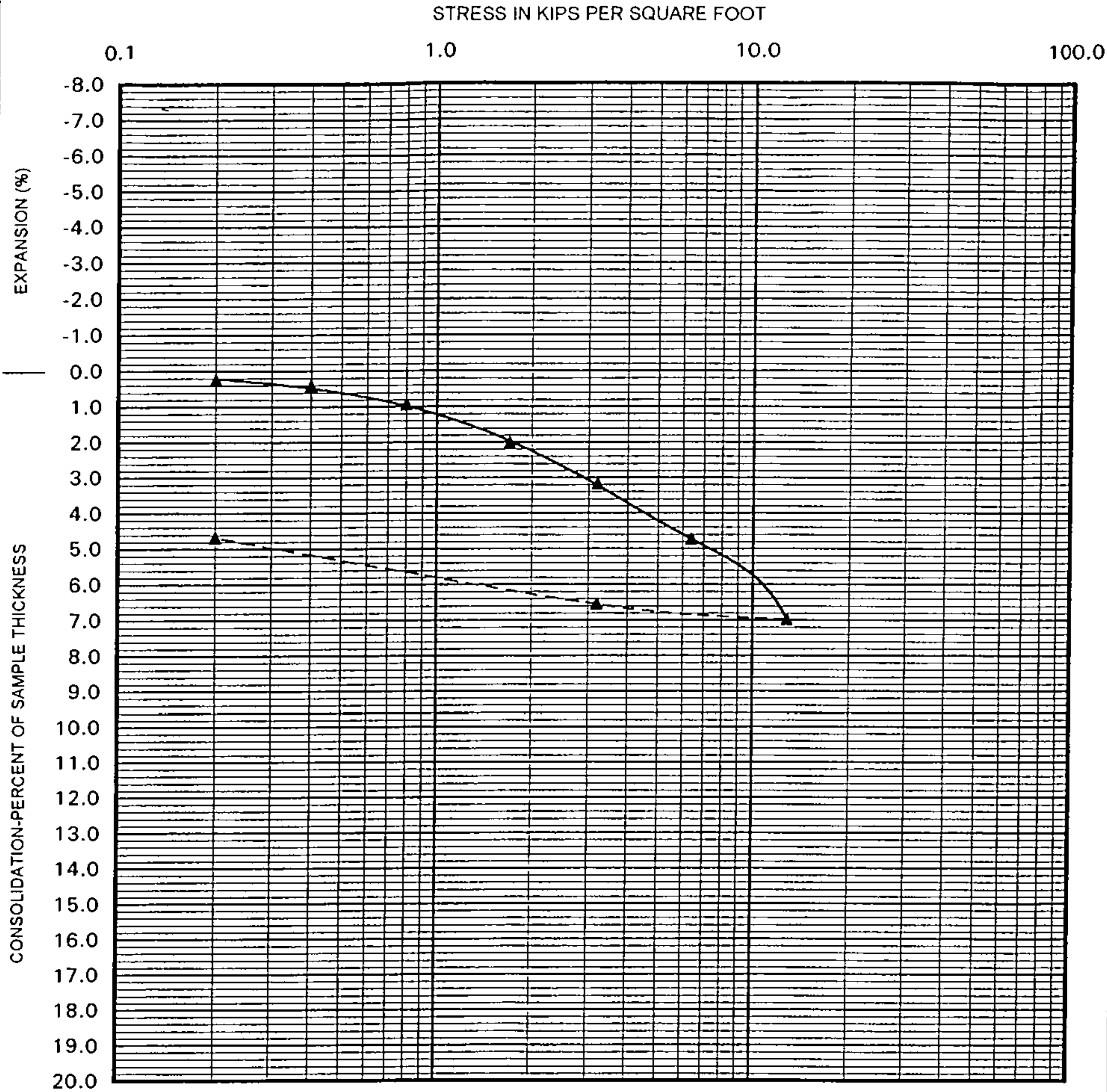
Ninyo & Moore

CON3645-1

CONSOLIDATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-12



- - ● - - Seating Cycle

● Loading Prior to Inundation

▲ Loading After Inundation

Boring No. B-2

Depth (ft.) 5-6.5

Soil Type ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435-90

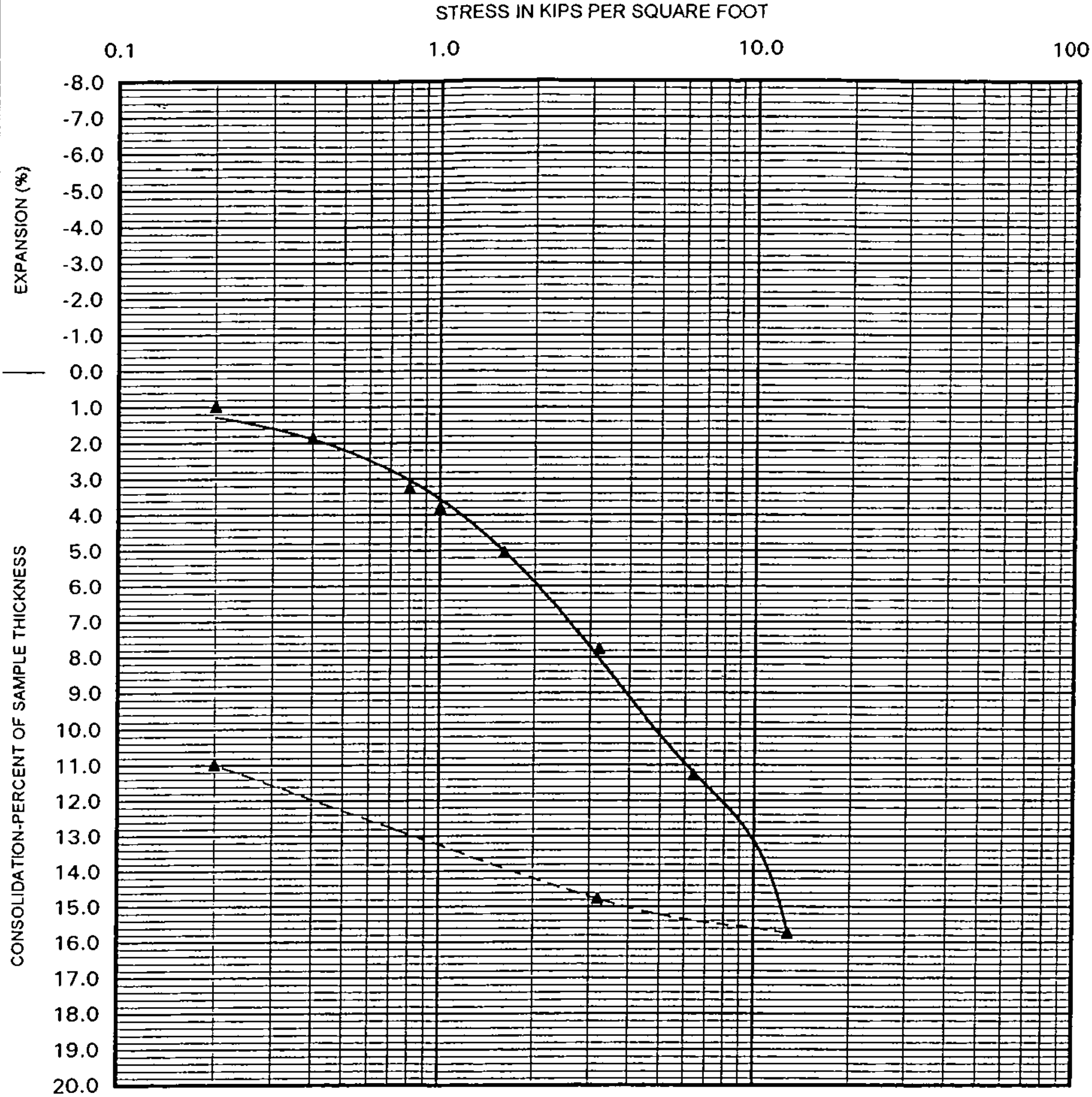
Ninyo & Moore

CON3645-2

CONSOLIDATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-13



- - ◆ - - Seating Cycle
● Loading Prior to Inundation
▲ Loading After Inundation

Boring No.	B-2
Depth (ft.)	10-11.5
Soil Type	ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435-90

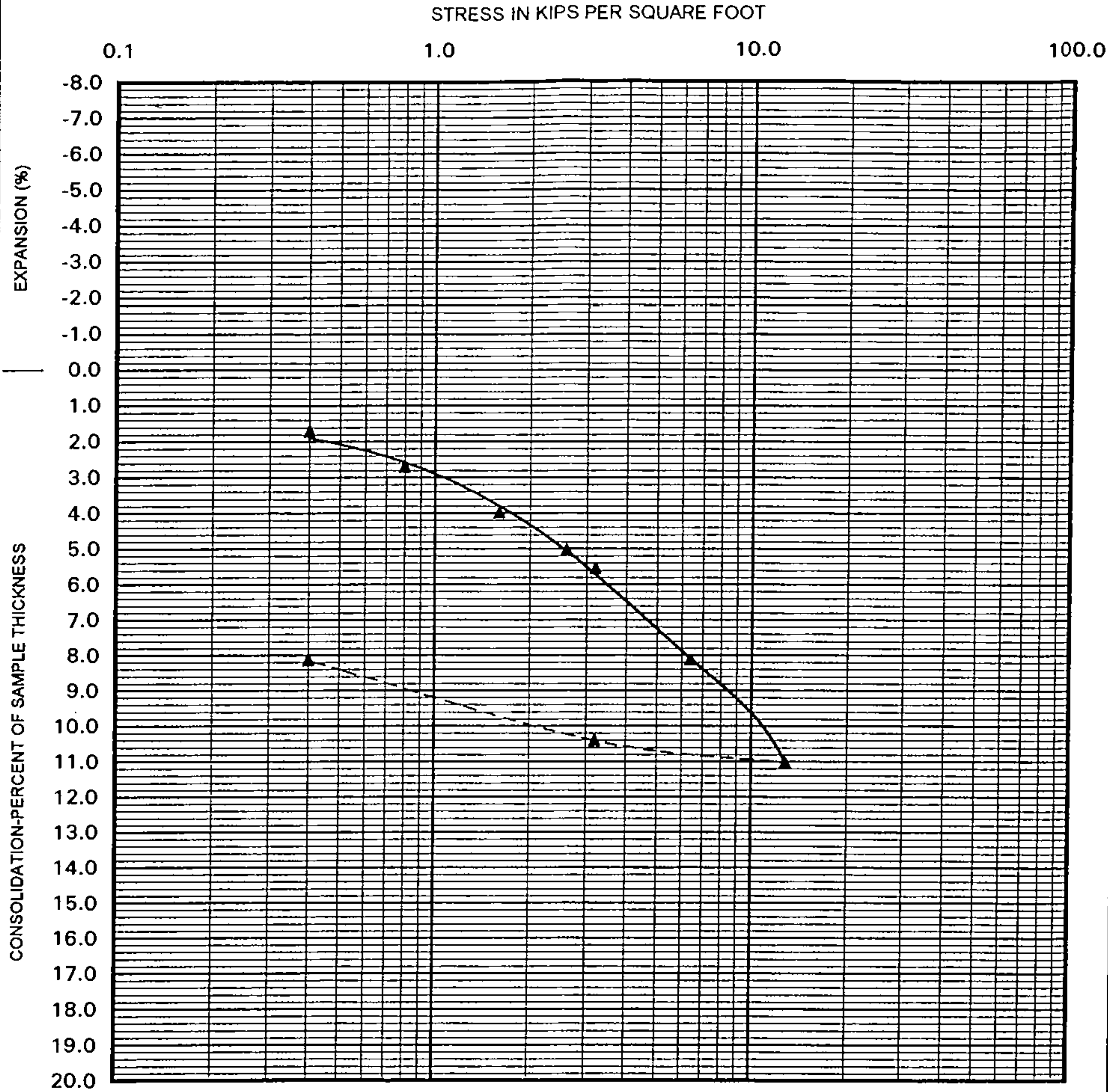
Ninyo & Moore

CON3645-3

CONSOLIDATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-14



Seating Cycle
Loading Prior to Inundation
Loading After Inundation

Boring No. B-4
Depth (ft.) 30-31.5
Soil Type ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435-90

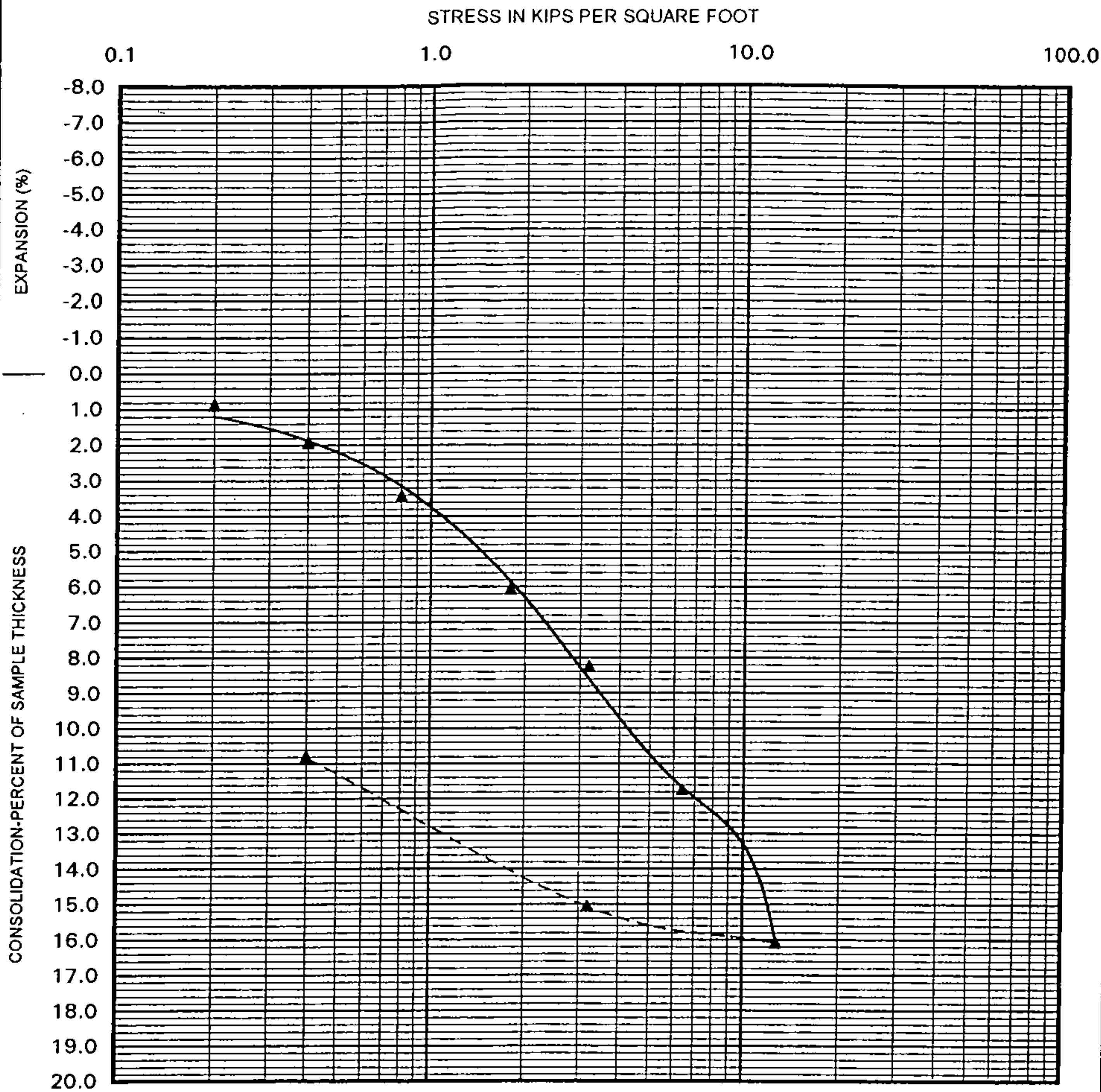
Ninyo & Moore

CON3645-4

CONSOLIDATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-15



· · ◆ · · Seating Cycle
● Loading Prior to Inundation
▲ Loading After Inundation

Boring No. 8-5
Depth (ft.) 15-16.5
Soil Type ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435-90

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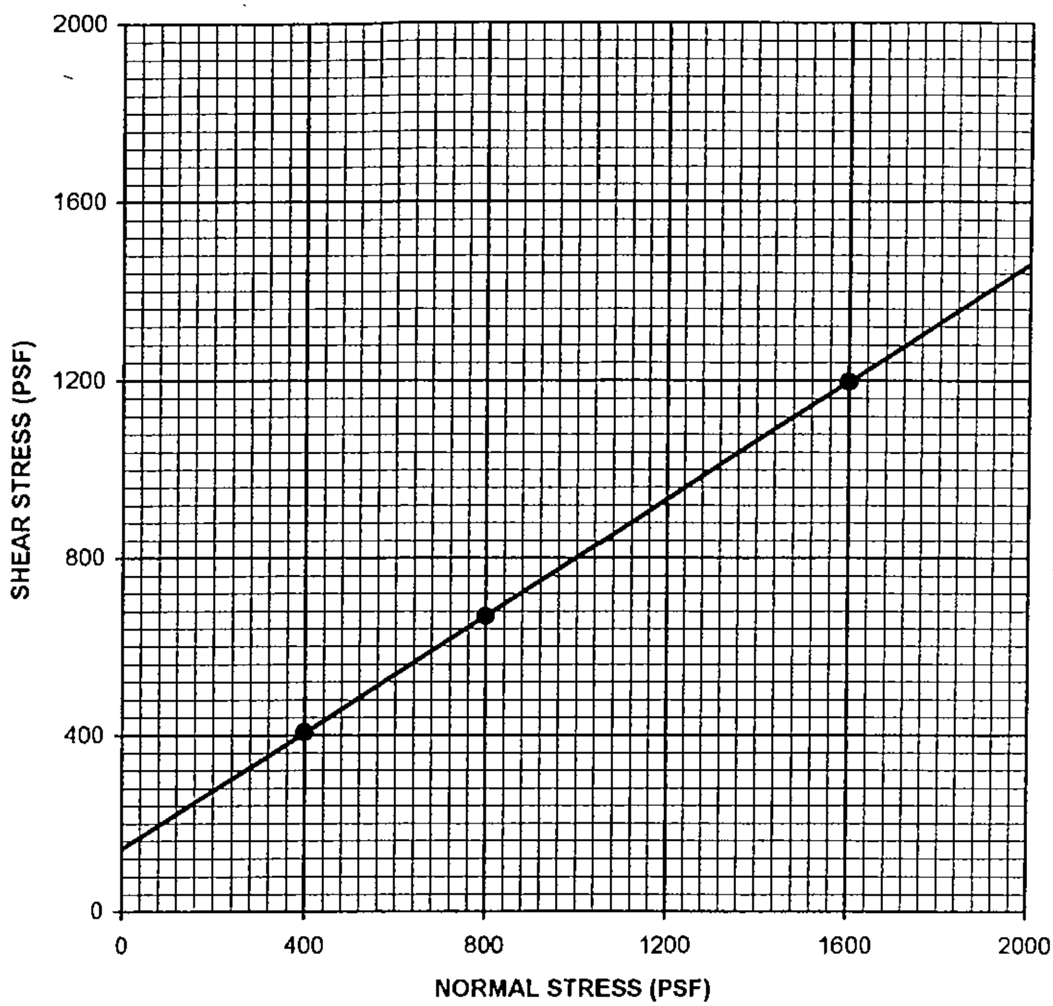
CON3645-5

CONSOLIDATION TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-16



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Silty Sand	●	B-2	2-3.5	Peak	140	33	ML

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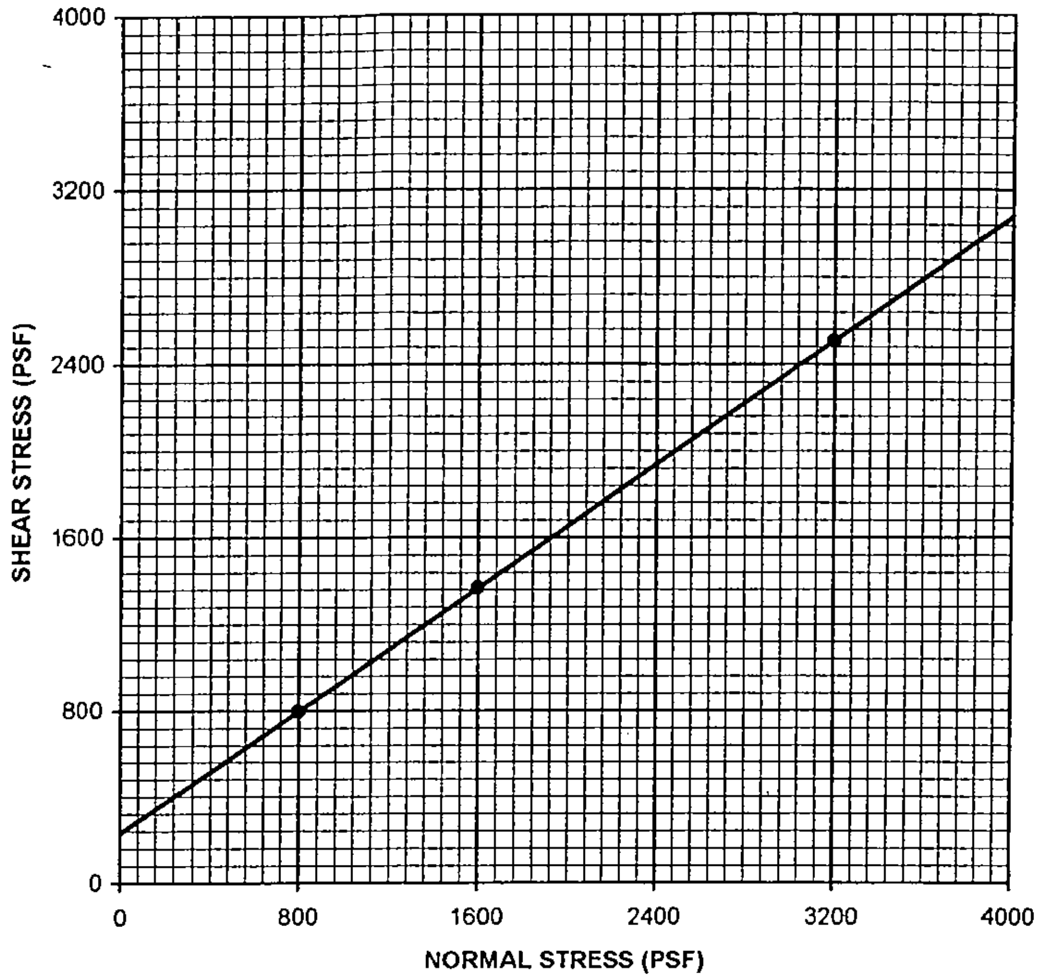
DIRECT SHEAR TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-17



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Silty Sand	●	B-3	10-11.5	Peak	240	35	SM

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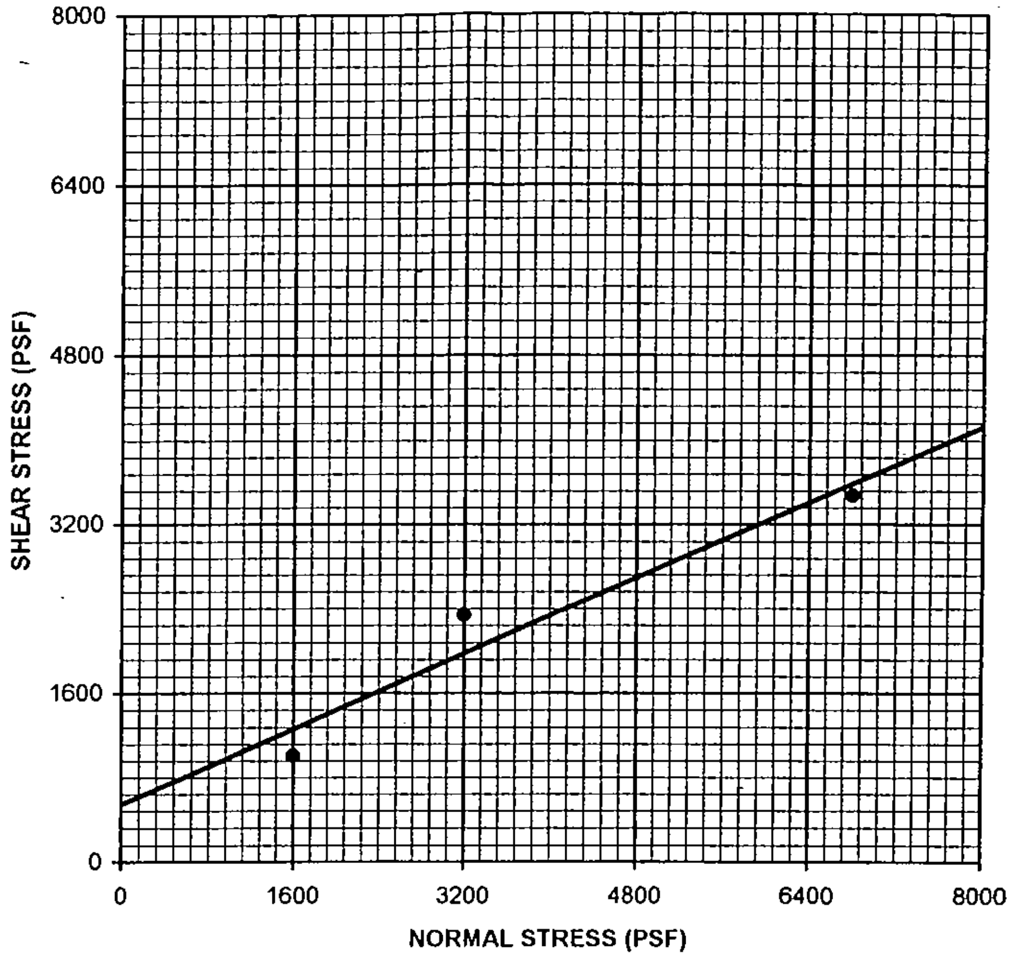
DIRECT SHEAR TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-18



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Sandy Silt	●	B-3	30-31.5	Peak	550	25	ML

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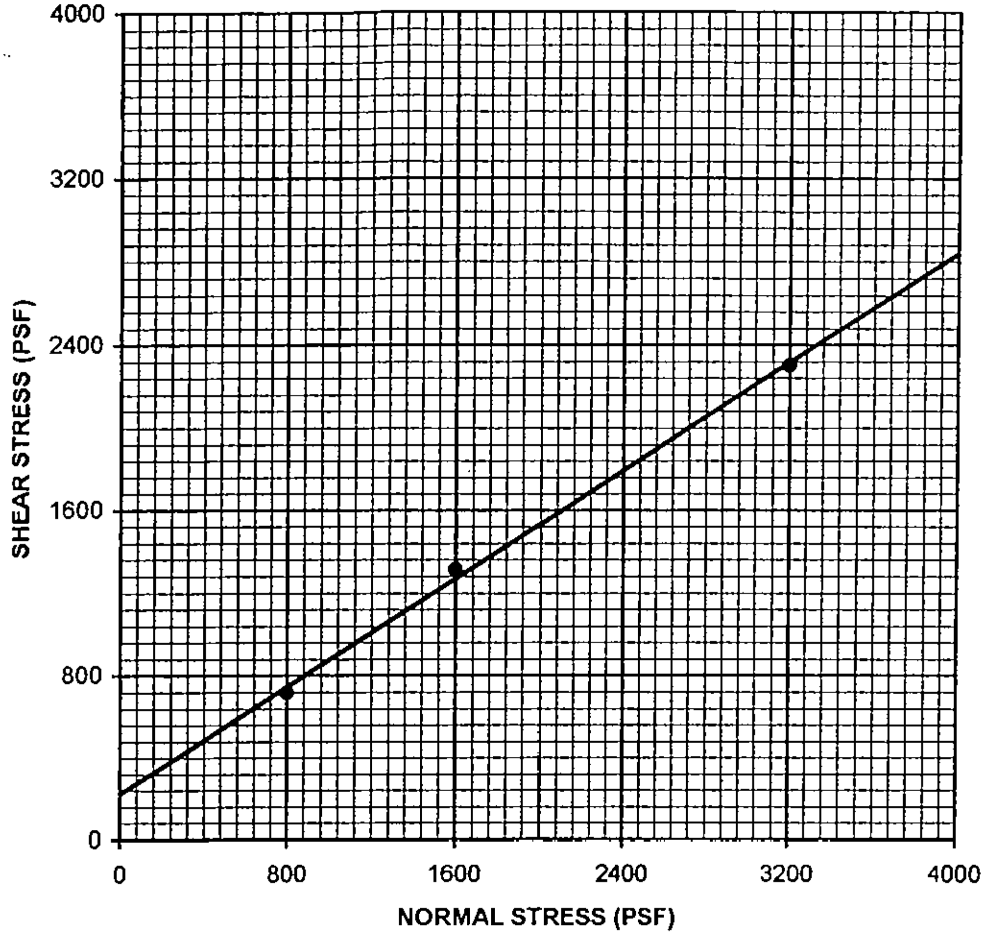
DIRECT SHEAR TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-19



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Silty Sand	●	B-4	10-11.5	Peak	230	33	SM

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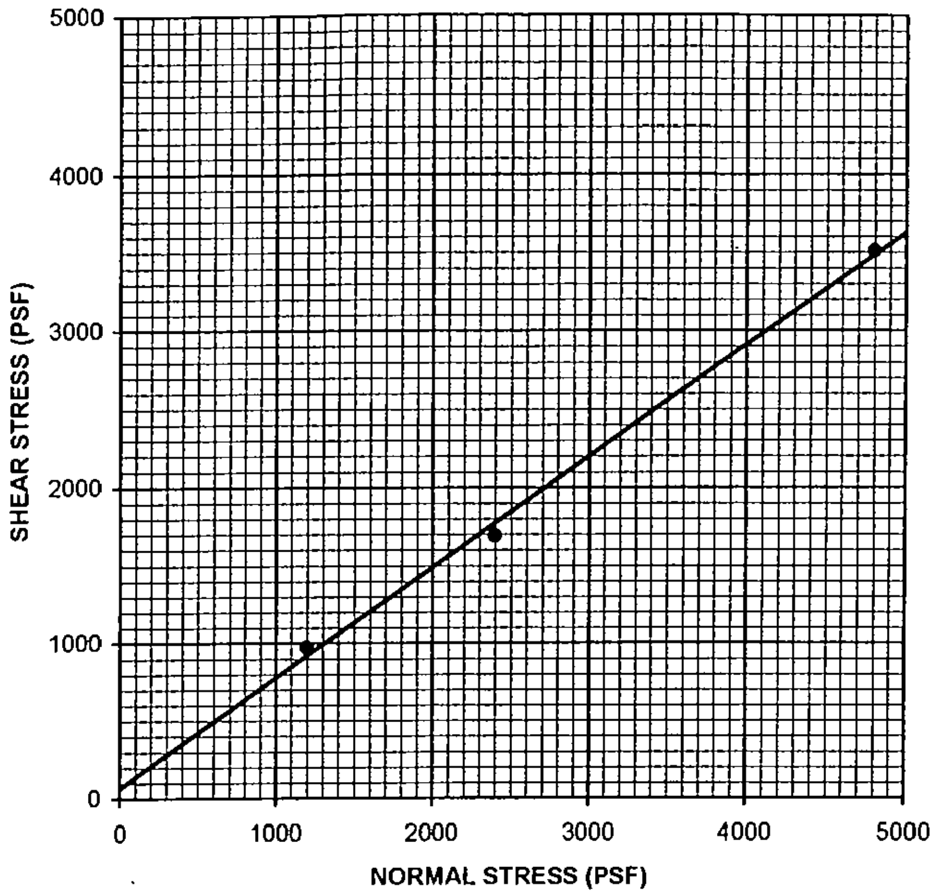
DIRECT SHEAR TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-20



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Silty Sand	●	B-4	20-21.5	Peak	80	35	SM

Ninyo & Moore

DIRECT SHEAR TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-21

CORROSIVITY TEST RESULTS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	pH *	RESISTIVITY * (ohm-cm)	WATER-SOLUBLE SULFATE CONTENT IN SOIL ** (percent)	CHLORIDE CONTENT *** (ppm)
B-1	0.0 - 5.0	7.7	300	0.124	1,000
B-2	0.0 - 5.0	7.8	470	0.030	640
B-3	0.0 - 5.0	7.0	680	0.040	135
B-4	0.0 - 5.0	7.3	7,500	0.003	20
B-5	0.0 - 5.0	6.8	545	0.033	85
B-6	0.0 - 5.0	6.9	480	0.042	345

* PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643

** PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417

*** PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

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CORROSIVITY TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-22

R-VALUE TEST RESULTS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	SOIL TYPE	R-VALUE
B-2	0 - 5	SM	44
B-6	0 - 5	SC	13

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2844-00

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R-VALUE TEST RESULTS

El Camino Real Widening
San Diego, California

PROJECT NO.	DATE	FIGURE
103645-01	8/98	B-23

RVTABLE2

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APPENDIX C

CONE PENETROMETER TESTING

Cone Penetrometer Testing

Cone penetrometer test (CPT) soundings were performed with a truck-mounted CPT rig hydraulically pushing a 10-ton electronic penetrometer. The CPT soundings were performed in general accordance with ASTM Test Method D3441. The cone tip has a 60-degree point angle and a base diameter of approximately 1.4 inches, resulting in a projected area of 1.55 square inches. The friction sleeve has approximately the same diameter as the cone, and a surface area of 23.2 square inches. Measured end-bearing stress, q_c, and friction-sleeve stress, f_s, were digitally recorded at 5-centimeter intervals and plotted on a plot including the friction ratio, R_f, which is defined as the ratio of f_s divided by q_c. CPT data is normalized for overburden by calculating as follows:

Normalized cone resistance,

$$Q_c = \frac{q_c - \sigma_{vo}}{\sigma_{v'o}}$$

and normalized friction ratio,

$$F_r = \frac{f_s}{q_c - \sigma_{vo}} * 100\%$$

where σ_{vo} and $\sigma_{v'o}$ are the total and effective overburden stress values, respectively.

Tabulations of CPT data also include estimates of relative density, and friction angle and equivalent SPT blow count values, based on correlations developed by Robertson and Campanella (1986). The approximate CPT locations are shown on Figure 2. The plots and tabulation of the CPT test results are included in this Appendix.

PRESENTATION OF CONE PENETRATION TEST DATA

EL CAMINO REAL BRIDGE

DEL MAR, CALIFORNIA

Prepared for:

NINYO & MOORE
San Diego, California

Prepared by:

GREGG IN SITU, INC.
Signal Hill, California

Prepared on:

July 20, 1998

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PRESENTATION OF CONE PENETRATION TEST DATA

1.0 INTRODUCTION

This report presents the results of a Cone Penetration Testing (CPT) program carried out at the El Camino Real Bridge site located in Del Mar, CA. The work was performed on July 15, 1998. The scope of work was performed as directed by NINYO & MOORE personnel.

2.0 FIELD EQUIPMENT & PROCEDURES

The Cone Penetration Tests (CPT) were carried out by GREGG IN SITU, INC. of Signal Hill, CA using an integrated electronic cone system. The CPT soundings were performed in accordance with ASTM standards (D3441). A 10 ton capacity cone was used for all of the soundings. This cone has a tip area of 10 sq.cm. and friction sleeve area of 150 sq.cm. The cone is designed with an equal end area friction sleeve and a tip end area ratio of 0.85.

The cones used during the program recorded the following parameters at 5 cm depth intervals:

- Tip Resistance (Qc)
- Sleeve Friction (Fs)
- Dynamic Pore Pressure (Ut)

The above parameters were printed simultaneously on a printer and stored on a computer diskette for future analysis and reference.

The pore water pressure element was located directly behind the cone tip. The pore water pressure element was 5.0 mm thick and consisted of porous plastic. Each of the elements were saturated in glycerin under vacuum pressure prior to penetration. Pore pressure dissipations were recorded at 5 second intervals when appropriate during pauses in the penetration.

A complete set of baseline readings was taken prior to each sounding to determine temperature shifts and any zero load offsets. Monitoring base line readings ensures that the cone electronics are operating properly.

The cones were pushed using GREGG IN SITU's CPT rig, having a down pressure capacity of approximately 25 tons. Two CPT soundings were performed. The penetration tests were carried to depths of approximately 105 to 110 feet below ground surface. Test locations and depths were determined in the field by NINYO & MOORE personnel.

3.0 CONE PENETRATION TEST DATA & INTERPRETATION

The cone penetration test data is presented in graphical form in the attached Appendix. Penetration depths are referenced to existing ground surface. This data includes CPT logs of measured soil parameters and a computer tabulation of interpreted soil types along with additional geotechnical parameters and pore pressure dissipation data.

The stratigraphic interpretation is based on relationships between cone bearing (Qc), sleeve friction (Fs), and penetration pore pressure (Ut). The friction ratio (Rf), which is sleeve friction divided by cone bearing, is a calculated parameter which is used to infer soil behavior type. Generally, cohesive soils (clays) have high friction ratios, low cone bearing and generate large excess pore water pressures. Cohesionless soils (sands) have lower friction ratios, high cone bearing and generate little in the way of excess pore water pressures.

The interpretation of soils encountered on this project was carried out using recent correlations developed by Robertson et al, 1988. It should be noted that it is not always possible to clearly identify a soil type based on Qc, Fs and Ut. In these situations, experience and judgement and an assessment of the pore pressure dissipation data should be used to infer the soil behavior type. The soil classification chart used to interpret soil types based on Qc and Rf is provided in the Appendix.

Interpreted output requires that depth of water be entered for calculation purposes, where depth to water is unknown. A depth greater than the sounding termination depth is entered. An arbitrary depth equal to the depth of the sounding plus 10 feet is entered as the groundwater depth.

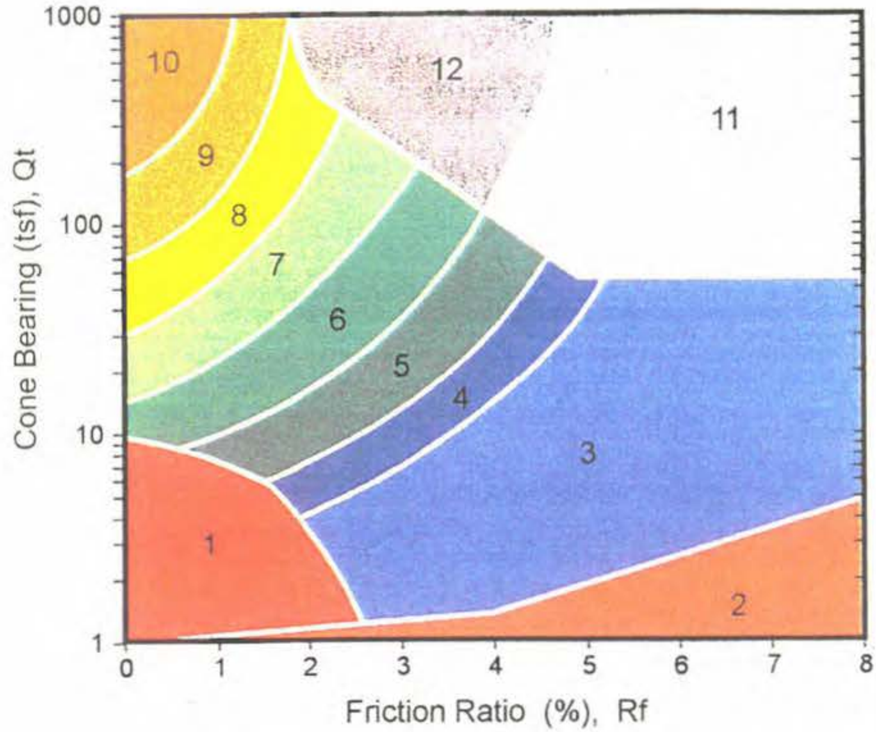
We hope the information presented is sufficient for your purposes. If you have any questions, please do not hesitate to contact our office at (562) 427-6899.

Sincerely,
GREGG IN SITU, INC.

Brian Savela
Operations Manager

APPENDIX

CPT Classification Chart
(after Robertson and Campanella, 1988)



Zone	Q_t / N	Soil Behaviour Type
1	2	sensitive fine grained
2	1	organic material
3	1	clay
4	1.5	silty clay to clay
5	2	clayey silt to silty clay
6	2.5	sandy silt to clayey silt
7	3	silty sand to sandy silt
8	4	sand to silty sand
9	5	sand
10	6	gravelly sand to sand
11	1	very stiff fine grained *
12	2	sand to clayey sand *

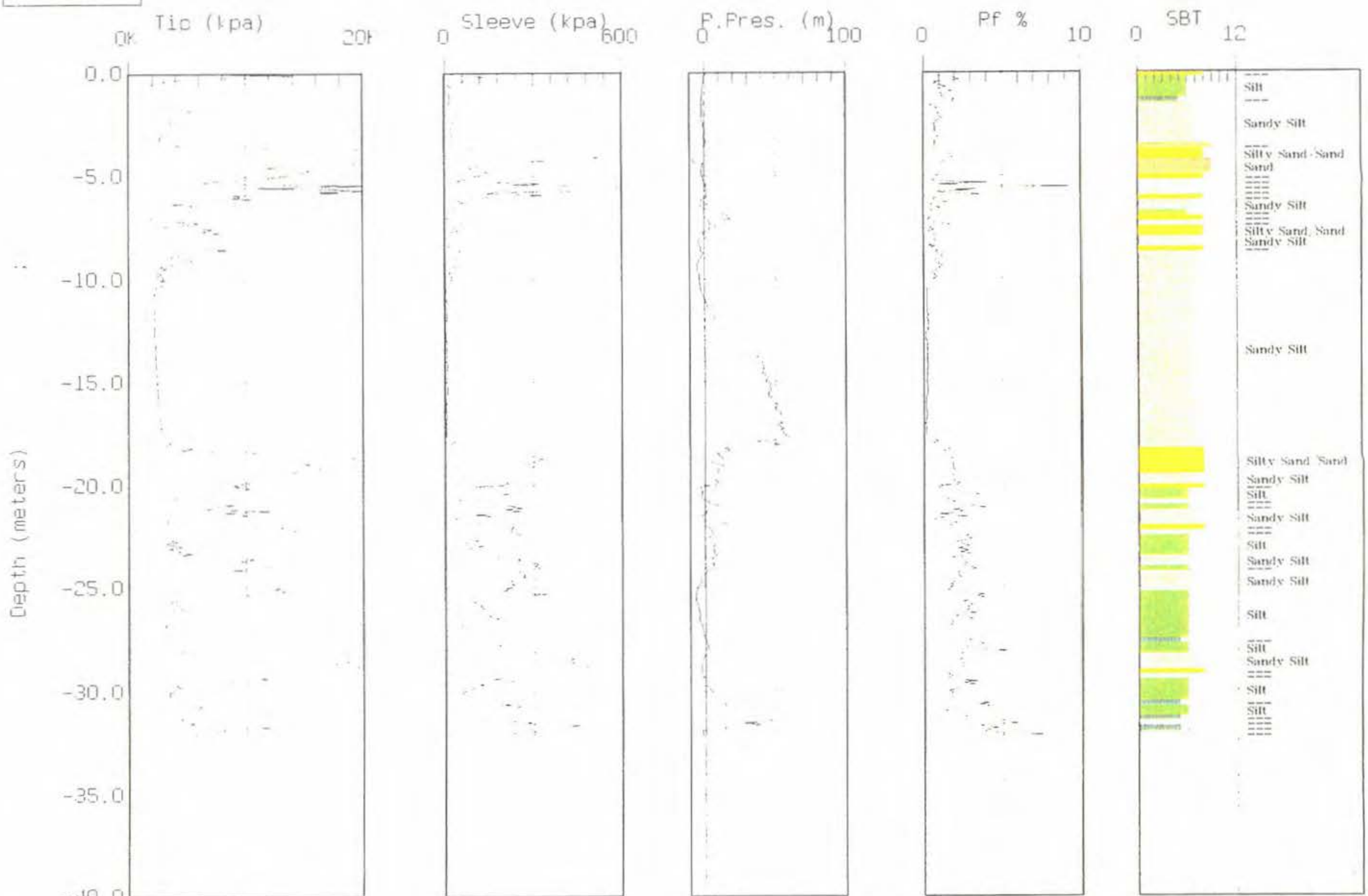
* overconsolidated or cemented

GREGG

Gregg In Situ, Inc.

GREGG

NINYO & MOORE

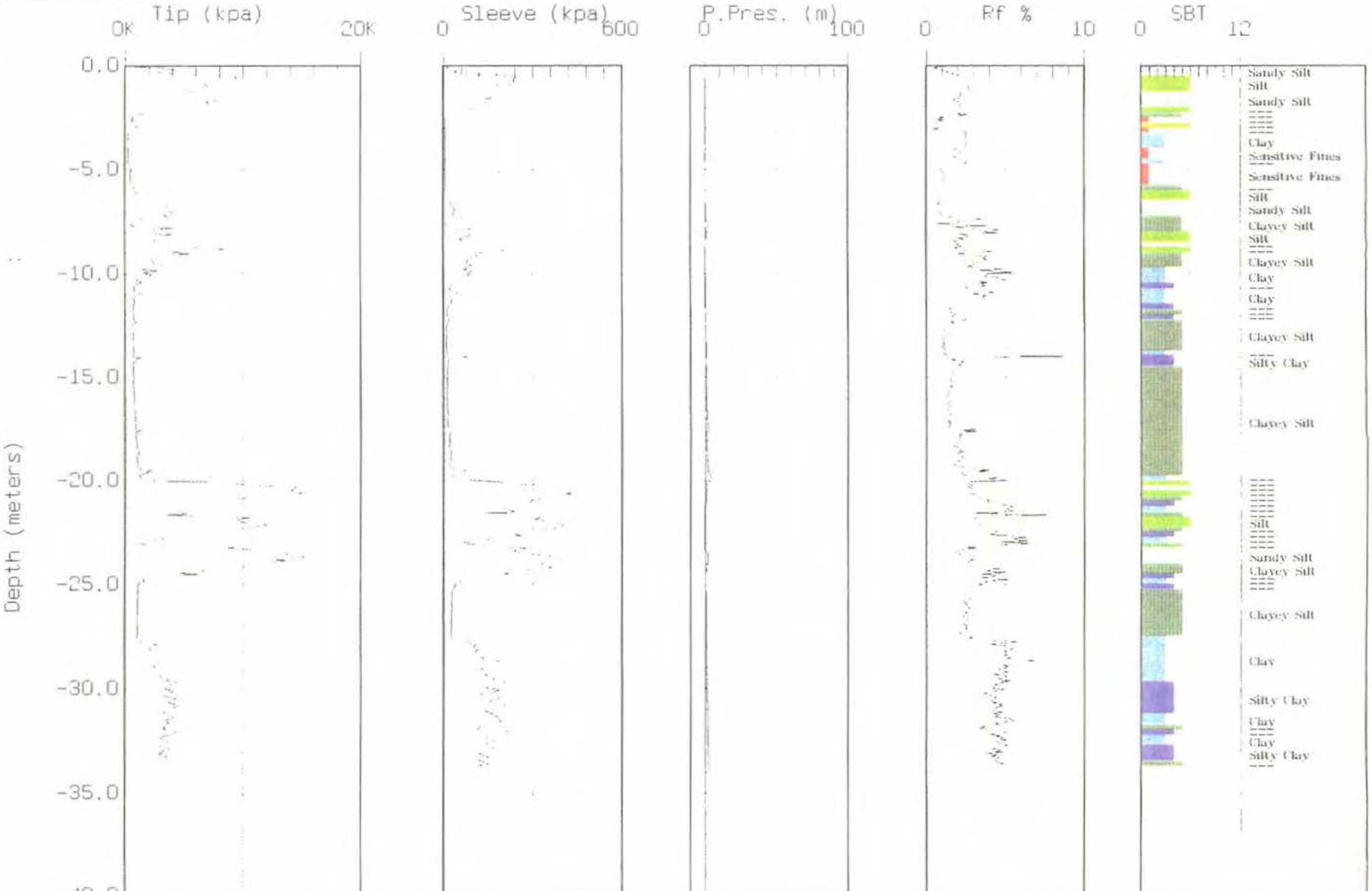


Max. Depth: 32.25 (m)

Depth Inc: 0.05 (m)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

NINYO & MOORE



Max. Depth: 33.75 (m)

Depth Inc.: 0.05 (m)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.17
Run No: 98-0720-1458-2827
Job No: 98-124
Client: NINYO & MOORE
Project: DEL MAR CA.
Site: GE
Location: CPT-1
Cone: ERIK OLSEN
CPT Date: 98/15/07
CPT Time: 09:35
CPT File: 124C01.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.05 (ft): 10.0
Su Nkt used: 12.50
Averaging Increment (m): 0.0 (Every Data Point)
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60	(N1)60 (blows/ft)	Su (tsf)	CRR
0.16	91.7	0.16	0.17	1.3	9	124.1	0.01	0.01	0.00	2.00	17.6	35.1	UnDef	0.00
0.33	148.7	0.42	0.28	3.3	9	124.1	0.02	0.02	0.00	2.00	28.5	57.0	UnDef	0.00
0.49	122.6	1.34	1.10	0.6	8	120.9	0.03	0.03	0.00	2.00	29.4	58.7	UnDef	0.00
0.66	90.6	1.33	1.47	-0.2	8	120.9	0.04	0.04	0.00	2.00	21.7	43.4	UnDef	0.00
0.82	57.5	1.16	2.02	-0.2	7	117.8	0.05	0.05	0.00	2.00	18.4	36.7	UnDef	0.00
0.98	37.5	0.78	2.09	-0.8	6	114.6	0.06	0.06	0.00	2.00	14.4	28.7	2.99	0.00
1.15	30.4	0.69	2.28	-0.8	6	114.6	0.07	0.07	0.00	2.00	11.6	23.3	2.42	0.00
1.31	31.9	0.59	1.85	-0.2	6	114.6	0.08	0.08	0.00	2.00	12.2	24.4	2.55	0.10
1.48	28.5	0.19	0.67	-0.8	7	117.8	0.09	0.09	0.00	2.00	9.1	18.2	UnDef	0.10
1.64	21.5	0.17	0.79	-1.5	6	114.6	0.10	0.10	0.00	2.00	8.3	16.5	1.72	0.09
1.80	16.5	0.11	0.67	-2.8	6	114.6	0.11	0.11	0.00	2.00	6.3	12.6	1.31	0.08
1.97	15.7	0.12	0.77	-3.2	6	114.6	0.12	0.12	0.00	2.00	6.0	12.0	1.24	0.08
2.13	14.9	0.18	1.21	-3.3	6	114.6	0.13	0.13	0.00	2.00	5.7	11.4	1.18	0.08
2.30	14.2	0.21	1.48	-3.4	6	114.6	0.14	0.14	0.00	2.00	5.4	10.9	1.13	0.08
2.46	13.2	0.13	0.99	-3.8	6	114.6	0.14	0.14	0.00	2.00	5.1	10.1	1.04	0.08
2.62	12.5	0.12	0.97	-3.7	6	114.6	0.15	0.15	0.00	2.00	4.8	9.5	0.98	0.00
2.79	12.0	0.18	1.50	-3.7	5	114.6	0.16	0.16	0.00	2.00	5.7	11.5	0.95	0.08
2.95	12.3	0.23	1.88	-4.1	5	114.6	0.17	0.17	0.00	2.00	5.9	11.8	0.97	0.09
3.12	12.9	0.20	1.56	-3.8	5	114.6	0.18	0.18	0.00	2.00	6.2	12.3	1.02	0.08
3.28	14.7	0.15	1.02	-3.9	6	114.6	0.19	0.19	0.00	2.00	5.6	11.2	1.16	0.08
3.44	14.0	0.16	1.14	-4.2	6	114.6	0.20	0.20	0.00	2.00	5.4	10.8	1.11	0.08
3.61	13.2	0.16	1.21	-4.4	6	114.6	0.21	0.21	0.00	2.00	5.1	10.1	1.04	0.08
3.77	12.6	0.14	1.11	-4.9	6	114.6	0.22	0.22	0.00	2.00	4.8	9.7	0.99	0.08
3.94	12.1	0.15	1.24	-5.1	6	114.6	0.23	0.23	0.00	2.00	4.6	9.3	0.95	0.08
4.10	10.5	0.17	1.62	-5.0	5	114.6	0.24	0.24	0.00	2.00	5.0	10.0	0.82	0.09
4.27	9.7	0.19	1.97	-4.9	5	114.6	0.25	0.25	0.00	2.00	4.6	9.3	0.76	0.09
4.43	7.9	0.14	1.77	-5.8	5	114.6	0.26	0.26	0.00	1.97	3.8	7.5	0.61	0.09
4.59	7.7	0.15	1.96	-5.5	5	114.6	0.27	0.27	0.00	1.94	3.7	7.1	0.59	0.09
4.76	7.8	0.13	1.67	-5.4	5	114.6	0.28	0.28	0.00	1.90	3.7	7.1	0.60	0.09
4.92	9.1	0.14	1.54	-5.2	5	114.6	0.29	0.29	0.00	1.87	4.4	8.2	0.71	0.09
5.09	21.9	0.11	0.50	-5.1	7	117.8	0.29	0.29	0.00	1.84	7.0	12.9	UnDef	0.09
5.25	36.3	0.14	0.39	-5.4	7	117.8	0.30	0.30	0.00	1.81	11.6	21.0	UnDef	0.10

Gregg In Situ, Inc.
Run No: 98-0720-1458-2827
CPT File: 124C01.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
5.41	38.7	0.28	0.72	-4.9	7	117.8	0.31	0.31	0.00	1.78	12.4	22.1	UnDef	0.11
5.58	44.0	0.38	0.87	-5.1	7	117.8	0.32	0.32	0.00	1.76	14.0	24.7	UnDef	0.13
5.74	51.7	0.39	0.76	-4.9	7	117.8	0.33	0.33	0.00	1.73	16.5	28.6	UnDef	0.15
5.91	55.2	0.45	0.82	-5.0	8	120.9	0.34	0.34	0.00	1.71	13.2	22.6	UnDef	0.16
6.07	55.1	0.47	0.85	-5.1	7	117.8	0.35	0.35	0.00	1.68	17.6	29.6	UnDef	0.16
6.23	54.7	0.49	0.90	-5.4	7	117.8	0.36	0.36	0.00	1.66	17.4	29.0	UnDef	0.16
6.40	53.7	0.50	0.93	-5.2	7	117.8	0.37	0.37	0.00	1.64	17.2	28.1	UnDef	0.15
6.56	52.5	0.50	0.96	-5.4	7	117.8	0.38	0.38	0.00	1.62	16.8	27.1	UnDef	0.15
6.73	50.0	0.48	0.96	-5.6	7	117.8	0.39	0.39	0.00	1.60	16.0	25.5	UnDef	0.14
6.89	46.7	0.44	0.94	-5.5	7	117.8	0.40	0.40	0.00	1.58	14.9	23.5	UnDef	0.13
7.05	43.3	0.43	1.00	-5.7	7	117.8	0.41	0.41	0.00	1.56	13.8	21.6	UnDef	0.12
7.22	37.4	0.45	1.21	-6.2	7	117.8	0.42	0.42	0.00	1.54	11.9	18.4	UnDef	0.12
7.38	37.8	0.41	1.09	-6.2	7	117.8	0.43	0.43	0.00	1.52	12.1	18.4	UnDef	0.11
7.55	37.7	0.31	0.83	-5.9	7	117.8	0.44	0.44	0.00	1.51	12.0	18.1	UnDef	0.11
7.71	37.5	0.29	0.78	-5.5	7	117.8	0.45	0.45	0.00	1.49	12.0	17.8	UnDef	0.10
7.87	37.2	0.31	0.84	-4.2	7	117.8	0.46	0.46	0.00	1.48	11.9	17.5	UnDef	0.11
8.04	37.5	0.31	0.83	-3.4	7	117.8	0.47	0.47	0.00	1.46	12.0	17.5	UnDef	0.11
8.20	35.8	0.22	0.62	-2.2	7	117.8	0.48	0.48	0.00	1.45	11.4	16.5	UnDef	0.10
8.37	32.9	0.23	0.70	-1.4	7	117.8	0.49	0.49	0.00	1.43	10.5	15.0	UnDef	0.10
8.53	31.2	0.22	0.71	-2.9	7	117.8	0.50	0.50	0.00	1.42	10.0	14.1	UnDef	0.10
8.69	30.2	0.22	0.73	0.3	7	117.8	0.51	0.51	0.00	1.40	9.6	13.5	UnDef	0.09
8.86	29.5	0.20	0.68	0.8	7	117.8	0.52	0.52	0.00	1.39	9.4	13.1	UnDef	0.09
9.02	29.0	0.21	0.72	1.1	7	117.8	0.53	0.53	0.00	1.38	9.3	12.8	UnDef	0.09
9.19	29.0	0.21	0.72	1.3	7	117.8	0.54	0.54	0.00	1.37	9.3	12.7	UnDef	0.09
9.35	29.7	0.21	0.71	1.3	7	117.8	0.55	0.55	0.00	1.35	9.5	12.8	UnDef	0.09
9.51	29.2	0.22	0.75	0.8	7	117.8	0.56	0.56	0.00	1.34	9.3	12.5	UnDef	0.09
9.68	29.9	0.22	0.74	1.0	7	117.8	0.57	0.57	0.00	1.33	9.5	12.7	UnDef	0.09
9.84	30.9	0.22	0.71	-0.6	7	117.8	0.58	0.58	0.00	1.32	9.9	13.0	UnDef	0.09
10.01	28.9	0.24	0.83	-0.9	7	117.8	0.59	0.58	0.00	1.31	9.2	12.1	UnDef	0.09
10.17	27.7	0.25	0.91	-0.4	7	117.8	0.59	0.59	0.01	1.30	8.8	11.5	UnDef	0.09
10.33	27.0	0.24	0.89	-0.6	7	117.8	0.60	0.59	0.01	1.30	8.6	11.2	UnDef	0.09
10.50	27.6	0.22	0.80	1.4	7	117.8	0.61	0.60	0.02	1.29	8.8	11.4	UnDef	0.09
10.66	28.0	0.21	0.75	2.3	7	117.8	0.62	0.60	0.02	1.29	8.9	11.5	UnDef	0.09
10.83	27.4	0.21	0.77	3.9	7	117.8	0.63	0.61	0.03	1.28	8.7	11.2	UnDef	0.09
10.99	29.2	0.20	0.69	3.4	7	117.8	0.64	0.61	0.03	1.28	9.3	11.9	UnDef	0.09
11.15	30.1	0.22	0.73	3.1	7	117.8	0.65	0.62	0.04	1.27	9.6	12.2	UnDef	0.09
11.32	37.6	0.26	0.69	3.1	7	117.8	0.66	0.62	0.04	1.27	12.0	15.2	UnDef	0.10
11.48	48.9	0.34	0.70	0.7	7	117.8	0.67	0.63	0.05	1.26	15.6	19.7	UnDef	0.11
11.65	69.9	0.45	0.65	2.3	8	120.9	0.68	0.63	0.05	1.26	16.7	21.1	UnDef	0.15
11.81	133.6	0.90	0.68	-2.4	9	124.1	0.69	0.64	0.06	1.25	25.6	32.1	UnDef	0.00
11.97	197.2	1.58	0.80	-6.7	9	124.1	0.70	0.64	0.06	1.25	37.8	47.2	UnDef	0.00
12.14	236.7	2.25	0.95	-7.8	9	124.1	0.71	0.65	0.07	1.24	45.3	56.4	UnDef	0.00
12.30	262.0	2.86	1.09	-9.2	9	124.1	0.72	0.65	0.07	1.24	50.2	62.2	UnDef	0.00
12.47	271.5	3.45	1.27	-10.3	9	124.1	0.73	0.66	0.08	1.24	52.0	64.2	UnDef	0.00
12.63	271.1	3.86	1.42	-11.6	8	120.9	0.74	0.66	0.08	1.23	64.9	79.9	UnDef	0.00
12.80	281.2	4.26	1.51	-14.3	8	120.9	0.75	0.67	0.09	1.23	67.3	82.6	UnDef	0.00
12.96	295.4	4.77	1.62	-15.9	8	120.9	0.76	0.67	0.09	1.22	70.7	86.4	UnDef	0.00
13.12	300.8	5.13	1.71	-17.9	8	120.9	0.77	0.67	0.10	1.22	72.0	87.7	UnDef	0.00
13.29	300.4	5.20	1.73	-20.5	8	120.9	0.78	0.68	0.10	1.21	71.9	87.2	UnDef	0.00
13.45	296.3	5.45	1.84	-21.9	8	120.9	0.79	0.68	0.11	1.21	70.9	85.8	UnDef	0.00
13.62	287.1	5.21	1.82	-23.4	8	120.9	0.80	0.69	0.11	1.20	68.7	82.8	UnDef	0.00
13.78	267.0	4.46	1.67	-24.6	8	120.9	0.81	0.69	0.12	1.20	63.9	76.7	UnDef	0.00
13.94	250.6	3.92	1.56	-25.7	8	120.9	0.82	0.70	0.12	1.20	60.0	71.8	UnDef	0.00
14.11	235.4	3.03	1.29	-26.0	8	120.9	0.83	0.70	0.13	1.19	56.4	67.2	UnDef	0.00

Gregg In Situ, Inc.
Run No: 98-0720-1458-2827
CPT File: 124C01.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
14.27	211.2	2.71	1.28	-26.2	8	120.9	0.84	0.71	0.13	1.19	50.6	60.1	UnDef	0.00
14.44	172.9	1.99	1.15	-1.6	8	120.9	0.85	0.71	0.14	1.18	41.4	49.0	UnDef	0.00
14.60	161.1	1.49	0.93	-3.6	9	124.1	0.86	0.72	0.14	1.18	30.9	36.4	UnDef	0.00
14.76	153.3	1.27	0.83	-3.8	9	124.1	0.87	0.72	0.15	1.18	29.4	34.5	UnDef	0.00
14.93	130.6	1.08	0.83	-3.9	9	124.1	0.88	0.73	0.15	1.17	25.0	29.3	UnDef	0.41
15.09	123.4	0.88	0.71	-3.8	9	124.1	0.89	0.73	0.16	1.17	23.6	27.6	UnDef	0.34
15.26	149.5	0.87	0.58	-4.0	9	124.1	0.90	0.74	0.16	1.16	28.6	33.3	UnDef	0.00
15.42	161.5	1.03	0.64	-6.9	9	124.1	0.91	0.74	0.17	1.16	30.9	35.9	UnDef	0.00
15.58	160.4	1.23	0.77	-7.1	9	124.1	0.92	0.75	0.17	1.16	30.7	35.5	UnDef	0.00
15.75	157.7	1.44	0.92	-6.7	9	124.1	0.93	0.75	0.18	1.15	30.2	34.8	UnDef	0.00
15.91	152.0	1.48	0.98	-6.6	9	124.1	0.94	0.76	0.18	1.15	29.1	33.4	UnDef	0.00
16.08	146.0	1.46	1.00	-5.9	9	124.1	0.95	0.76	0.19	1.14	28.0	32.0	UnDef	0.00
16.24	139.4	1.28	0.92	-5.8	9	124.1	0.96	0.77	0.19	1.14	26.7	30.4	UnDef	0.00
16.40	132.9	1.10	0.83	-4.9	9	124.1	0.97	0.77	0.20	1.14	25.5	28.9	UnDef	0.40
16.57	130.0	1.01	0.78	-4.4	9	124.1	0.98	0.78	0.21	1.13	24.9	28.2	UnDef	0.37
16.73	118.8	0.91	0.77	-3.7	9	124.1	0.99	0.78	0.21	1.13	22.8	25.7	UnDef	0.31
16.90	101.3	0.76	0.75	-3.1	8	120.9	1.00	0.79	0.22	1.13	24.3	27.3	UnDef	0.23
17.06	82.8	0.57	0.69	-2.6	8	120.9	1.01	0.79	0.22	1.12	19.8	22.3	UnDef	0.17
17.22	69.0	0.39	0.57	-2.3	8	120.9	1.02	0.80	0.23	1.12	16.5	18.5	UnDef	0.13
17.39	65.8	1.01	1.54	-1.2	7	117.8	1.03	0.80	0.23	1.12	21.0	23.4	UnDef	0.18
17.55	73.8	3.02	4.09	0.1	5	114.6	1.04	0.81	0.24	1.11	35.3	39.3	5.82	0.00
17.72	125.4	3.38	2.69	1.9	7	117.8	1.05	0.81	0.24	1.11	40.0	44.4	UnDef	0.00
17.88	245.4	2.15	0.87	3.9	9	124.1	1.06	0.82	0.25	1.11	47.0	52.0	UnDef	0.00
18.04	185.2	3.66	1.98	2.7	7	117.8	1.07	0.82	0.25	1.10	59.1	65.2	UnDef	0.00
18.21	102.9	10.33	10.03	3.2	11	130.5	1.08	0.83	0.26	1.10	28.2	31.0	UnDef	0.00
18.37	178.7	11.92	6.67	3.4	11	130.5	1.09	0.83	0.26	1.10	48.9	53.6	UnDef	0.00
18.54	190.9	8.24	4.32	3.6	11	130.5	1.10	0.84	0.27	1.09	52.2	57.1	UnDef	0.00
18.70	289.4	5.69	1.97	3.2	8	120.9	1.11	0.84	0.27	1.09	69.3	75.5	UnDef	0.00
18.86	164.5	4.94	3.00	2.7	7	117.8	1.12	0.85	0.28	1.09	52.5	57.1	UnDef	0.00
19.03	193.3	1.72	0.89	5.4	9	124.1	1.13	0.85	0.28	1.08	37.0	40.1	UnDef	0.00
19.19	132.9	1.44	1.09	3.7	8	120.9	1.14	0.86	0.29	1.08	31.8	34.4	UnDef	0.41
19.36	92.9	3.12	3.36	4.2	6	114.6	1.15	0.86	0.29	1.08	35.6	38.3	7.34	0.00
19.52	99.1	3.53	3.56	4.2	6	114.6	1.16	0.87	0.30	1.07	38.0	40.8	7.84	0.00
19.68	99.5	1.48	1.49	3.6	8	120.9	1.17	0.87	0.30	1.07	23.8	25.5	UnDef	0.29
19.85	91.8	0.92	1.00	5.0	8	120.9	1.18	0.88	0.31	1.07	22.0	23.5	UnDef	0.21
20.01	111.3	0.70	0.63	0.8	9	124.1	1.19	0.88	0.31	1.07	21.3	22.7	UnDef	0.24
20.18	95.4	0.61	0.64	-8.2	8	120.9	1.20	0.89	0.32	1.06	22.9	24.3	UnDef	0.19
20.34	84.7	0.49	0.58	-7.7	8	120.9	1.21	0.89	0.32	1.06	20.3	21.5	UnDef	0.16
20.51	65.1	0.48	0.74	-2.1	8	120.9	1.22	0.89	0.33	1.06	15.6	16.5	UnDef	0.13
20.67	44.7	0.70	1.57	2.8	7	117.8	1.23	0.90	0.33	1.05	14.3	15.0	UnDef	0.14
20.83	37.4	0.46	1.23	4.9	7	117.8	1.24	0.90	0.34	1.05	11.9	12.6	UnDef	0.11
21.00	57.4	0.27	0.47	8.8	8	120.9	1.25	0.91	0.34	1.05	13.7	14.4	UnDef	0.10
21.16	54.1	0.23	0.43	-10.2	8	120.9	1.26	0.91	0.35	1.05	13.0	13.6	UnDef	0.10
21.33	47.3	0.24	0.51	-8.3	8	120.9	1.27	0.92	0.35	1.04	11.3	11.8	UnDef	0.10
21.49	36.4	0.35	0.96	-3.9	7	117.8	1.28	0.92	0.36	1.04	11.6	12.1	UnDef	0.10
21.65	25.0	0.26	1.04	-1.0	6	114.6	1.29	0.93	0.36	1.04	9.6	10.0	1.90	0.10
21.82	21.0	0.12	0.57	11.7	7	117.8	1.30	0.93	0.37	1.04	6.7	6.9	UnDef	0.09
21.98	21.0	0.10	0.48	29.1	7	117.8	1.31	0.94	0.37	1.03	6.7	6.9	UnDef	0.09
22.15	20.9	0.10	0.48	34.2	7	117.8	1.32	0.94	0.38	1.03	6.7	6.9	UnDef	0.09
22.31	21.1	0.11	0.52	40.0	7	117.8	1.33	0.95	0.38	1.03	6.7	6.9	UnDef	0.09
22.47	20.4	0.12	0.59	40.1	6	114.6	1.34	0.95	0.39	1.03	7.8	8.0	1.52	0.09
22.64	19.7	0.13	0.66	50.5	6	114.6	1.35	0.95	0.39	1.02	7.5	7.7	1.46	0.09
22.80	19.6	0.13	0.67	51.8	6	114.6	1.36	0.96	0.40	1.02	7.5	7.7	1.46	0.09
22.97	19.4	0.12	0.62	53.1	6	114.6	1.37	0.96	0.40	1.02	7.4	7.6	1.44	0.09

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
23.13	19.5	0.06	0.31	54.7	7	117.8	1.38	0.97	0.41	1.02	6.2	6.3	UnDef	0.00
23.29	24.7	0.08	0.32	62.8	7	117.8	1.39	0.97	0.42	1.01	7.9	8.0	UnDef	0.00
23.46	38.8	0.09	0.23	20.2	8	120.9	1.40	0.98	0.42	1.01	9.3	9.4	UnDef	0.09
23.62	51.9	0.13	0.25	10.0	8	120.9	1.41	0.98	0.43	1.01	12.4	12.6	UnDef	0.09
23.79	63.1	0.21	0.33	-9.2	8	120.9	1.42	0.99	0.43	1.01	15.1	15.2	UnDef	0.10
23.95	57.4	0.45	0.79	11.0	8	120.9	1.43	0.99	0.44	1.00	13.7	13.8	UnDef	0.12
24.11	38.4	0.58	1.51	12.2	7	117.8	1.44	1.00	0.44	1.00	12.3	12.3	UnDef	0.13
24.28	31.1	0.52	1.68	15.8	6	114.6	1.45	1.00	0.45	1.00	11.9	11.9	2.37	0.15
24.44	32.8	0.39	1.19	27.5	7	117.8	1.46	1.00	0.45	1.00	10.5	10.5	UnDef	0.11
24.61	59.3	0.33	0.56	22.2	8	120.9	1.46	1.01	0.46	1.00	14.2	14.1	UnDef	0.11
24.77	74.7	0.30	0.40	8.9	8	120.9	1.47	1.01	0.46	0.99	17.9	17.8	UnDef	0.12
24.93	71.9	0.31	0.43	9.9	8	120.9	1.48	1.02	0.47	0.99	17.2	17.1	UnDef	0.11
25.10	65.4	0.45	0.69	12.1	8	120.9	1.49	1.02	0.47	0.99	15.7	15.5	UnDef	0.13
25.26	73.4	0.21	0.29	8.2	8	120.9	1.50	1.03	0.48	0.99	17.6	17.3	UnDef	0.11
25.43	82.5	0.28	0.34	-5.9	8	120.9	1.51	1.03	0.48	0.98	19.7	19.4	UnDef	0.13
25.59	53.1	0.31	0.58	-1.3	8	120.9	1.52	1.04	0.49	0.98	12.7	12.5	UnDef	0.11
25.75	51.0	0.32	0.63	-0.2	8	120.9	1.53	1.04	0.49	0.98	12.2	12.0	UnDef	0.11
25.92	48.8	0.33	0.68	-4.2	7	117.8	1.54	1.05	0.50	0.98	15.6	15.2	UnDef	0.11
26.08	48.1	0.32	0.67	-5.6	7	117.8	1.55	1.05	0.50	0.98	15.4	15.0	UnDef	0.11
26.25	46.0	0.32	0.70	-9.1	7	117.8	1.56	1.06	0.51	0.97	14.7	14.3	UnDef	0.10
26.41	42.7	0.33	0.77	-10.8	7	117.8	1.57	1.06	0.51	0.97	13.6	13.2	UnDef	0.10
26.57	38.8	0.29	0.75	-12.1	7	117.8	1.58	1.07	0.52	0.97	12.4	12.0	UnDef	0.10
26.74	37.4	0.24	0.64	-13.0	7	117.8	1.59	1.07	0.52	0.97	11.9	11.5	UnDef	0.10
26.90	33.8	0.24	0.71	-13.7	7	117.8	1.60	1.07	0.53	0.96	10.8	10.4	UnDef	0.10
27.07	29.5	0.23	0.78	-13.4	7	117.8	1.61	1.08	0.53	0.96	9.4	9.1	UnDef	0.10
27.23	27.7	0.18	0.65	-12.7	7	117.8	1.62	1.08	0.54	0.96	8.9	8.5	UnDef	0.09
27.39	26.1	0.13	0.50	-11.7	7	117.8	1.63	1.09	0.54	0.96	8.3	8.0	UnDef	0.09
27.56	24.0	0.06	0.25	-11.0	7	117.8	1.64	1.09	0.55	0.96	7.7	7.3	UnDef	0.00
27.72	26.8	0.20	0.75	-9.9	7	117.8	1.65	1.10	0.55	0.95	8.6	8.2	UnDef	0.10
27.89	71.8	0.33	0.46	-8.3	8	120.9	1.66	1.10	0.56	0.95	17.2	16.4	UnDef	0.11
28.05	88.3	0.44	0.50	-8.8	8	120.9	1.67	1.11	0.56	0.95	21.1	20.1	UnDef	0.15
28.21	70.8	0.48	0.68	-8.4	8	120.9	1.68	1.11	0.57	0.95	17.0	16.1	UnDef	0.13
28.38	57.5	0.53	0.92	-7.5	7	117.8	1.69	1.12	0.57	0.95	18.4	17.4	UnDef	0.12
28.54	54.1	0.42	0.78	-7.1	8	120.9	1.70	1.12	0.58	0.94	13.0	12.2	UnDef	0.12
28.71	49.4	0.39	0.79	-0.6	7	117.8	1.71	1.13	0.58	0.94	15.8	14.9	UnDef	0.11
28.87	43.8	0.40	0.92	-4.7	7	117.8	1.72	1.13	0.59	0.94	14.0	13.1	UnDef	0.11
29.04	38.6	0.41	1.06	-6.4	7	117.8	1.73	1.13	0.59	0.94	12.3	11.6	UnDef	0.11
29.20	37.1	0.45	1.22	-7.7	7	117.8	1.74	1.14	0.60	0.94	11.8	11.1	UnDef	0.12
29.36	40.5	0.48	1.19	-8.1	7	117.8	1.75	1.14	0.60	0.94	12.9	12.1	UnDef	0.12
29.53	48.8	0.42	0.86	-8.7	7	117.8	1.76	1.15	0.61	0.93	15.6	14.5	UnDef	0.11
29.69	57.4	0.44	0.77	-10.8	8	120.9	1.77	1.15	0.61	0.93	13.8	12.8	UnDef	0.12
29.86	54.8	0.42	0.77	-13.0	8	120.9	1.78	1.16	0.62	0.93	13.1	12.2	UnDef	0.12
30.02	53.5	0.40	0.75	-13.2	8	120.9	1.79	1.16	0.63	0.93	12.8	11.9	UnDef	0.11
30.18	44.5	0.42	0.95	-14.5	7	117.8	1.80	1.17	0.63	0.93	14.2	13.1	UnDef	0.11
30.35	37.7	0.38	1.01	-15.5	7	117.8	1.81	1.17	0.64	0.92	12.0	11.1	UnDef	0.11
30.51	38.2	0.34	0.89	-16.5	7	117.8	1.82	1.18	0.64	0.92	12.2	11.2	UnDef	0.11
30.68	27.7	0.33	1.19	-16.8	6	114.6	1.83	1.18	0.65	0.92	10.6	9.8	2.07	0.13
30.84	28.0	0.32	1.14	-16.1	6	114.6	1.84	1.18	0.65	0.92	10.7	9.9	2.10	0.13
31.00	34.2	0.34	1.00	-16.2	7	117.8	1.84	1.19	0.66	0.92	10.9	10.0	UnDef	0.11
31.17	27.9	0.30	1.08	-16.1	7	117.8	1.85	1.19	0.66	0.92	8.9	8.1	UnDef	0.12
31.33	26.6	0.23	0.87	-16.4	7	117.8	1.86	1.20	0.67	0.91	8.5	7.8	UnDef	0.11
31.50	25.7	0.21	0.82	-15.8	7	117.8	1.87	1.20	0.67	0.91	8.2	7.5	UnDef	0.11
31.66	25.1	0.15	0.60	-14.9	7	117.8	1.88	1.21	0.68	0.91	8.0	7.3	UnDef	0.10
31.82	29.4	0.14	0.48	-14.8	7	117.8	1.89	1.21	0.68	0.91	9.4	8.5	UnDef	0.09

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
31.99	25.8	0.16	0.62	-11.9	7	117.8	1.90	1.22	0.69	0.91	8.2	7.5	UnDef	0.10
32.15	24.8	0.18	0.73	-11.3	7	117.8	1.91	1.22	0.69	0.91	7.9	7.2	UnDef	0.10
32.32	30.8	0.20	0.65	-10.3	7	117.8	1.92	1.23	0.70	0.90	9.8	8.9	UnDef	0.10
32.48	30.7	0.25	0.82	-10.8	7	117.8	1.93	1.23	0.70	0.90	9.8	8.9	UnDef	0.10
32.64	29.5	0.23	0.78	-11.3	7	117.8	1.94	1.23	0.71	0.90	9.4	8.5	UnDef	0.10
32.81	32.5	0.20	0.62	-11.2	7	117.8	1.95	1.24	0.71	0.90	10.4	9.3	UnDef	0.10
32.97	27.9	0.19	0.68	-11.9	7	117.8	1.96	1.24	0.72	0.90	8.9	8.0	UnDef	0.10
33.14	26.3	0.19	0.73	-11.9	7	117.8	1.97	1.25	0.72	0.90	8.4	7.5	UnDef	0.10
33.30	26.4	0.20	0.76	-10.9	7	117.8	1.98	1.25	0.73	0.89	8.4	7.5	UnDef	0.10
33.46	27.2	0.22	0.81	-10.7	7	117.8	1.99	1.26	0.73	0.89	8.7	7.8	UnDef	0.11
33.63	31.3	0.18	0.58	-10.1	7	117.8	2.00	1.26	0.74	0.89	10.0	8.9	UnDef	0.10
33.79	25.2	0.14	0.56	-11.2	7	117.8	2.01	1.27	0.74	0.89	8.0	7.1	UnDef	0.10
33.96	23.8	0.07	0.29	-10.6	7	117.8	2.02	1.27	0.75	0.89	7.6	6.7	UnDef	0.00
34.12	24.0	0.06	0.25	-9.5	7	117.8	2.03	1.28	0.75	0.89	7.7	6.8	UnDef	0.00
34.28	22.5	0.04	0.18	-8.8	7	117.8	2.04	1.28	0.76	0.88	7.2	6.4	UnDef	0.00
34.45	22.7	0.04	0.18	-7.8	7	117.8	2.05	1.28	0.76	0.88	7.3	6.4	UnDef	0.00
34.61	22.1	0.04	0.18	-7.9	7	117.8	2.06	1.29	0.77	0.88	7.1	6.2	UnDef	0.00
34.78	22.7	0.04	0.18	-7.1	7	117.8	2.07	1.29	0.77	0.88	7.2	6.4	UnDef	0.00
34.94	22.8	0.05	0.22	-6.3	7	117.8	2.08	1.30	0.78	0.88	7.3	6.4	UnDef	0.00
35.10	22.7	0.05	0.22	-5.7	7	117.8	2.09	1.30	0.78	0.88	7.3	6.4	UnDef	0.00
35.27	22.4	0.05	0.22	-3.0	7	117.8	2.10	1.31	0.79	0.87	7.1	6.3	UnDef	0.00
35.43	22.5	0.05	0.22	-2.3	7	117.8	2.11	1.31	0.79	0.87	7.2	6.3	UnDef	0.00
35.60	22.5	0.05	0.22	-1.8	7	117.8	2.12	1.32	0.80	0.87	7.2	6.3	UnDef	0.00
35.76	22.4	0.05	0.22	-1.3	7	117.8	2.12	1.32	0.80	0.87	7.2	6.2	UnDef	0.00
35.92	22.6	0.05	0.22	-0.6	7	117.8	2.13	1.33	0.81	0.87	7.2	6.3	UnDef	0.00
36.09	23.2	0.05	0.22	-0.1	7	117.8	2.14	1.33	0.81	0.87	7.4	6.4	UnDef	0.00
36.25	23.6	0.05	0.21	1.1	7	117.8	2.15	1.33	0.82	0.87	7.5	6.5	UnDef	0.00
36.42	23.2	0.05	0.22	1.4	7	117.8	2.16	1.34	0.82	0.86	7.4	6.4	UnDef	0.00
36.58	22.6	0.05	0.22	2.3	7	117.8	2.17	1.34	0.83	0.86	7.2	6.2	UnDef	0.00
36.74	22.2	0.05	0.23	3.3	7	117.8	2.18	1.35	0.84	0.86	7.1	6.1	UnDef	0.00
36.91	22.4	0.05	0.22	4.6	7	117.8	2.19	1.35	0.84	0.86	7.1	6.1	UnDef	0.00
37.07	22.5	0.05	0.22	5.6	7	117.8	2.20	1.36	0.85	0.86	7.2	6.2	UnDef	0.00
37.24	23.3	0.05	0.22	6.1	7	117.8	2.21	1.36	0.85	0.86	7.4	6.4	UnDef	0.00
37.40	24.1	0.05	0.21	7.1	7	117.8	2.22	1.37	0.86	0.86	7.7	6.6	UnDef	0.00
37.57	23.1	0.05	0.22	7.7	7	117.8	2.23	1.37	0.86	0.85	7.4	6.3	UnDef	0.00
37.73	23.5	0.05	0.21	8.5	7	117.8	2.24	1.38	0.87	0.85	7.5	6.4	UnDef	0.00
37.89	22.6	0.05	0.22	9.6	7	117.8	2.25	1.38	0.87	0.85	7.2	6.1	UnDef	0.00
38.06	22.7	0.05	0.22	10.9	7	117.8	2.26	1.38	0.88	0.85	7.2	6.2	UnDef	0.00
38.22	23.4	0.05	0.21	13.1	7	117.8	2.27	1.39	0.88	0.85	7.5	6.3	UnDef	0.00
38.39	22.3	0.05	0.22	18.9	7	117.8	2.28	1.39	0.89	0.85	7.1	6.0	UnDef	0.00
38.55	22.9	0.06	0.26	20.6	7	117.8	2.29	1.40	0.89	0.85	7.3	6.2	UnDef	0.00
38.71	22.3	0.06	0.27	20.7	7	117.8	2.30	1.40	0.90	0.84	7.1	6.0	UnDef	0.00
38.88	22.8	0.05	0.22	21.5	7	117.8	2.31	1.41	0.90	0.84	7.3	6.1	UnDef	0.00
39.04	23.0	0.05	0.22	23.2	7	117.8	2.32	1.41	0.91	0.84	7.3	6.2	UnDef	0.00
39.21	22.2	0.05	0.23	23.8	7	117.8	2.33	1.42	0.91	0.84	7.1	5.9	UnDef	0.00
39.37	22.7	0.05	0.22	24.8	7	117.8	2.34	1.42	0.92	0.84	7.3	6.1	UnDef	0.00
39.53	22.5	0.06	0.27	26.3	7	117.8	2.35	1.42	0.92	0.84	7.2	6.0	UnDef	0.00
39.70	22.7	0.06	0.26	27.7	7	117.8	2.36	1.43	0.93	0.84	7.3	6.1	UnDef	0.00
39.86	22.5	0.06	0.27	29.6	7	117.8	2.37	1.43	0.93	0.84	7.2	6.0	UnDef	0.00
40.03	22.6	0.06	0.27	31.1	7	117.8	2.38	1.44	0.94	0.83	7.2	6.0	UnDef	0.00
40.19	22.4	0.06	0.27	33.1	7	117.8	2.39	1.44	0.94	0.83	7.2	6.0	UnDef	0.00
40.35	22.6	0.06	0.27	34.1	7	117.8	2.40	1.45	0.95	0.83	7.2	6.0	UnDef	0.00
40.52	22.9	0.06	0.26	36.0	7	117.8	2.41	1.45	0.95	0.83	7.3	6.1	UnDef	0.00
40.68	22.7	0.06	0.26	37.9	7	117.8	2.41	1.46	0.96	0.83	7.2	6.0	UnDef	0.00

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
40.85	22.7	0.06	0.27	39.8	7	117.8	2.42	1.46	0.96	0.83	7.2	6.0	UnDef	0.00
41.01	23.1	0.06	0.26	41.4	7	117.8	2.43	1.47	0.97	0.83	7.4	6.1	UnDef	0.00
41.17	22.8	0.06	0.26	43.7	7	117.8	2.44	1.47	0.97	0.82	7.3	6.0	UnDef	0.00
41.34	22.9	0.06	0.26	45.1	7	117.8	2.45	1.47	0.98	0.82	7.3	6.0	UnDef	0.00
41.50	22.9	0.02	0.09	47.1	7	117.8	2.46	1.48	0.98	0.82	7.3	6.0	UnDef	0.00
41.67	22.4	0.02	0.09	49.2	7	117.8	2.47	1.48	0.99	0.82	7.2	5.9	UnDef	0.00
41.83	22.3	0.02	0.09	59.2	7	117.8	2.48	1.49	0.99	0.82	7.1	5.8	UnDef	0.00
41.99	22.7	0.02	0.09	61.4	7	117.8	2.49	1.49	1.00	0.82	7.2	5.9	UnDef	0.00
42.16	22.7	0.02	0.09	64.4	7	117.8	2.50	1.50	1.00	0.82	7.3	5.9	UnDef	0.00
42.32	22.7	0.02	0.09	67.0	7	117.8	2.51	1.50	1.01	0.82	7.2	5.9	UnDef	0.00
42.49	22.6	0.02	0.09	69.7	7	117.8	2.52	1.51	1.01	0.81	7.2	5.9	UnDef	0.00
42.65	23.0	0.03	0.13	72.6	7	117.8	2.53	1.51	1.02	0.81	7.3	6.0	UnDef	0.00
42.81	22.7	0.05	0.22	75.1	7	117.8	2.54	1.52	1.02	0.81	7.2	5.9	UnDef	0.00
42.98	23.2	0.05	0.22	77.4	7	117.8	2.55	1.52	1.03	0.81	7.4	6.0	UnDef	0.00
43.14	23.5	0.05	0.21	81.7	7	117.8	2.56	1.52	1.03	0.81	7.5	6.1	UnDef	0.00
43.31	24.0	0.05	0.21	85.0	7	117.8	2.57	1.53	1.04	0.81	7.7	6.2	UnDef	0.00
43.47	23.7	0.05	0.21	88.4	7	117.8	2.58	1.53	1.05	0.81	7.6	6.1	UnDef	0.00
43.63	23.4	0.05	0.21	94.4	7	117.8	2.59	1.54	1.05	0.81	7.5	6.0	UnDef	0.00
43.80	23.6	0.05	0.21	99.4	7	117.8	2.60	1.54	1.06	0.81	7.5	6.1	UnDef	0.00
43.96	23.1	0.05	0.22	104.2	7	117.8	2.61	1.55	1.06	0.80	7.4	5.9	UnDef	0.00
44.13	23.7	0.05	0.21	108.4	7	117.8	2.62	1.55	1.07	0.80	7.6	6.1	UnDef	0.00
44.29	23.5	0.05	0.21	111.0	7	117.8	2.63	1.56	1.07	0.80	7.5	6.0	UnDef	0.00
44.45	23.7	0.05	0.21	116.6	7	117.8	2.64	1.56	1.08	0.80	7.6	6.1	UnDef	0.00
44.62	23.4	0.05	0.21	120.6	7	117.8	2.65	1.57	1.08	0.80	7.5	6.0	UnDef	0.00
44.78	23.5	0.05	0.21	123.5	7	117.8	2.66	1.57	1.09	0.80	7.5	6.0	UnDef	0.00
44.95	23.8	0.05	0.21	124.7	7	117.8	2.67	1.57	1.09	0.80	7.6	6.0	UnDef	0.00
45.11	24.1	0.05	0.21	125.7	7	117.8	2.68	1.58	1.10	0.80	7.7	6.1	UnDef	0.00
45.28	23.7	0.05	0.21	119.1	7	117.8	2.69	1.58	1.10	0.79	7.6	6.0	UnDef	0.00
45.44	23.8	0.05	0.21	124.1	7	117.8	2.69	1.59	1.11	0.79	7.6	6.0	UnDef	0.00
45.60	24.1	0.05	0.21	127.3	7	117.8	2.70	1.59	1.11	0.79	7.7	6.1	UnDef	0.00
45.77	23.8	0.05	0.21	128.2	7	117.8	2.71	1.60	1.12	0.79	7.6	6.0	UnDef	0.00
45.93	24.5	0.05	0.20	128.8	7	117.8	2.72	1.60	1.12	0.79	7.8	6.2	UnDef	0.00
46.10	23.9	0.05	0.21	131.6	7	117.8	2.73	1.61	1.13	0.79	7.6	6.0	UnDef	0.00
46.26	24.4	0.05	0.21	134.0	7	117.8	2.74	1.61	1.13	0.79	7.8	6.1	UnDef	0.00
46.42	24.2	0.06	0.25	132.6	7	117.8	2.75	1.62	1.14	0.79	7.7	6.1	UnDef	0.00
46.59	24.3	0.06	0.25	134.1	7	117.8	2.76	1.62	1.14	0.79	7.8	6.1	UnDef	0.00
46.75	24.4	0.06	0.25	136.9	7	117.8	2.77	1.62	1.15	0.78	7.8	6.1	UnDef	0.00
46.92	24.4	0.06	0.25	136.2	7	117.8	2.78	1.63	1.15	0.78	7.8	6.1	UnDef	0.00
47.08	24.6	0.06	0.24	134.0	7	117.8	2.79	1.63	1.16	0.78	7.9	6.1	UnDef	0.00
47.24	24.9	0.05	0.20	136.5	7	117.8	2.80	1.64	1.16	0.78	8.0	6.2	UnDef	0.00
47.41	24.4	0.05	0.21	136.0	7	117.8	2.81	1.64	1.17	0.78	7.8	6.1	UnDef	0.00
47.57	24.5	0.05	0.20	136.3	7	117.8	2.82	1.65	1.17	0.78	7.8	6.1	UnDef	0.00
47.74	24.6	0.05	0.20	132.2	7	117.8	2.83	1.65	1.18	0.78	7.8	6.1	UnDef	0.00
47.90	24.9	0.05	0.20	133.7	7	117.8	2.84	1.66	1.18	0.78	8.0	6.2	UnDef	0.00
48.06	24.7	0.05	0.20	140.0	7	117.8	2.85	1.66	1.19	0.78	7.9	6.1	UnDef	0.00
48.23	24.8	0.05	0.20	139.1	7	117.8	2.86	1.67	1.19	0.77	7.9	6.1	UnDef	0.00
48.39	25.2	0.05	0.20	142.3	7	117.8	2.87	1.67	1.20	0.77	8.0	6.2	UnDef	0.00
48.56	25.2	0.05	0.20	145.6	7	117.8	2.88	1.67	1.20	0.77	8.0	6.2	UnDef	0.00
48.72	25.1	0.05	0.20	143.9	7	117.8	2.89	1.68	1.21	0.77	8.0	6.2	UnDef	0.00
48.88	25.2	0.05	0.20	142.0	7	117.8	2.90	1.68	1.21	0.77	8.0	6.2	UnDef	0.00
49.05	25.0	0.05	0.20	141.3	7	117.8	2.91	1.69	1.22	0.77	8.0	6.1	UnDef	0.00
49.21	25.5	0.05	0.20	142.4	7	117.8	2.92	1.69	1.22	0.77	8.2	6.3	UnDef	0.00
49.38	24.7	0.05	0.20	145.6	7	117.8	2.93	1.70	1.23	0.77	7.9	6.1	UnDef	0.00
49.54	24.8	0.05	0.20	150.8	7	117.8	2.94	1.70	1.23	0.77	7.9	6.1	UnDef	0.00

Gregg In Situ, Inc.
Run No: 98-0720-1458-2827
CPT File: 124C01.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
49.70	25.2	0.05	0.20	151.6	7	117.8	2.95	1.71	1.24	0.77	8.0	6.2	UnDef	0.00
49.87	25.6	0.05	0.20	149.7	7	117.8	2.96	1.71	1.24	0.76	8.2	6.3	UnDef	0.00
50.03	25.5	0.06	0.24	149.1	7	117.8	2.97	1.72	1.25	0.76	8.1	6.2	UnDef	0.00
50.20	25.4	0.06	0.24	151.0	7	117.8	2.97	1.72	1.26	0.76	8.1	6.2	UnDef	0.00
50.36	25.8	0.06	0.23	152.7	7	117.8	2.98	1.72	1.26	0.76	8.2	6.3	UnDef	0.00
50.52	26.1	0.06	0.23	153.8	7	117.8	2.99	1.73	1.27	0.76	8.3	6.3	UnDef	0.00
50.69	25.9	0.06	0.23	149.0	7	117.8	3.00	1.73	1.27	0.76	8.3	6.3	UnDef	0.00
50.85	26.1	0.06	0.23	148.8	7	117.8	3.01	1.74	1.28	0.76	8.3	6.3	UnDef	0.00
51.02	25.7	0.06	0.23	147.1	7	117.8	3.02	1.74	1.28	0.76	8.2	6.2	UnDef	0.00
51.18	26.0	0.06	0.23	146.8	7	117.8	3.03	1.75	1.29	0.76	8.3	6.3	UnDef	0.00
51.34	26.1	0.06	0.23	147.1	7	117.8	3.04	1.75	1.29	0.76	8.3	6.3	UnDef	0.00
51.51	26.2	0.04	0.15	146.4	7	117.8	3.05	1.76	1.30	0.75	8.4	6.3	UnDef	0.00
51.67	25.8	0.04	0.16	155.6	7	117.8	3.06	1.76	1.30	0.75	8.2	6.2	UnDef	0.00
51.84	26.1	0.04	0.15	154.9	7	117.8	3.07	1.77	1.31	0.75	8.3	6.3	UnDef	0.00
52.00	26.0	0.04	0.15	157.2	7	117.8	3.08	1.77	1.31	0.75	8.3	6.2	UnDef	0.00
52.16	26.2	0.04	0.15	155.1	7	117.8	3.09	1.77	1.32	0.75	8.4	6.3	UnDef	0.00
52.33	26.2	0.04	0.15	157.7	7	117.8	3.10	1.78	1.32	0.75	8.4	6.3	UnDef	0.00
52.49	26.6	0.04	0.15	161.4	7	117.8	3.11	1.78	1.33	0.75	8.5	6.4	UnDef	0.00
52.66	26.2	0.04	0.15	167.1	7	117.8	3.12	1.79	1.33	0.75	8.4	6.3	UnDef	0.00
52.82	26.3	0.04	0.15	167.9	7	117.8	3.13	1.79	1.34	0.75	8.4	6.3	UnDef	0.00
52.98	26.6	0.04	0.15	169.2	7	117.8	3.14	1.80	1.34	0.75	8.5	6.3	UnDef	0.00
53.15	26.7	0.04	0.15	163.1	7	117.8	3.15	1.80	1.35	0.75	8.5	6.4	UnDef	0.00
53.31	26.6	0.04	0.15	161.6	7	117.8	3.16	1.81	1.35	0.74	8.5	6.3	UnDef	0.00
53.48	27.3	0.04	0.15	164.9	7	117.8	3.17	1.81	1.36	0.74	8.7	6.5	UnDef	0.00
53.64	27.0	0.04	0.15	164.9	7	117.8	3.18	1.82	1.36	0.74	8.6	6.4	UnDef	0.00
53.81	27.0	0.04	0.15	167.4	7	117.8	3.19	1.82	1.37	0.74	8.6	6.4	UnDef	0.00
53.97	27.1	0.04	0.15	172.5	7	117.8	3.20	1.82	1.37	0.74	8.6	6.4	UnDef	0.00
54.13	27.5	0.05	0.18	176.2	7	117.8	3.21	1.83	1.38	0.74	8.8	6.5	UnDef	0.00
54.30	27.4	0.05	0.18	174.0	7	117.8	3.22	1.83	1.38	0.74	8.8	6.5	UnDef	0.00
54.46	27.9	0.05	0.18	175.4	7	117.8	3.23	1.84	1.39	0.74	8.9	6.6	UnDef	0.00
54.63	27.8	0.05	0.18	179.2	7	117.8	3.24	1.84	1.39	0.74	8.9	6.5	UnDef	0.00
54.79	28.3	0.05	0.18	180.9	7	117.8	3.25	1.85	1.40	0.74	9.0	6.6	UnDef	0.00
54.95	28.3	0.05	0.18	184.6	7	117.8	3.26	1.85	1.40	0.73	9.0	6.6	UnDef	0.00
55.12	28.3	0.04	0.14	182.1	7	117.8	3.26	1.86	1.41	0.73	9.0	6.6	UnDef	0.00
55.28	27.8	0.04	0.14	177.7	7	117.8	3.27	1.86	1.41	0.73	8.9	6.5	UnDef	0.00
55.45	27.4	0.04	0.15	174.5	7	117.8	3.28	1.87	1.42	0.73	8.7	6.4	UnDef	0.00
55.61	27.7	0.04	0.14	173.1	7	117.8	3.29	1.87	1.42	0.73	8.8	6.5	UnDef	0.00
55.77	28.6	0.04	0.14	180.4	7	117.8	3.30	1.87	1.43	0.73	9.1	6.7	UnDef	0.00
55.94	28.7	0.02	0.07	169.3	7	117.8	3.31	1.88	1.43	0.73	9.2	6.7	UnDef	0.00
56.10	28.7	0.02	0.07	168.7	7	117.8	3.32	1.88	1.44	0.73	9.2	6.7	UnDef	0.00
56.27	28.8	0.03	0.10	175.5	7	117.8	3.33	1.89	1.44	0.73	9.2	6.7	UnDef	0.00
56.43	28.6	0.04	0.14	176.7	7	117.8	3.34	1.89	1.45	0.73	9.1	6.6	UnDef	0.00
56.59	29.1	0.04	0.14	183.4	7	117.8	3.35	1.90	1.45	0.73	9.3	6.7	UnDef	0.00
56.76	29.3	0.04	0.14	172.9	7	117.8	3.36	1.90	1.46	0.73	9.4	6.8	UnDef	0.00
56.92	29.0	0.04	0.14	178.6	7	117.8	3.37	1.91	1.47	0.72	9.3	6.7	UnDef	0.00
57.09	29.1	0.04	0.14	180.4	7	117.8	3.38	1.91	1.47	0.72	9.3	6.7	UnDef	0.00
57.25	29.2	0.04	0.14	181.2	7	117.8	3.39	1.91	1.48	0.72	9.3	6.7	UnDef	0.00
57.41	29.4	0.04	0.14	180.9	7	117.8	3.40	1.92	1.48	0.72	9.4	6.8	UnDef	0.00
57.58	29.3	0.04	0.14	187.7	7	117.8	3.41	1.92	1.49	0.72	9.4	6.8	UnDef	0.00
57.74	29.6	0.04	0.14	185.0	7	117.8	3.42	1.93	1.49	0.72	9.5	6.8	UnDef	0.00
57.91	29.9	0.06	0.20	195.3	7	117.8	3.43	1.93	1.50	0.72	9.5	6.9	UnDef	0.00
58.07	30.2	0.08	0.27	190.7	7	117.8	3.44	1.94	1.50	0.72	9.6	6.9	UnDef	0.00
58.23	31.7	0.12	0.38	183.7	7	117.8	3.45	1.94	1.51	0.72	10.1	7.3	UnDef	0.00
58.40	34.5	0.20	0.58	173.8	7	117.8	3.46	1.95	1.51	0.72	11.0	7.9	UnDef	0.12

Gregg In Situ, Inc.
Run No: 98-0720-1458-2827
CPT File: 124C01.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
58.56	35.7	0.32	0.90	119.6	7	117.8	3.47	1.95	1.52	0.72	11.4	8.2	UnDef	0.18
58.73	38.1	0.31	0.81	124.3	7	117.8	3.48	1.96	1.52	0.72	12.2	8.7	UnDef	0.15
58.89	34.9	0.19	0.55	133.9	7	117.8	3.49	1.96	1.53	0.71	11.1	8.0	UnDef	0.11
59.05	32.9	0.23	0.70	163.6	7	117.8	3.50	1.96	1.53	0.71	10.5	7.5	UnDef	0.15
59.22	40.8	0.39	0.96	174.6	7	117.8	3.51	1.97	1.54	0.71	13.0	9.3	UnDef	0.17
59.38	49.9	0.51	1.02	89.6	7	117.8	3.52	1.97	1.54	0.71	15.9	11.4	UnDef	0.15
59.55	56.8	0.61	1.08	61.8	7	117.8	3.53	1.98	1.55	0.71	18.1	12.9	UnDef	0.16
59.71	53.2	0.69	1.30	45.5	7	117.8	3.54	1.98	1.55	0.71	17.0	12.1	UnDef	0.20
59.87	45.1	0.73	1.62	47.4	7	117.8	3.54	1.99	1.56	0.71	14.4	10.2	UnDef	0.44
60.04	63.0	0.98	1.56	61.4	7	117.8	3.55	1.99	1.56	0.71	20.1	14.2	UnDef	0.24
60.20	104.5	1.32	1.27	44.2	8	120.9	3.56	2.00	1.57	0.71	25.0	17.7	UnDef	0.23
60.37	135.9	1.67	1.23	35.7	8	120.9	3.57	2.00	1.57	0.71	32.5	23.0	UnDef	0.31
60.53	155.5	2.12	1.36	26.9	8	120.9	3.58	2.01	1.58	0.71	37.2	26.3	UnDef	0.40
60.69	168.8	2.37	1.40	33.8	8	120.9	3.59	2.01	1.58	0.71	40.4	28.5	UnDef	0.46
60.86	185.2	2.85	1.54	34.2	8	120.9	3.60	2.02	1.59	0.70	44.4	31.2	UnDef	0.00
61.02	199.3	3.25	1.63	32.3	8	120.9	3.61	2.02	1.59	0.70	47.7	33.6	UnDef	0.00
61.19	202.1	3.30	1.63	39.9	8	120.9	3.62	2.03	1.60	0.70	48.4	34.0	UnDef	0.00
61.35	196.3	3.47	1.77	41.2	8	120.9	3.63	2.03	1.60	0.70	47.0	33.0	UnDef	0.00
61.52	189.2	3.31	1.75	33.9	8	120.9	3.64	2.04	1.61	0.70	45.3	31.8	UnDef	0.00
61.68	184.1	3.32	1.80	27.9	8	120.9	3.65	2.04	1.61	0.70	44.1	30.9	UnDef	0.00
61.84	176.7	3.12	1.76	20.0	8	120.9	3.66	2.04	1.62	0.70	42.3	29.6	UnDef	0.00
62.01	166.4	3.02	1.81	13.9	8	120.9	3.67	2.05	1.62	0.70	39.8	27.8	UnDef	0.00
62.17	156.7	2.90	1.85	16.9	7	117.8	3.68	2.05	1.63	0.70	50.0	34.9	UnDef	0.00
62.34	163.9	2.97	1.81	37.7	8	120.9	3.69	2.06	1.63	0.70	39.2	27.3	UnDef	0.00
62.50	169.4	3.05	1.80	43.3	8	120.9	3.70	2.06	1.64	0.70	40.6	28.2	UnDef	0.00
62.66	170.1	3.14	1.84	41.2	8	120.9	3.71	2.07	1.64	0.70	40.7	28.3	UnDef	0.00
62.83	171.3	3.09	1.80	39.0	8	120.9	3.72	2.07	1.65	0.69	41.0	28.5	UnDef	0.00
62.99	169.4	3.06	1.80	36.0	8	120.9	3.73	2.08	1.65	0.69	40.6	28.1	UnDef	0.00
63.16	155.1	3.00	1.93	30.1	7	117.8	3.74	2.08	1.66	0.69	49.5	34.3	UnDef	0.00
63.32	145.4	2.73	1.87	29.1	7	117.8	3.75	2.09	1.66	0.69	46.4	32.1	UnDef	0.00
63.48	147.2	2.63	1.78	32.5	8	120.9	3.76	2.09	1.67	0.69	35.3	24.4	UnDef	0.00
63.65	155.8	2.66	1.71	29.0	8	120.9	3.77	2.10	1.68	0.69	37.3	25.8	UnDef	0.00
63.81	158.7	2.80	1.76	22.0	8	120.9	3.78	2.10	1.68	0.69	38.0	26.2	UnDef	0.00
63.98	156.9	2.83	1.80	16.4	8	120.9	3.79	2.11	1.69	0.69	37.6	25.9	UnDef	0.00
64.14	155.0	2.82	1.82	14.0	8	120.9	3.80	2.11	1.69	0.69	37.1	25.5	UnDef	0.00
64.30	146.7	2.77	1.89	12.1	7	117.8	3.81	2.12	1.70	0.69	46.8	32.2	UnDef	0.00
64.47	138.1	2.65	1.92	14.8	7	117.8	3.82	2.12	1.70	0.69	44.1	30.3	UnDef	0.00
64.63	131.6	2.59	1.97	19.2	7	117.8	3.83	2.12	1.71	0.69	42.0	28.8	UnDef	0.46
64.80	124.0	2.36	1.90	26.5	7	117.8	3.84	2.13	1.71	0.69	39.6	27.1	UnDef	0.41
64.96	118.6	2.23	1.88	24.1	7	117.8	3.85	2.13	1.72	0.68	37.9	25.9	UnDef	0.39
65.12	108.1	2.16	1.99	31.3	7	117.8	3.86	2.14	1.72	0.68	34.5	23.6	UnDef	0.40
65.29	96.8	2.23	2.30	27.1	7	117.8	3.87	2.14	1.73	0.68	30.9	21.1	UnDef	0.00
65.45	93.9	2.04	2.18	24.4	7	117.8	3.88	2.15	1.73	0.68	30.0	20.5	UnDef	0.45
65.62	98.7	1.84	1.87	16.4	7	117.8	3.89	2.15	1.74	0.68	31.5	21.5	UnDef	0.35
65.78	95.0	1.10	1.16	-0.2	8	120.9	3.90	2.16	1.74	0.68	22.7	15.5	UnDef	0.21
65.94	109.0	1.01	0.93	-8.9	8	120.9	3.91	2.16	1.75	0.68	26.1	17.7	UnDef	0.20
66.11	102.6	0.97	0.95	-10.6	8	120.9	3.92	2.17	1.75	0.68	24.6	16.7	UnDef	0.19
66.27	98.7	1.02	1.04	-8.8	8	120.9	3.93	2.17	1.76	0.68	23.6	16.0	UnDef	0.20
66.44	98.4	1.19	1.21	-5.9	8	120.9	3.94	2.18	1.76	0.68	23.6	16.0	UnDef	0.22
66.60	96.7	1.41	1.46	-4.6	8	120.9	3.95	2.18	1.77	0.68	23.2	15.7	UnDef	0.26
66.76	91.8	1.88	2.05	-4.6	7	117.8	3.96	2.19	1.77	0.68	29.3	19.8	UnDef	0.41
66.93	76.2	2.26	2.96	-6.6	6	114.6	3.97	2.19	1.78	0.68	29.2	19.7	5.77	0.00
67.09	55.5	1.94	3.50	-7.6	5	114.6	3.98	2.19	1.78	0.68	26.6	17.9	4.12	0.00
67.26	50.9	1.51	2.97	-7.1	6	114.6	3.99	2.20	1.79	0.67	19.5	13.2	3.75	0.00

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
67.42	44.3	1.20	2.72	-7.4	6	114.6	4.00	2.20	1.79	0.67	17.0	11.4	3.22	0.37
67.58	36.2	0.86	2.38	-7.0	6	114.6	4.00	2.21	1.80	0.67	13.9	9.3	2.57	0.24
67.75	33.4	0.62	1.86	-5.9	6	114.6	4.01	2.21	1.80	0.67	12.8	8.6	2.35	0.20
67.91	31.3	0.45	1.44	-4.1	6	114.6	4.02	2.22	1.81	0.67	12.0	8.1	2.18	0.18
68.08	31.5	0.49	1.56	6.5	6	114.6	4.03	2.22	1.81	0.67	12.1	8.1	2.20	0.18
68.24	42.3	0.82	1.94	8.4	6	114.6	4.04	2.22	1.82	0.67	16.2	10.9	3.06	0.33
68.40	61.3	1.15	1.88	8.7	7	117.8	4.05	2.23	1.82	0.67	19.6	13.1	UnDef	0.00
68.57	93.6	1.73	1.85	19.0	7	117.8	4.06	2.23	1.83	0.67	29.9	20.0	UnDef	0.35
68.73	88.8	2.14	2.40	25.3	7	117.8	4.07	2.24	1.83	0.67	28.3	18.9	UnDef	0.00
68.90	79.9	2.35	2.94	31.5	6	114.6	4.08	2.24	1.84	0.67	30.6	20.4	6.06	0.00
69.06	70.8	2.59	3.65	32.1	5	114.6	4.09	2.25	1.84	0.67	33.9	22.6	5.33	0.00
69.22	69.4	2.74	3.94	27.4	5	114.6	4.10	2.25	1.85	0.67	33.2	22.1	5.22	0.00
69.39	90.1	2.10	2.32	21.8	7	117.8	4.11	2.25	1.85	0.67	28.8	19.2	UnDef	0.00
69.55	129.9	2.32	1.78	11.5	7	117.8	4.12	2.26	1.86	0.67	41.5	27.6	UnDef	0.41
69.72	112.2	2.69	2.39	2.8	7	117.8	4.13	2.26	1.86	0.66	35.8	23.8	UnDef	0.00
69.88	85.2	2.08	2.43	2.8	7	117.8	4.14	2.27	1.87	0.66	27.2	18.1	UnDef	0.00
70.05	96.6	1.78	1.85	3.7	7	117.8	4.15	2.27	1.87	0.66	30.8	20.5	UnDef	0.36
70.21	106.9	0.99	0.93	0.8	8	120.9	4.16	2.28	1.88	0.66	25.6	17.0	UnDef	0.20
70.37	100.2	1.43	1.43	-4.8	8	120.9	4.17	2.28	1.89	0.66	24.0	15.9	UnDef	0.26
70.54	70.4	1.61	2.29	-5.9	7	117.8	4.18	2.29	1.89	0.66	22.5	14.9	UnDef	0.00
70.70	38.2	1.05	2.76	-7.0	6	114.6	4.19	2.29	1.90	0.66	14.6	9.7	2.72	0.25
70.87	36.4	0.32	0.88	-5.1	7	117.8	4.20	2.30	1.90	0.66	11.6	7.7	UnDef	0.23
71.03	35.6	0.24	0.68	-2.9	7	117.8	4.21	2.30	1.91	0.66	11.4	7.5	UnDef	0.20
71.19	33.5	0.23	0.69	-0.8	7	117.8	4.22	2.31	1.91	0.66	10.7	7.0	UnDef	0.20
71.36	33.7	0.27	0.80	30.3	7	117.8	4.23	2.31	1.92	0.66	10.8	7.1	UnDef	0.20
71.52	34.9	0.65	1.87	35.6	6	114.6	4.23	2.31	1.92	0.66	13.4	8.8	2.45	0.21
71.69	58.3	1.22	2.10	45.1	7	117.8	4.24	2.32	1.93	0.66	18.6	12.2	UnDef	0.00
71.85	87.1	1.75	2.01	51.6	7	117.8	4.25	2.32	1.93	0.66	27.8	18.2	UnDef	0.44
72.01	122.5	1.99	1.63	31.8	8	120.9	4.26	2.33	1.94	0.66	29.3	19.2	UnDef	0.35
72.18	138.4	2.36	1.70	13.0	8	120.9	4.27	2.33	1.94	0.65	33.1	21.7	UnDef	0.41
72.34	136.3	2.40	1.76	9.2	7	117.8	4.28	2.34	1.95	0.65	43.5	28.5	UnDef	0.42
72.51	139.8	2.31	1.65	9.3	8	120.9	4.29	2.34	1.95	0.65	33.5	21.9	UnDef	0.40
72.67	147.2	2.36	1.60	13.3	8	120.9	4.30	2.35	1.96	0.65	35.2	23.0	UnDef	0.42
72.83	149.0	2.34	1.57	15.0	8	120.9	4.31	2.35	1.96	0.65	35.7	23.3	UnDef	0.41
73.00	143.3	2.28	1.59	16.0	8	120.9	4.32	2.36	1.97	0.65	34.3	22.3	UnDef	0.40
73.16	134.8	2.51	1.86	16.8	7	117.8	4.33	2.36	1.97	0.65	43.0	28.0	UnDef	0.45
73.33	120.0	2.63	2.19	18.0	7	117.8	4.34	2.37	1.98	0.65	38.3	24.9	UnDef	0.00
73.49	105.1	2.61	2.48	19.1	7	117.8	4.35	2.37	1.98	0.65	33.6	21.8	UnDef	0.00
73.65	83.7	2.37	2.83	17.8	6	114.6	4.36	2.37	1.99	0.65	32.1	20.8	6.35	0.00
73.82	68.1	1.82	2.68	11.9	6	114.6	4.37	2.38	1.99	0.65	26.1	16.9	5.10	0.00
73.98	52.5	1.47	2.80	8.7	6	114.6	4.38	2.38	2.00	0.65	20.1	13.0	3.85	0.00
74.15	39.1	1.20	3.07	8.2	5	114.6	4.39	2.39	2.00	0.65	18.7	12.1	2.78	0.26
74.31	37.8	1.05	2.78	10.1	6	114.6	4.40	2.39	2.01	0.65	14.5	9.4	2.67	0.24
74.47	42.6	1.14	2.68	12.1	6	114.6	4.41	2.40	2.01	0.65	16.3	10.6	3.06	0.31
74.64	41.8	0.87	2.09	10.8	6	114.6	4.42	2.40	2.02	0.65	16.0	10.3	2.99	0.29
74.80	33.5	0.70	2.10	17.5	6	114.6	4.43	2.40	2.02	0.64	12.8	8.3	2.32	0.19
74.97	33.1	0.78	2.36	20.6	6	114.6	4.44	2.41	2.03	0.64	12.7	8.2	2.29	0.19
75.13	43.3	1.09	2.52	23.3	6	114.6	4.45	2.41	2.03	0.64	16.6	10.7	3.11	0.32
75.29	48.1	1.35	2.81	19.6	6	114.6	4.46	2.42	2.04	0.64	18.4	11.9	3.49	0.40
75.46	42.0	1.14	2.72	17.6	6	114.6	4.47	2.42	2.04	0.64	16.1	10.3	3.00	0.29
75.62	34.5	0.84	2.44	18.6	6	114.6	4.47	2.43	2.05	0.64	13.2	8.5	2.41	0.20
75.79	41.1	0.86	2.10	21.8	6	114.6	4.48	2.43	2.05	0.64	15.7	10.1	2.93	0.28
75.95	45.7	1.16	2.55	21.6	6	114.6	4.49	2.43	2.06	0.64	17.5	11.2	3.29	0.35
76.11	44.0	1.22	2.78	20.2	6	114.6	4.50	2.44	2.06	0.64	16.9	10.8	3.16	0.32

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
76.28	50.1	1.28	2.56	20.0	6	114.6	4.51	2.44	2.07	0.64	19.2	12.3	3.65	0.44
76.44	57.0	1.28	2.25	19.7	6	114.6	4.52	2.45	2.07	0.64	21.8	14.0	4.20	0.00
76.61	47.4	1.37	2.90	21.5	6	114.6	4.53	2.45	2.08	0.64	18.2	11.6	3.43	0.38
76.77	49.5	1.38	2.79	26.8	6	114.6	4.54	2.46	2.08	0.64	19.0	12.1	3.60	0.42
76.93	58.1	1.61	2.78	26.1	6	114.6	4.55	2.46	2.09	0.64	22.3	14.2	4.29	0.00
77.10	95.2	1.67	1.76	21.6	7	117.8	4.56	2.46	2.10	0.64	30.4	19.4	UnDef	0.36
77.26	111.3	1.97	1.77	16.1	7	117.8	4.57	2.47	2.10	0.64	35.5	22.6	UnDef	0.38
77.43	110.7	2.64	2.38	15.3	7	117.8	4.58	2.47	2.11	0.64	35.3	22.5	UnDef	0.00
77.59	102.2	2.57	2.51	16.5	7	117.8	4.59	2.48	2.11	0.64	32.6	20.7	UnDef	0.00
77.75	98.7	2.54	2.57	17.2	7	117.8	4.60	2.48	2.12	0.63	31.5	20.0	UnDef	0.00
77.92	119.6	2.98	2.49	20.0	7	117.8	4.61	2.49	2.12	0.63	38.2	24.2	UnDef	0.00
78.08	119.9	3.23	2.69	18.6	7	117.8	4.62	2.49	2.13	0.63	38.3	24.2	UnDef	0.00
78.25	121.8	3.27	2.68	18.4	7	117.8	4.63	2.50	2.13	0.63	38.9	24.6	UnDef	0.00
78.41	125.5	3.24	2.58	19.1	7	117.8	4.64	2.50	2.14	0.63	40.1	25.3	UnDef	0.00
78.58	124.5	3.14	2.52	19.3	7	117.8	4.65	2.51	2.14	0.63	39.7	25.1	UnDef	0.00
78.74	116.0	3.31	2.85	17.1	6	114.6	4.66	2.51	2.15	0.63	44.4	28.0	8.90	0.00
78.90	104.1	3.33	3.20	13.3	6	114.6	4.67	2.51	2.15	0.63	39.9	25.1	7.95	0.00
79.07	90.9	2.99	3.29	9.3	6	114.6	4.67	2.52	2.16	0.63	34.8	22.0	6.90	0.00
79.23	106.4	2.79	2.62	5.0	7	117.8	4.68	2.52	2.16	0.63	34.0	21.4	UnDef	0.00
79.40	114.1	2.58	2.26	3.8	7	117.8	4.69	2.53	2.17	0.63	36.4	22.9	UnDef	0.00
79.56	120.6	2.62	2.17	2.5	7	117.8	4.70	2.53	2.17	0.63	38.5	24.2	UnDef	0.00
79.72	126.0	2.76	2.19	0.7	7	117.8	4.71	2.54	2.18	0.63	40.2	25.3	UnDef	0.00
79.89	128.8	2.79	2.16	-0.7	7	117.8	4.72	2.54	2.18	0.63	41.1	25.8	UnDef	0.00
80.05	127.3	2.80	2.20	-2.7	7	117.8	4.73	2.55	2.19	0.63	40.6	25.5	UnDef	0.00
80.22	124.4	2.72	2.18	-4.3	7	117.8	4.74	2.55	2.19	0.63	39.7	24.9	UnDef	0.00
80.38	119.4	2.82	2.36	-6.0	7	117.8	4.75	2.55	2.20	0.63	38.1	23.8	UnDef	0.00
80.54	119.0	2.55	2.14	-8.2	7	117.8	4.76	2.56	2.20	0.63	38.0	23.7	UnDef	0.00
80.71	120.4	2.55	2.11	-9.9	7	117.8	4.77	2.56	2.21	0.62	38.4	24.0	UnDef	0.00
80.87	122.7	2.29	1.86	-11.4	7	117.8	4.78	2.57	2.21	0.62	39.2	24.4	UnDef	0.44
81.04	126.0	2.32	1.84	-13.2	7	117.8	4.79	2.57	2.22	0.62	40.2	25.1	UnDef	0.44
81.20	126.6	2.36	1.86	-6.0	7	117.8	4.80	2.58	2.22	0.62	40.4	25.2	UnDef	0.45
81.36	129.4	2.39	1.84	-8.5	7	117.8	4.81	2.58	2.23	0.62	41.3	25.7	UnDef	0.45
81.53	137.6	2.31	1.68	-10.7	8	120.9	4.82	2.59	2.23	0.62	32.9	20.5	UnDef	0.42
81.69	137.2	2.44	1.78	-13.4	7	117.8	4.83	2.59	2.24	0.62	43.8	27.2	UnDef	0.45
81.86	134.7	2.39	1.77	-15.1	7	117.8	4.84	2.60	2.24	0.62	43.0	26.7	UnDef	0.44
82.02	134.7	2.25	1.67	-16.2	8	120.9	4.85	2.60	2.25	0.62	32.2	20.0	UnDef	0.41
82.18	130.8	2.16	1.65	-17.3	8	120.9	4.86	2.60	2.25	0.62	31.3	19.4	UnDef	0.39
82.35	131.0	2.18	1.66	-18.2	8	120.9	4.87	2.61	2.26	0.62	31.4	19.4	UnDef	0.40
82.51	139.7	2.02	1.45	-19.1	8	120.9	4.88	2.61	2.26	0.62	33.4	20.7	UnDef	0.36
82.68	138.3	2.43	1.75	-20.0	8	120.9	4.89	2.62	2.27	0.62	33.1	20.5	UnDef	0.44
82.84	129.1	2.90	2.24	-20.6	7	117.8	4.90	2.62	2.27	0.62	41.2	25.4	UnDef	0.00
83.00	113.8	3.61	3.17	-20.8	6	114.6	4.91	2.63	2.28	0.62	43.6	26.9	8.71	0.00
83.17	87.4	3.33	3.81	-20.7	5	114.6	4.92	2.63	2.28	0.62	41.9	25.8	6.60	0.00
83.33	73.9	2.56	3.46	-20.9	6	114.6	4.93	2.64	2.29	0.62	28.3	17.4	5.52	0.00
83.50	70.0	2.34	3.33	-20.8	6	114.6	4.94	2.64	2.29	0.62	26.8	16.5	5.21	0.00
83.66	59.9	2.28	3.80	-20.6	5	114.6	4.95	2.65	2.30	0.61	28.7	17.6	4.39	0.00
83.82	46.8	1.61	3.45	-21.1	5	114.6	4.95	2.65	2.31	0.61	22.4	13.8	3.35	0.00
83.99	39.5	1.10	2.79	-20.9	6	114.6	4.96	2.65	2.31	0.61	15.1	9.3	2.76	0.23
84.15	36.7	1.01	2.76	-20.6	6	114.6	4.97	2.66	2.32	0.61	14.1	8.6	2.54	0.20
84.32	39.8	0.97	2.44	-20.1	6	114.6	4.98	2.66	2.32	0.61	15.3	9.3	2.79	0.24
84.48	42.8	1.13	2.65	-20.0	6	114.6	4.99	2.67	2.33	0.61	16.4	10.0	3.02	0.28
84.64	42.7	1.22	2.86	-16.7	6	114.6	5.00	2.67	2.33	0.61	16.4	10.0	3.02	0.27
84.81	41.7	1.28	3.07	-15.9	5	114.6	5.01	2.68	2.34	0.61	20.0	12.2	2.94	0.26
84.97	42.8	1.22	2.86	-15.8	6	114.6	5.02	2.68	2.34	0.61	16.4	10.0	3.02	0.27

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
85.14	46.3	1.28	2.77	-14.9	6	114.6	5.03	2.68	2.35	0.61	17.7	10.8	3.30	0.33
85.30	48.4	1.35	2.80	-14.8	6	114.6	5.04	2.69	2.35	0.61	18.5	11.3	3.47	0.36
85.46	42.8	1.22	2.86	-14.8	6	114.6	5.05	2.69	2.36	0.61	16.4	10.0	3.02	0.27
85.63	38.4	1.06	2.77	-14.2	6	114.6	5.06	2.70	2.36	0.61	14.7	9.0	2.67	0.22
85.79	39.4	1.06	2.70	-13.9	6	114.6	5.07	2.70	2.37	0.61	15.1	9.2	2.75	0.23
85.96	39.9	1.15	2.89	-13.3	6	114.6	5.08	2.71	2.37	0.61	15.3	9.3	2.79	0.24
86.12	41.2	1.40	3.41	-13.0	5	114.6	5.09	2.71	2.38	0.61	19.7	12.0	2.89	0.00
86.29	54.9	1.40	2.56	-12.5	6	114.6	5.10	2.71	2.38	0.61	21.0	12.8	3.99	0.00
86.45	72.2	1.57	2.18	-12.2	7	117.8	5.11	2.72	2.39	0.61	23.1	14.0	UnDef	0.00
86.61	79.2	1.54	1.95	-12.7	7	117.8	5.11	2.72	2.39	0.61	25.3	15.3	UnDef	0.00
86.78	75.7	1.77	2.34	-12.8	7	117.8	5.12	2.73	2.40	0.61	24.2	14.6	UnDef	0.00
86.94	62.2	1.90	3.06	-13.4	6	114.6	5.13	2.73	2.40	0.61	23.8	14.4	4.57	0.00
87.11	48.8	1.47	3.02	-12.9	6	114.6	5.14	2.74	2.41	0.60	18.7	11.3	3.49	0.36
87.27	38.6	0.87	2.26	-13.1	6	114.6	5.15	2.74	2.41	0.60	14.8	8.9	2.67	0.22
87.43	34.5	0.64	1.86	-12.5	6	114.6	5.16	2.74	2.42	0.60	13.2	8.0	2.35	0.18
87.60	33.2	0.57	1.72	-11.7	6	114.6	5.17	2.75	2.42	0.60	12.7	7.7	2.24	0.17
87.76	32.1	0.58	1.81	-11.2	6	114.6	5.18	2.75	2.43	0.60	12.3	7.4	2.15	0.16
87.93	33.3	0.56	1.69	-7.7	6	114.6	5.19	2.76	2.43	0.60	12.7	7.7	2.25	0.17
88.09	32.9	0.55	1.68	-7.0	6	114.6	5.20	2.76	2.44	0.60	12.6	7.6	2.22	0.16
88.25	33.0	0.55	1.67	-6.7	6	114.6	5.21	2.77	2.44	0.60	12.6	7.6	2.22	0.16
88.42	33.0	0.57	1.73	-5.9	6	114.6	5.22	2.77	2.45	0.60	12.6	7.6	2.22	0.17
88.58	33.4	0.59	1.77	-6.0	6	114.6	5.23	2.77	2.45	0.60	12.8	7.7	2.26	0.17
88.75	33.7	0.64	1.90	-5.0	6	114.6	5.24	2.78	2.46	0.60	12.9	7.7	2.28	0.17
88.91	34.3	0.71	2.07	-4.8	6	114.6	5.25	2.78	2.46	0.60	13.1	7.9	2.32	0.17
89.07	37.7	0.81	2.16	-3.9	6	114.6	5.26	2.79	2.47	0.60	14.4	8.6	2.59	0.21
89.24	39.0	0.90	2.31	-3.4	6	114.6	5.27	2.79	2.47	0.60	14.9	8.9	2.70	0.22
89.40	39.1	0.96	2.46	-2.6	6	114.6	5.27	2.80	2.48	0.60	15.0	9.0	2.70	0.22
89.57	40.1	1.03	2.58	-2.6	6	114.6	5.28	2.80	2.48	0.60	15.3	9.2	2.78	0.23
89.73	41.9	1.11	2.65	-1.5	6	114.6	5.29	2.80	2.49	0.60	16.1	9.6	2.93	0.25
89.89	43.0	1.12	2.61	-1.3	6	114.6	5.30	2.81	2.49	0.60	16.5	9.8	3.01	0.26
90.06	42.9	1.13	2.64	-0.9	6	114.6	5.31	2.81	2.50	0.60	16.4	9.8	3.01	0.26
90.22	43.5	1.17	2.70	0.2	6	114.6	5.32	2.82	2.50	0.60	16.7	9.9	3.05	0.27
90.39	43.4	1.26	2.91	0.6	6	114.6	5.33	2.82	2.51	0.60	16.6	9.9	3.05	0.27
90.55	45.1	1.30	2.89	1.2	6	114.6	5.34	2.83	2.52	0.59	17.3	10.3	3.18	0.29
90.71	45.4	1.41	3.11	1.8	5	114.6	5.35	2.83	2.52	0.59	21.8	12.9	3.21	0.29
90.88	47.5	1.74	3.67	2.3	5	114.6	5.36	2.83	2.53	0.59	22.7	13.5	3.37	0.00
91.04	51.1	1.94	3.81	2.7	5	114.6	5.37	2.84	2.53	0.59	24.5	14.5	3.66	0.00
91.21	61.2	1.94	3.18	6.6	6	114.6	5.38	2.84	2.54	0.59	23.5	13.9	4.47	0.00
91.37	63.1	1.76	2.79	6.0	6	114.6	5.39	2.85	2.54	0.59	24.2	14.3	4.62	0.00
91.53	61.7	1.63	2.65	6.2	6	114.6	5.40	2.85	2.55	0.59	23.6	14.0	4.50	0.00
91.70	55.5	1.60	2.89	7.0	6	114.6	5.41	2.86	2.55	0.59	21.3	12.6	4.01	0.00
91.86	48.8	1.61	3.30	8.0	5	114.6	5.42	2.86	2.56	0.59	23.4	13.8	3.47	0.34
92.03	45.3	2.30	5.07	8.6	3	111.4	5.43	2.86	2.56	0.59	43.4	25.6	3.19	0.00
92.19	57.5	3.01	5.23	10.3	11	130.5	5.44	2.87	2.57	0.59	15.7	9.3	UnDef	0.00
92.35	102.6	3.25	3.16	9.5	6	114.6	5.45	2.87	2.57	0.59	39.3	23.2	7.78	0.00
92.52	146.5	3.41	2.33	3.2	7	117.8	5.45	2.88	2.58	0.59	46.8	27.6	UnDef	0.00
92.68	165.3	3.84	2.32	-0.9	7	117.8	5.46	2.88	2.58	0.59	52.8	31.1	UnDef	0.00
92.85	172.5	4.18	2.42	-2.0	7	117.8	5.47	2.89	2.59	0.59	55.1	32.4	UnDef	0.00
93.01	178.1	4.41	2.48	-2.9	7	117.8	5.48	2.89	2.59	0.59	56.9	33.4	UnDef	0.00
93.17	186.7	4.47	2.39	-3.1	7	117.8	5.49	2.90	2.60	0.59	59.6	35.0	UnDef	0.00
93.34	191.0	4.52	2.37	-4.5	7	117.8	5.50	2.90	2.60	0.59	61.0	35.8	UnDef	0.00
93.50	194.5	4.42	2.27	-5.2	7	117.8	5.51	2.91	2.61	0.59	62.1	36.4	UnDef	0.00
93.67	195.9	4.41	2.25	-6.7	7	117.8	5.52	2.91	2.61	0.59	62.5	36.7	UnDef	0.00
93.83	188.0	4.53	2.41	-8.0	7	117.8	5.53	2.91	2.62	0.59	60.0	35.2	UnDef	0.00

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
93.99	181.0	4.49	2.48	-9.1	7	117.8	5.54	2.92	2.62	0.59	57.8	33.8	UnDef	0.00
94.16	188.2	4.62	2.46	-9.5	7	117.8	5.55	2.92	2.63	0.58	60.1	35.1	UnDef	0.00
94.32	202.0	4.82	2.39	-8.2	7	117.8	5.56	2.93	2.63	0.58	64.5	37.7	UnDef	0.00
94.49	205.3	5.04	2.46	-7.7	7	117.8	5.57	2.93	2.64	0.58	65.5	38.3	UnDef	0.00
94.65	204.1	5.01	2.46	-7.5	7	117.8	5.58	2.94	2.64	0.58	65.2	38.0	UnDef	0.00
94.82	202.5	4.78	2.36	-7.5	7	117.8	5.59	2.94	2.65	0.58	64.6	37.7	UnDef	0.00
94.98	200.5	4.47	2.23	-7.6	7	117.8	5.60	2.95	2.65	0.58	64.0	37.3	UnDef	0.00
95.14	198.4	4.17	2.10	-7.6	7	117.8	5.61	2.95	2.66	0.58	63.3	36.9	UnDef	0.00
95.31	192.8	3.77	1.95	-7.7	8	120.9	5.62	2.96	2.66	0.58	46.2	26.9	UnDef	0.00
95.47	182.1	3.27	1.79	-7.4	8	120.9	5.63	2.96	2.67	0.58	43.6	25.3	UnDef	0.00
95.64	170.9	2.77	1.62	-7.1	8	120.9	5.64	2.97	2.67	0.58	40.9	23.8	UnDef	0.00
95.80	156.6	2.35	1.50	-7.1	8	120.9	5.65	2.97	2.68	0.58	37.5	21.8	UnDef	0.43
95.96	141.1	2.23	1.58	-6.5	8	120.9	5.66	2.97	2.68	0.58	33.8	19.6	UnDef	0.42
96.13	123.9	2.20	1.77	-5.4	7	117.8	5.67	2.98	2.69	0.58	39.6	22.9	UnDef	0.00
96.29	117.6	1.98	1.69	-2.0	7	117.8	5.68	2.98	2.69	0.58	37.5	21.7	UnDef	0.43
96.46	124.7	1.65	1.33	-7.3	8	120.9	5.69	2.99	2.70	0.58	29.9	17.3	UnDef	0.31
96.62	113.9	2.08	1.82	-10.3	7	117.8	5.70	2.99	2.70	0.58	36.4	21.0	UnDef	0.00
96.78	93.6	2.40	2.56	-11.7	6	114.6	5.71	3.00	2.71	0.58	35.8	20.7	7.03	0.00
96.95	66.6	2.30	3.45	-12.4	5	114.6	5.72	3.00	2.71	0.58	31.9	18.4	4.87	0.00
97.11	56.2	1.51	2.69	-13.0	6	114.6	5.73	3.01	2.72	0.58	21.5	12.4	4.04	0.45
97.28	46.6	1.17	2.52	-11.7	6	114.6	5.74	3.01	2.72	0.58	17.9	10.3	3.27	0.29
97.44	40.8	1.33	3.27	-10.8	5	114.6	5.74	3.01	2.73	0.58	19.6	11.3	2.81	0.00
97.60	46.1	1.13	2.46	4.8	6	114.6	5.75	3.02	2.74	0.58	17.7	10.2	3.23	0.28
97.77	42.9	1.02	2.38	6.0	6	114.6	5.76	3.02	2.74	0.58	16.4	9.5	2.97	0.24
97.93	41.3	0.92	2.23	8.2	6	114.6	5.77	3.03	2.75	0.57	15.8	9.1	2.85	0.23
98.10	41.6	0.88	2.12	9.9	6	114.6	5.78	3.03	2.75	0.57	15.9	9.1	2.86	0.23
98.26	39.9	0.72	1.81	11.7	6	114.6	5.79	3.04	2.76	0.57	15.3	8.8	2.73	0.21
98.42	36.8	0.56	1.52	13.5	7	117.8	5.80	3.04	2.76	0.57	11.8	6.7	UnDef	0.18
98.59	35.9	0.58	1.62	16.0	6	114.6	5.81	3.04	2.77	0.57	13.7	7.9	2.41	0.17
98.75	34.9	0.62	1.78	18.0	6	114.6	5.82	3.05	2.77	0.57	13.4	7.7	2.32	0.17
98.92	36.4	0.64	1.76	21.7	6	114.6	5.83	3.05	2.78	0.57	13.9	8.0	2.44	0.18
99.08	35.4	0.60	1.70	23.7	6	114.6	5.84	3.06	2.78	0.57	13.6	7.8	2.37	0.17
99.24	35.7	0.59	1.66	26.5	6	114.6	5.85	3.06	2.79	0.57	13.7	7.8	2.39	0.17
99.41	37.7	0.65	1.73	29.1	6	114.6	5.86	3.07	2.79	0.57	14.4	8.2	2.55	0.19
99.57	38.4	0.72	1.88	31.9	6	114.6	5.87	3.07	2.80	0.57	14.7	8.4	2.60	0.19
99.74	39.5	0.77	1.96	35.0	6	114.6	5.88	3.07	2.80	0.57	15.1	8.6	2.69	0.20
99.90	41.5	0.88	2.12	38.4	6	114.6	5.89	3.08	2.81	0.57	15.9	9.1	2.85	0.22
100.06	42.9	1.02	2.38	40.7	6	114.6	5.90	3.08	2.81	0.57	16.4	9.4	2.96	0.24
100.23	45.8	1.62	3.55	44.5	5	114.6	5.90	3.09	2.82	0.57	21.9	12.5	3.19	0.00
100.39	55.5	2.27	4.09	46.8	5	114.6	5.91	3.09	2.82	0.57	26.6	15.1	3.96	0.00
100.56	61.4	2.09	3.40	45.0	5	114.6	5.92	3.10	2.83	0.57	29.4	16.7	4.44	0.00
100.72	65.4	2.62	4.00	43.7	5	114.6	5.93	3.10	2.83	0.57	31.3	17.8	4.76	0.00
100.88	62.2	2.57	4.12	72.5	5	114.6	5.94	3.10	2.84	0.57	29.8	16.9	4.50	0.00
101.05	63.2	2.30	3.63	73.9	5	114.6	5.95	3.11	2.84	0.57	30.2	17.2	4.58	0.00
101.21	57.2	1.42	2.49	69.9	6	114.6	5.96	3.11	2.85	0.57	21.9	12.4	4.10	0.45
101.38	44.7	0.70	1.57	70.7	7	117.8	5.97	3.12	2.85	0.57	14.3	8.1	UnDef	0.26
101.54	37.9	0.48	1.27	75.5	7	117.8	5.98	3.12	2.86	0.57	12.1	6.8	UnDef	0.19
101.70	32.9	0.48	1.46	80.2	6	114.6	5.99	3.13	2.86	0.57	12.6	7.1	2.15	0.15
101.87	34.4	0.58	1.69	87.4	6	114.6	6.00	3.13	2.87	0.57	13.2	7.4	2.27	0.16
102.03	37.8	0.75	1.99	105.0	6	114.6	6.01	3.14	2.87	0.56	14.5	8.2	2.55	0.19
102.20	39.1	0.92	2.36	112.0	6	114.6	6.02	3.14	2.88	0.56	15.0	8.5	2.65	0.20
102.36	43.7	1.07	2.46	118.7	6	114.6	6.03	3.14	2.88	0.56	16.7	9.4	3.01	0.24
102.53	45.1	1.20	2.67	121.1	6	114.6	6.04	3.15	2.89	0.56	17.3	9.7	3.12	0.26
102.69	48.5	1.29	2.67	124.8	6	114.6	6.05	3.15	2.89	0.56	18.6	10.5	3.39	0.30

Gregg In Situ, Inc.
Run No: 98-0720-1458-2827
CPT File: 124C01.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60	(N1)60 (blows/ft)	Su (tsf)	CRR
102.85	46.0	1.23	2.68	129.0	6	114.6	6.06	3.16	2.90	0.56	17.6	9.9	3.19	0.27
103.02	43.4	1.47	3.39	147.9	5	114.6	6.07	3.16	2.90	0.56	20.8	11.7	2.99	0.00
103.18	51.7	2.51	4.85	156.2	4	114.6	6.07	3.17	2.91	0.56	33.0	18.6	3.65	0.00
103.35	58.3	3.05	5.22	124.3	11	130.5	6.08	3.17	2.91	0.56	16.0	9.0	UnDef	0.00
103.51	52.6	2.85	5.41	85.4	11	130.5	6.10	3.18	2.92	0.56	14.4	8.1	UnDef	0.00
103.67	58.0	3.47	5.98	111.7	11	130.5	6.11	3.18	2.92	0.56	15.9	8.9	UnDef	0.00
103.84	92.6	4.74	5.12	129.7	11	130.5	6.12	3.19	2.93	0.56	25.3	14.2	UnDef	0.00
104.00	128.6	4.55	3.54	87.3	6	114.6	6.13	3.19	2.93	0.56	49.2	27.6	9.79	0.00
104.17	113.9	4.13	3.63	45.9	6	114.6	6.14	3.20	2.94	0.56	43.6	24.4	8.62	0.00
104.33	83.5	3.88	4.65	45.0	11	130.5	6.15	3.20	2.95	0.56	22.8	12.8	UnDef	0.00
104.49	84.9	3.72	4.38	47.0	11	130.5	6.16	3.21	2.95	0.56	23.2	13.0	UnDef	0.00
104.66	83.6	3.37	4.03	-7.2	5	114.6	6.17	3.21	2.96	0.56	40.0	22.3	6.19	0.00
104.82	67.1	2.59	3.85	-6.5	5	114.6	6.18	3.22	2.96	0.56	32.1	17.9	4.88	0.00
104.99	59.9	2.28	3.80	-5.6	5	114.6	6.19	3.22	2.97	0.56	28.7	16.0	4.30	0.00
105.15	58.6	2.51	4.28	-5.1	5	114.6	6.20	3.22	2.97	0.56	28.0	15.6	4.19	0.00
105.31	64.1	4.70	7.34	-4.2	11	130.5	6.21	3.23	2.98	0.56	17.5	9.8	UnDef	0.00
105.48	70.2	5.32	7.59	-3.8	11	130.5	6.22	3.23	2.98	0.56	19.2	10.7	UnDef	0.00
105.64	261.5	5.51	2.11	-4.6	8	120.9	6.23	3.24	2.99	0.56	62.6	34.8	UnDef	0.00
105.81	354.1	5.51	1.56	-26.8	8	120.9	6.24	3.24	2.99	0.56	84.8	47.1	UnDef	0.00

Gregg In Situ, Inc. Page: 1b
Interpretation Output - Release 1.00.17
Run No: 98-0720-1458-2827
Job No: 98-124
Client: NINYO & MOORE
Project: DEL MAR CA.
Site: GE
Location: CPT-1
Cone: ERIK OLSEN
CPT Date: 98/15/07
CPT Time: 09:35
CPT File: 124C01.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.05 (ft): 10.0
Su Nkt used: 12.50
Averaging Increment (m): 0.0 (Every Data Point)
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
0.16	5.0E-02	0.00	1000.0	0.18	10	175.6	0.0	175.6	0.0	50	95.0	1.0	-0.24	0.0	35.
0.33	5.0E-02	0.00	1000.0	0.28	10	284.8	0.0	284.8	0.0	50	95.0	1.0	-0.28	0.0	57.
0.49	5.0E-03	0.00	1000.0	1.10	9	234.8	0.0	234.8	0.9	50	95.0	1.0	-0.42	0.0	58.
0.66	5.0E-03	0.00	1000.0	1.47	12	173.6	UnDef	UnDef	0.0	50	95.0	1.0	-0.46	UnDef	UnDe
0.82	5.0E-04	0.00	1000.0	2.02	12	110.1	UnDef	UnDef	0.0	50	93.7	1.0	-0.52	UnDef	UnDe
0.98	5.0E-05	0.00	627.3	2.09	12	71.8	UnDef	UnDef	0.0	50	78.9	10.0	-0.47	UnDef	UnDe
1.15	5.0E-05	0.00	438.7	2.28	12	58.1	UnDef	UnDef	0.0	48	70.8	10.0	-0.45	UnDef	UnDe
1.31	5.0E-05	0.00	405.6	1.86	9	61.1	2.6	63.7	6.5	48	70.4	10.0	-0.40	0.6	25.
1.48	5.0E-04	0.00	323.2	0.67	9	54.6	0.0	54.6	1.8	48	65.5	1.0	-0.26	0.0	18.
1.64	5.0E-05	0.00	220.0	0.79	9	41.3	0.0	41.3	4.2	46	56.0	10.0	-0.24	0.0	16.
1.80	5.0E-05	-0.01	153.0	0.67	9	31.5	0.3	31.8	5.4	44	47.0	10.0	-0.19	0.1	12.
1.97	5.0E-05	-0.01	133.6	0.77	9	30.0	1.6	31.6	6.9	44	44.3	10.0	-0.19	0.4	12.
2.13	5.0E-05	-0.01	117.8	1.22	9	28.6	5.2	33.8	10.7	42	41.9	10.0	-0.22	1.2	12.
2.30	5.0E-05	-0.01	104.2	1.50	9	27.2	7.8	35.0	13.3	42	39.4	10.0	-0.23	1.8	12.
2.46	5.0E-05	-0.01	90.2	1.00	9	25.3	5.3	30.6	11.5	42	36.3	10.0	-0.18	1.2	11.
2.62	5.0E-05	-0.01	80.0	0.98	9	23.9	5.9	29.8	12.4	42	33.8	10.0	-0.17	1.3	10.
2.79	5.0E-06	-0.01	72.4	1.53	7	23.0	10.7	33.7	16.9	UnDef	UnDef	10.0	UnDef	2.9	14.
2.95	5.0E-06	-0.01	70.2	1.90	7	23.5	14.6	38.1	19.3	UnDef	UnDef	10.0	UnDef	3.7	15.
3.12	5.0E-06	-0.01	69.8	1.58	7	24.7	12.5	37.2	17.6	UnDef	UnDef	10.0	UnDef	3.3	15.
3.28	5.0E-05	-0.01	75.7	1.04	9	28.1	8.1	36.2	13.4	40	35.3	10.0	-0.17	1.8	13.
3.44	5.0E-05	-0.01	68.9	1.16	7	26.9	9.9	36.8	15.1	40	33.4	10.0	-0.17	2.2	12.
3.61	5.0E-05	-0.01	61.9	1.23	7	25.3	11.5	36.9	16.7	40	31.0	10.0	-0.16	2.5	12.
3.77	5.0E-05	-0.01	56.5	1.13	7	24.2	11.4	35.6	17.0	40	30.0	10.0	-0.15	2.4	12.
3.94	5.0E-05	-0.01	51.9	1.27	7	23.2	13.7	36.9	18.9	38	30.0	10.0	-0.15	2.8	12.
4.10	5.0E-06	-0.02	43.0	1.66	7	20.1	20.3	40.4	23.8	UnDef	UnDef	6.0	UnDef	4.6	14.
4.27	5.0E-06	-0.02	38.1	2.02	7	18.6	28.1	46.7	27.6	UnDef	UnDef	6.0	UnDef	5.6	14.
4.43	5.0E-06	-0.02	29.8	1.83	7	15.2	30.6	45.8	30.0	UnDef	UnDef	6.0	UnDef	5.4	12.
4.59	5.0E-06	-0.02	27.8	2.03	6	14.6	39.4	54.0	32.4	UnDef	UnDef	6.0	UnDef	6.0	13.
4.76	5.0E-06	-0.02	27.3	1.73	7	14.6	32.2	46.7	30.8	UnDef	UnDef	6.0	UnDef	5.4	12.
4.92	5.0E-06	-0.02	31.0	1.59	7	16.7	26.3	43.0	27.9	UnDef	UnDef	6.0	UnDef	5.1	13.
5.09	5.0E-04	-0.01	73.1	0.51	9	39.4	5.2	44.6	9.3	40	40.6	1.0	-0.10	1.0	13.
5.25	5.0E-04	0.00	118.3	0.39	9	64.4	0.0	64.4	4.6	42	54.7	1.0	-0.12	0.0	21.

Gregg In Situ, Inc.
Run No: 98-0720-1458-2827
CPT File: 124C01.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
5.41	5.0E-04	0.00	122.2	0.73	9	67.6	4.3	71.9	7.2	42	56.1	1.0	-0.18	0.9	22.
5.58	5.0E-04	0.00	134.9	0.87	9	75.7	5.5	81.2	7.5	44	59.3	1.0	-0.20	1.1	25.
5.74	5.0E-04	0.00	153.9	0.76	9	87.6	2.3	89.8	5.9	44	63.5	1.0	-0.20	0.5	29.
5.91	5.0E-03	0.00	159.8	0.82	9	92.2	2.9	95.1	6.1	44	64.9	1.0	-0.21	0.4	23.
6.07	5.0E-04	0.00	155.1	0.86	9	90.8	4.0	94.7	6.6	44	64.5	1.0	-0.21	0.8	30.
6.23	5.0E-04	0.00	149.6	0.90	9	88.8	5.2	94.0	7.1	44	63.9	1.0	-0.22	1.0	30.
6.40	5.0E-04	0.00	143.2	0.94	9	86.1	6.4	92.5	7.6	44	63.0	1.0	-0.22	1.3	29.
6.56	5.0E-04	0.00	136.3	0.96	9	83.1	7.4	90.5	8.1	44	62.0	1.0	-0.21	1.5	28.
6.73	5.0E-04	0.00	126.6	0.97	9	78.2	8.4	86.6	8.6	44	60.2	1.0	-0.21	1.6	27.
6.89	5.0E-04	0.00	115.3	0.95	9	72.1	9.1	81.3	9.2	42	57.9	1.0	-0.20	1.8	25.
7.05	5.0E-04	0.00	104.3	1.01	9	66.1	11.0	77.1	10.3	42	55.4	1.0	-0.19	2.1	23.
7.22	5.0E-04	-0.01	87.9	1.22	9	56.4	15.8	72.2	13.2	42	50.9	1.0	-0.19	2.9	21.
7.38	5.0E-04	-0.01	86.8	1.10	9	56.4	14.2	70.5	12.5	42	50.8	1.0	-0.18	2.6	21.
7.55	5.0E-04	0.00	84.6	0.83	9	55.6	10.3	65.9	10.9	42	50.4	1.0	-0.16	2.0	20.
7.71	5.0E-04	0.00	82.3	0.79	9	54.7	9.8	64.5	10.7	42	50.0	1.0	-0.15	1.9	19.
7.87	5.0E-04	0.00	79.9	0.85	9	53.6	11.2	64.8	11.5	42	49.4	1.0	-0.15	2.1	19.
8.04	5.0E-04	0.00	79.0	0.84	9	53.6	11.2	64.8	11.5	42	49.4	1.0	-0.15	2.1	19.
8.20	5.0E-04	0.00	73.7	0.62	9	50.6	8.4	59.0	10.3	40	47.7	1.0	-0.12	1.6	18.
8.37	5.0E-04	0.00	66.3	0.71	9	46.0	10.7	56.7	12.1	40	45.0	1.0	-0.12	2.0	17.
8.53	5.0E-04	0.00	61.6	0.72	9	43.3	11.4	54.7	12.8	40	43.3	1.0	-0.11	2.1	16.
8.69	5.0E-04	0.00	58.4	0.74	9	41.4	12.3	53.7	13.6	40	42.0	1.0	-0.11	2.3	15.
8.86	5.0E-04	0.00	56.0	0.69	9	40.2	11.9	52.0	13.5	40	41.1	1.0	-0.10	2.2	15.
9.02	5.0E-04	0.00	54.1	0.74	9	39.2	13.0	52.1	14.3	40	40.4	1.0	-0.10	2.4	15.
9.19	5.0E-04	0.00	53.1	0.74	9	38.8	13.2	52.0	14.5	40	40.1	1.0	-0.10	2.4	15.
9.35	5.0E-04	0.00	53.4	0.72	9	39.4	13.0	52.4	14.3	40	40.5	1.0	-0.10	2.4	15.
9.51	5.0E-04	0.00	51.5	0.77	9	38.3	14.2	52.5	15.1	38	39.8	1.0	-0.10	2.5	15.
9.68	5.0E-04	0.00	51.8	0.75	9	38.8	14.0	52.9	14.9	38	40.2	1.0	-0.10	2.5	15.
9.84	5.0E-04	0.00	52.7	0.73	9	39.8	13.6	53.4	14.5	38	40.9	1.0	-0.10	2.5	15.
10.01	5.0E-04	0.00	48.4	0.85	7	37.0	16.4	53.4	16.5	38	38.8	1.0	-0.11	2.9	14.
10.17	5.0E-04	0.00	45.9	0.93	7	35.3	18.2	53.5	17.8	38	37.4	1.0	-0.11	3.1	14.
10.33	5.0E-04	0.00	44.5	0.91	7	34.3	18.2	52.6	18.0	38	36.6	1.0	-0.10	3.1	14.
10.50	5.0E-04	0.00	45.2	0.82	7	35.0	16.5	51.5	17.0	38	37.2	1.0	-0.10	2.9	14.
10.66	5.0E-04	0.00	45.5	0.77	7	35.3	15.7	51.0	16.5	38	37.4	1.0	-0.09	2.7	14.
10.83	5.0E-04	0.00	44.1	0.79	7	34.4	16.3	50.7	17.0	38	36.7	1.0	-0.09	2.8	14.
10.99	5.0E-04	0.00	46.6	0.70	7	36.5	14.4	50.9	15.6	38	38.4	1.0	-0.09	2.6	14.
11.15	5.0E-04	0.00	47.8	0.75	7	37.5	15.1	52.7	15.8	38	39.2	1.0	-0.09	2.7	14.
11.32	5.0E-04	0.00	59.5	0.71	9	46.7	12.8	59.5	13.1	40	45.5	1.0	-0.11	2.4	17.
11.48	5.0E-04	0.00	77.1	0.71	9	60.5	10.7	71.2	10.6	40	52.9	1.0	-0.13	2.1	21.
11.65	5.0E-03	0.00	109.8	0.65	9	86.2	5.8	92.0	7.4	42	63.0	1.0	-0.16	0.9	22.
11.81	5.0E-02	0.00	209.2	0.68	9	164.0	0.0	164.0	3.7	46	81.5	1.0	-0.22	0.0	32.
11.97	5.0E-02	0.00	306.9	0.81	9	241.2	0.0	241.2	2.8	46	92.5	1.0	-0.27	0.0	47.
12.14	5.0E-02	0.00	365.6	0.95	9	288.3	0.0	288.3	2.9	48	95.0	1.0	-0.30	0.0	56.
12.30	5.0E-02	0.00	401.7	1.09	9	317.9	0.0	317.9	3.2	48	95.0	1.0	-0.33	0.0	62.
12.47	5.0E-02	0.00	413.1	1.27	9	328.2	0.0	328.2	4.0	48	95.0	1.0	-0.35	0.0	64.
12.63	5.0E-03	0.00	409.4	1.43	9	326.5	0.0	326.5	4.7	48	95.0	1.0	-0.36	0.0	79.
12.80	5.0E-03	0.00	421.6	1.52	9	337.4	0.0	337.4	5.0	48	95.0	1.0	-0.38	0.0	82.
12.96	5.0E-03	0.00	439.8	1.62	9	353.2	2.2	355.4	5.2	48	95.0	1.0	-0.39	0.3	86.
13.12	5.0E-03	0.00	444.6	1.71	9	358.3	5.4	363.8	5.6	48	95.0	1.0	-0.40	0.8	88.
13.29	5.0E-03	0.00	440.8	1.74	9	356.6	6.7	363.3	5.7	48	95.0	1.0	-0.40	1.0	88.
13.45	5.0E-03	0.00	431.8	1.85	9	350.5	11.6	362.1	6.2	48	95.0	1.0	-0.41	1.8	87.
13.62	5.0E-03	0.00	415.3	1.82	9	338.4	11.8	350.2	6.3	48	95.0	1.0	-0.40	1.8	84.
13.78	5.0E-03	0.00	383.5	1.68	9	313.6	8.7	322.4	6.0	48	95.0	1.0	-0.38	1.3	78.
13.94	5.0E-03	0.00	357.5	1.57	9	293.4	7.0	300.4	5.9	48	95.0	1.0	-0.36	1.1	72.
14.11	5.0E-03	0.00	333.4	1.29	9	274.6	0.0	274.6	4.9	48	95.0	1.0	-0.33	0.0	67.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
14.27	5.0E-03	0.00	297.0	1.29	9	245.6	2.8	248.4	5.4	46	93.0	1.0	-0.32	0.4	60.
14.44	5.0E-03	0.00	241.2	1.16	9	200.3	4.4	204.7	5.8	46	87.2	1.0	-0.29	0.7	49.
14.60	5.0E-02	0.00	223.1	0.93	9	186.0	0.0	186.0	4.9	46	85.1	1.0	-0.26	0.0	36.
14.76	5.0E-02	0.00	210.7	0.84	9	176.4	0.0	176.4	4.7	46	83.5	1.0	-0.24	0.0	34.
14.93	5.0E-02	0.00	178.1	0.83	9	149.8	2.3	152.1	5.6	44	78.9	1.0	-0.22	0.3	29.
15.09	5.0E-02	0.00	167.1	0.72	9	141.1	0.6	141.7	5.2	44	77.1	1.0	-0.21	0.1	27.
15.26	5.0E-02	0.00	201.3	0.59	9	170.3	0.0	170.3	3.3	46	82.5	1.0	-0.20	0.0	33.
15.42	5.0E-02	0.00	216.1	0.64	9	183.4	0.0	183.4	3.3	46	84.7	1.0	-0.22	0.0	35.
15.58	5.0E-02	0.00	213.1	0.77	9	181.5	0.0	181.5	4.2	46	84.4	1.0	-0.23	0.0	35.
15.75	5.0E-02	0.00	208.0	0.92	9	177.8	1.2	178.9	5.2	46	83.8	1.0	-0.25	0.1	34.
15.91	5.0E-02	0.00	199.2	0.98	9	170.8	3.9	174.8	5.8	46	82.6	1.0	-0.25	0.5	33.
16.08	5.0E-02	0.00	190.0	1.01	9	163.6	5.7	169.3	6.3	44	81.4	1.0	-0.25	0.7	32.
16.24	5.0E-02	0.00	180.0	0.93	9	155.5	4.7	160.2	6.1	44	79.9	1.0	-0.24	0.6	31.
16.40	5.0E-02	0.00	170.6	0.84	9	147.9	3.3	151.2	5.8	44	78.5	1.0	-0.22	0.4	29.
16.57	5.0E-02	0.00	165.6	0.78	9	144.1	2.6	146.8	5.7	44	77.8	1.0	-0.21	0.3	28.
16.73	5.0E-02	0.00	150.3	0.77	9	131.4	4.3	135.6	6.2	44	75.1	1.0	-0.20	0.5	26.
16.90	5.0E-03	0.00	127.1	0.76	9	111.6	6.9	118.5	7.2	44	70.4	1.0	-0.18	1.0	28.
17.06	5.0E-03	0.00	103.1	0.70	9	91.0	8.5	99.5	8.2	42	64.6	1.0	-0.16	1.3	23.
17.22	5.0E-03	0.00	85.1	0.58	9	75.5	8.2	83.8	8.7	42	59.2	1.0	-0.12	1.2	19.
17.39	5.0E-04	0.00	80.6	1.56	7	71.8	30.1	101.9	16.1	42	57.8	1.0	-0.21	5.3	28.
17.55	5.0E-06	0.00	90.1	4.15	11	80.4	UnDef	UnDef	0.0	UnDef	UnDef	10.0	UnDef	UnDef	UnDe
17.72	5.0E-04	0.00	153.1	2.72	7	136.2	54.1	190.3	15.6	44	76.1	1.0	-0.37	9.6	54.
17.88	5.0E-02	0.00	299.2	0.88	9	265.7	0.0	265.7	3.3	46	95.0	1.0	-0.28	0.0	52.
18.04	5.0E-04	0.00	224.2	1.99	9	200.0	31.3	231.3	10.1	46	87.1	1.0	-0.35	6.0	71.
18.21	1.0E-15	0.00	123.2	10.00	11	110.8	UnDef	UnDef	0.0	42	70.2	1.0	2.35	UnDef	UnDe
18.37	1.0E-15	0.00	213.4	6.71	11	191.7	UnDef	UnDef	0.0	46	85.9	1.0	-1.25	UnDef	UnDe
18.54	1.0E-15	0.00	226.6	4.34	12	204.2	UnDef	UnDef	0.0	46	87.7	1.0	-0.59	UnDef	UnDe
18.70	5.0E-03	0.00	342.1	1.97	9	308.5	24.2	332.7	7.7	48	95.0	1.0	-0.40	3.6	79.
18.86	5.0E-04	0.00	192.8	3.02	12	174.9	UnDef	UnDef	0.0	44	83.3	1.0	-0.42	UnDef	UnDe
19.03	5.0E-02	0.00	225.4	0.90	9	204.9	0.0	204.9	4.7	46	87.8	1.0	-0.25	0.0	40.
19.19	5.0E-03	0.00	153.7	1.10	9	140.5	12.6	153.1	8.1	44	77.0	1.0	-0.24	1.9	36.
19.36	5.0E-05	0.00	106.4	3.40	7	97.9	76.3	174.1	21.4	42	66.7	10.0	-0.38	14.5	52.
19.52	5.0E-05	0.00	113.1	3.60	12	104.2	UnDef	UnDef	0.0	42	68.5	10.0	-0.40	UnDef	UnDe
19.68	5.0E-03	0.00	113.0	1.51	9	104.4	27.0	131.4	12.7	42	68.5	1.0	-0.24	3.8	29.
19.85	5.0E-03	0.00	103.5	1.02	9	96.0	16.5	112.5	10.5	42	66.1	1.0	-0.19	2.4	25.
20.01	5.0E-02	0.00	125.1	0.64	9	116.1	4.4	120.5	6.4	44	71.5	1.0	-0.17	0.5	23.
20.18	5.0E-03	-0.01	106.5	0.65	9	99.3	7.3	106.6	7.6	42	67.1	1.0	-0.16	1.1	25.
20.34	5.0E-03	-0.01	93.8	0.59	9	87.9	7.7	95.6	8.0	42	63.6	1.0	-0.14	1.1	22.
20.51	5.0E-03	-0.01	71.4	0.75	9	67.4	14.7	82.1	11.7	40	56.0	1.0	-0.13	2.1	18.
20.67	5.0E-04	-0.01	48.3	1.61	7	46.1	38.5	84.6	22.0	38	45.1	1.0	-0.16	6.0	21.
20.83	5.0E-04	-0.01	40.0	1.27	7	38.5	32.6	71.1	22.2	38	39.9	1.0	-0.12	5.0	17.
21.00	5.0E-03	0.00	61.8	0.48	9	58.9	0.0	58.9	5.0	40	52.1	1.0	-0.08	0.0	14.
21.16	5.0E-03	-0.01	57.9	0.44	9	55.4	0.0	55.4	5.0	40	50.4	1.0	-0.07	0.0	13.
21.33	5.0E-03	-0.01	50.1	0.52	9	48.3	13.2	61.5	13.0	38	46.4	1.0	-0.07	1.8	13.
21.49	5.0E-04	-0.01	38.1	1.00	7	37.1	26.7	63.8	20.7	38	38.9	1.0	-0.10	4.3	16.
21.65	5.0E-05	-0.02	25.6	1.10	7	25.4	36.6	62.0	27.1	34	30.0	6.0	-0.07	5.8	15.
21.82	5.0E-04	0.00	21.1	0.61	7	21.3	24.8	46.1	25.2	34	30.0	1.0	0.00	3.5	10.
21.98	5.0E-04	0.03	21.0	0.51	7	21.2	21.9	43.1	24.0	34	30.0	1.0	0.01	3.2	10.
22.15	5.0E-04	0.04	20.8	0.51	7	21.0	22.2	43.2	24.2	34	30.0	1.0	0.01	3.2	10.
22.31	5.0E-04	0.04	21.0	0.56	7	21.3	23.5	44.7	24.6	34	30.0	1.0	0.01	3.4	10.
22.47	5.0E-05	0.05	20.0	0.63	7	20.5	26.9	47.3	26.3	34	30.0	6.0	0.00	4.4	12.
22.64	5.0E-05	0.06	19.2	0.71	7	19.7	31.0	50.7	27.9	32	30.0	6.0	0.00	4.8	12.
22.80	5.0E-05	0.07	19.0	0.72	7	19.6	31.4	51.0	28.1	32	30.0	6.0	0.00	4.8	12.
22.97	5.0E-05	0.07	18.7	0.67	7	19.3	30.1	49.4	27.8	32	30.0	6.0	0.01	4.7	12.

Gregg In Situ, Inc.

Run No: 98-0720-1458-2827

CPT File: 124C01.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
23.13	5.0E-04	0.07	18.7	0.33	7	19.4	0.0	19.4	5.0	32	30.0	1.0	0.06	0.0	6.
23.29	5.0E-04	0.07	24.0	0.34	7	24.5	0.0	24.5	5.0	34	30.0	1.0	0.03	0.0	8.
23.46	5.0E-03	0.01	38.3	0.24	9	38.4	0.0	38.4	5.0	38	39.9	1.0	0.02	0.0	9.
23.62	5.0E-03	0.00	51.5	0.26	9	51.3	0.0	51.3	5.0	38	48.1	1.0	-0.02	0.0	12.
23.79	5.0E-03	0.00	62.5	0.34	9	62.2	0.0	62.2	5.0	40	53.7	1.0	-0.05	0.0	15.
23.95	5.0E-03	0.00	56.5	0.81	9	56.5	19.1	75.5	14.5	40	50.9	1.0	-0.12	2.6	16.
24.11	5.0E-04	0.00	37.1	1.57	7	37.7	44.2	81.8	25.2	38	39.3	1.0	-0.13	6.3	18.
24.28	5.0E-05	0.00	29.6	1.76	7	30.4	58.9	89.3	29.7	36	33.2	6.0	-0.12	8.4	20.
24.44	5.0E-04	0.01	31.3	1.25	7	32.1	38.1	70.1	25.3	36	34.7	1.0	-0.09	5.4	15.
24.61	5.0E-03	0.00	57.3	0.57	9	57.7	13.7	71.4	12.2	40	51.5	1.0	-0.09	1.9	16.
24.77	5.0E-03	0.00	72.2	0.41	9	72.6	0.0	72.6	5.0	40	58.1	1.0	-0.08	0.0	17.
24.93	5.0E-03	0.00	69.1	0.44	9	69.7	0.0	69.7	5.0	40	56.9	1.0	-0.08	0.0	17.
25.10	5.0E-03	0.00	62.4	0.71	9	63.3	16.1	79.3	12.6	40	54.1	1.0	-0.11	2.2	17.
25.26	5.0E-03	0.00	70.0	0.29	9	70.9	0.0	70.9	5.0	40	57.4	1.0	-0.05	0.0	17.
25.43	5.0E-03	-0.01	78.4	0.35	9	79.4	0.0	79.4	5.0	42	60.7	1.0	-0.08	0.0	19.
25.59	5.0E-03	-0.01	49.7	0.60	9	51.1	16.0	67.0	13.9	38	48.0	1.0	-0.08	2.2	14.
25.75	5.0E-03	-0.01	47.5	0.65	9	48.9	17.6	66.5	14.9	38	46.8	1.0	-0.08	2.4	14.
25.92	5.0E-04	-0.01	45.2	0.70	7	46.7	19.3	66.0	15.9	38	45.4	1.0	-0.08	3.4	18.
26.08	5.0E-04	-0.01	44.3	0.69	7	45.9	19.3	65.2	16.1	38	45.0	1.0	-0.08	3.4	18.
26.25	5.0E-04	-0.02	42.1	0.72	7	43.8	20.6	64.4	17.0	38	43.6	1.0	-0.08	3.6	17.
26.41	5.0E-04	-0.02	38.8	0.80	7	40.6	23.5	64.1	18.7	38	41.4	1.0	-0.08	3.9	17.
26.57	5.0E-04	-0.02	35.0	0.78	7	36.8	24.1	60.9	19.8	38	38.6	1.0	-0.07	4.0	16.
26.74	5.0E-04	-0.03	33.4	0.67	7	35.4	21.9	57.3	19.3	36	37.5	1.0	-0.05	3.6	15.
26.90	5.0E-04	-0.03	30.0	0.75	7	31.9	25.3	57.2	21.6	36	34.5	1.0	-0.05	4.0	14.
27.07	5.0E-04	-0.03	25.9	0.83	7	27.8	30.0	57.8	24.4	34	30.6	1.0	-0.05	4.4	13.
27.23	5.0E-04	-0.04	24.1	0.69	7	26.1	27.1	53.2	24.1	34	30.0	1.0	-0.03	4.0	12.
27.39	5.0E-04	-0.04	22.5	0.53	7	24.5	23.3	47.8	23.3	34	30.0	1.0	0.00	3.5	11.
27.56	5.0E-04	-0.04	20.5	0.27	7	22.5	0.0	22.5	5.0	34	30.0	1.0	0.06	0.0	7.
27.72	5.0E-04	-0.03	23.0	0.80	7	25.1	31.8	56.9	25.9	34	30.0	1.0	-0.03	4.4	12.
27.89	5.0E-03	-0.01	63.7	0.47	9	67.0	0.0	67.0	5.0	40	55.8	1.0	-0.08	0.0	16.
28.05	5.0E-03	-0.01	78.3	0.51	9	82.2	9.1	91.3	8.7	42	61.6	1.0	-0.11	1.3	21.
28.21	5.0E-03	-0.01	62.2	0.70	9	65.7	16.6	82.3	12.5	40	55.3	1.0	-0.11	2.3	18.
28.38	5.0E-04	-0.01	50.0	0.95	7	53.3	25.1	78.4	17.0	38	49.2	1.0	-0.12	4.4	21.
28.54	5.0E-03	-0.02	46.8	0.80	7	50.0	22.2	72.2	16.5	38	47.4	1.0	-0.10	2.9	15.
28.71	5.0E-04	-0.01	42.3	0.82	7	45.5	23.7	69.2	17.8	38	44.7	1.0	-0.09	4.0	18.
28.87	5.0E-04	-0.02	37.2	0.95	7	40.3	28.7	69.0	20.6	38	41.2	1.0	-0.09	4.6	17.
29.04	5.0E-04	-0.02	32.5	1.11	7	35.5	35.4	71.0	23.7	36	37.6	1.0	-0.09	5.3	16.
29.20	5.0E-04	-0.02	31.0	1.28	7	34.0	41.9	75.9	25.7	36	36.3	1.0	-0.10	5.8	16.
29.36	5.0E-04	-0.02	33.9	1.24	7	37.1	38.8	75.8	24.1	36	38.8	1.0	-0.10	5.7	17.
29.53	5.0E-04	-0.02	41.0	0.89	7	44.6	26.2	70.8	18.9	38	44.1	1.0	-0.10	4.4	18.
29.69	5.0E-03	-0.02	48.3	0.79	7	52.4	21.9	74.2	16.0	38	48.7	1.0	-0.10	2.9	15.
29.86	5.0E-03	-0.02	45.8	0.79	7	49.9	22.5	72.4	16.6	38	47.3	1.0	-0.10	2.9	15.
30.02	5.0E-03	-0.02	44.5	0.78	7	48.6	22.4	71.0	16.8	38	46.6	1.0	-0.09	2.9	14.
30.18	5.0E-04	-0.03	36.6	0.99	7	40.3	30.3	70.6	21.1	38	41.2	1.0	-0.09	4.8	18.
30.35	5.0E-04	-0.03	30.6	1.06	7	34.1	35.6	69.7	24.2	36	36.4	1.0	-0.08	5.2	16.
30.51	5.0E-04	-0.03	30.9	0.94	7	34.5	31.6	66.1	22.9	36	36.8	1.0	-0.07	4.8	16.
30.68	5.0E-05	-0.05	21.9	1.28	7	24.9	57.2	82.2	31.1	34	30.0	6.0	-0.07	7.5	17.
30.84	5.0E-05	-0.04	22.1	1.22	7	25.2	53.7	78.9	30.5	34	30.0	6.0	-0.06	7.3	17.
31.00	5.0E-04	-0.04	27.2	1.05	7	30.7	38.3	69.0	25.8	36	33.4	1.0	-0.07	5.3	15.
31.17	5.0E-04	-0.04	21.8	1.16	7	25.0	51.0	76.0	30.2	34	30.0	1.0	-0.06	5.9	14.
31.33	5.0E-04	-0.05	20.6	0.93	7	23.8	42.5	66.2	29.0	34	30.0	1.0	-0.04	5.2	12.
31.50	5.0E-04	-0.05	19.8	0.88	7	23.0	41.7	64.7	29.2	34	30.0	1.0	-0.03	5.1	12.
31.66	5.0E-04	-0.05	19.2	0.65	7	22.4	32.2	54.6	27.1	32	30.0	1.0	0.00	4.3	11.
31.82	5.0E-04	-0.04	22.7	0.51	7	26.1	23.8	49.9	22.8	34	30.0	1.0	0.00	3.6	12.

Gregg In Situ, Inc.
Run No: 98-0720-1458-2827
CPT File: 124C01.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
31.99	5.0E-04	-0.04	19.7	0.67	7	22.9	32.7	55.6	27.0	34	30.0	1.0	-0.01	4.3	11.
32.15	5.0E-04	-0.05	18.8	0.79	7	22.0	39.7	61.7	29.1	32	30.0	1.0	-0.02	4.8	12.
32.32	5.0E-04	-0.04	23.6	0.69	7	27.3	29.4	56.7	24.4	34	30.0	1.0	-0.03	4.3	13.
32.48	5.0E-04	-0.04	23.4	0.87	7	27.1	36.1	63.2	26.4	34	30.0	1.0	-0.04	4.9	13.
32.64	5.0E-04	-0.04	22.3	0.84	7	25.9	36.3	62.2	26.8	34	30.0	1.0	-0.04	4.9	13.
32.81	5.0E-04	-0.03	24.7	0.66	7	28.6	27.5	56.0	23.3	34	31.4	1.0	-0.03	4.1	13.
32.97	5.0E-04	-0.04	20.8	0.73	7	24.5	34.1	58.6	26.8	34	30.0	1.0	-0.02	4.6	12.
33.14	5.0E-04	-0.04	19.5	0.78	7	23.0	38.5	61.5	28.4	34	30.0	1.0	-0.02	4.8	12.
33.30	5.0E-04	-0.04	19.5	0.82	7	23.1	40.2	63.3	28.8	34	30.0	1.0	-0.02	5.0	12.
33.46	5.0E-04	-0.04	20.1	0.87	7	23.8	41.7	65.5	28.9	34	30.0	1.0	-0.03	5.1	12.
33.63	5.0E-04	-0.04	23.2	0.62	7	27.2	27.5	54.7	23.8	34	30.0	1.0	-0.02	4.1	13.
33.79	5.0E-04	-0.05	18.3	0.61	7	21.9	32.7	54.6	27.4	32	30.0	1.0	0.01	4.3	11.
33.96	5.0E-04	-0.05	17.1	0.32	7	20.7	0.0	20.7	5.0	32	30.0	1.0	0.06	0.0	6.
34.12	5.0E-04	-0.05	17.2	0.27	7	20.8	0.0	20.8	5.0	32	30.0	1.0	0.07	0.0	6.
34.28	5.0E-04	-0.05	16.0	0.20	7	19.5	0.0	19.5	5.0	32	30.0	1.0	0.10	0.0	6.
34.45	5.0E-04	-0.05	16.1	0.19	7	19.6	0.0	19.6	5.0	32	30.0	1.0	0.10	0.0	6.
34.61	5.0E-04	-0.05	15.6	0.20	7	19.1	0.0	19.1	5.0	32	30.0	1.0	0.10	0.0	6.
34.78	5.0E-04	-0.05	15.9	0.19	7	19.5	0.0	19.5	5.0	32	30.0	1.0	0.10	0.0	6.
34.94	5.0E-04	-0.05	15.9	0.24	7	19.5	0.0	19.5	5.0	32	30.0	1.0	0.09	0.0	6.
35.10	5.0E-04	-0.05	15.8	0.24	7	19.5	0.0	19.5	5.0	32	30.0	1.0	0.09	0.0	6.
35.27	5.0E-04	-0.04	15.5	0.25	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.09	0.0	6.
35.43	5.0E-04	-0.04	15.5	0.25	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.09	0.0	6.
35.60	5.0E-04	-0.04	15.5	0.25	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.09	0.0	6.
35.76	5.0E-04	-0.04	15.4	0.25	7	19.1	0.0	19.1	5.0	32	30.0	1.0	0.09	0.0	6.
35.92	5.0E-04	-0.04	15.5	0.24	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.09	0.0	6.
36.09	5.0E-04	-0.04	15.8	0.24	7	19.7	0.0	19.7	5.0	32	30.0	1.0	0.09	0.0	6.
36.25	5.0E-04	-0.04	16.0	0.23	7	20.0	0.0	20.0	5.0	32	30.0	1.0	0.09	0.0	6.
36.42	5.0E-04	-0.04	15.7	0.24	7	19.6	0.0	19.6	5.0	32	30.0	1.0	0.09	0.0	6.
36.58	5.0E-04	-0.04	15.2	0.25	7	19.1	0.0	19.1	5.0	32	30.0	1.0	0.09	0.0	6.
36.74	5.0E-04	-0.04	14.9	0.25	7	18.8	0.0	18.8	5.0	32	30.0	1.0	0.09	0.0	6.
36.91	5.0E-04	-0.03	14.9	0.25	7	18.8	0.0	18.8	5.0	32	30.0	1.0	0.09	0.0	6.
37.07	5.0E-04	-0.03	15.0	0.25	7	18.9	0.0	18.9	5.0	32	30.0	1.0	0.09	0.0	6.
37.24	5.0E-04	-0.03	15.5	0.24	7	19.5	0.0	19.5	5.0	32	30.0	1.0	0.09	0.0	6.
37.40	5.0E-04	-0.03	16.0	0.23	7	20.2	0.0	20.2	5.0	32	30.0	1.0	0.09	0.0	6.
37.57	5.0E-04	-0.03	15.2	0.24	7	19.3	0.0	19.3	5.0	32	30.0	1.0	0.09	0.0	6.
37.73	5.0E-04	-0.03	15.4	0.24	7	19.6	0.0	19.6	5.0	32	30.0	1.0	0.09	0.0	6.
37.89	5.0E-04	-0.03	14.8	0.25	7	18.8	0.0	18.8	5.0	32	30.0	1.0	0.09	0.0	6.
38.06	5.0E-04	-0.03	14.8	0.25	7	18.9	0.0	18.9	5.0	32	30.0	1.0	0.09	0.0	6.
38.22	5.0E-04	-0.02	15.2	0.24	7	19.4	0.0	19.4	5.0	32	30.0	1.0	0.09	0.0	6.
38.39	5.0E-04	-0.01	14.4	0.25	7	18.5	0.0	18.5	5.0	32	30.0	1.0	0.10	0.0	6.
38.55	5.0E-04	-0.01	14.7	0.29	7	18.9	0.0	18.9	5.0	32	30.0	1.0	0.08	0.0	6.
38.71	5.0E-04	-0.01	14.3	0.30	7	18.5	0.0	18.5	5.0	32	30.0	1.0	0.08	0.0	6.
38.88	5.0E-04	-0.01	14.5	0.25	7	18.8	0.0	18.8	5.0	32	30.0	1.0	0.10	0.0	6.
39.04	5.0E-04	-0.01	14.6	0.24	7	18.9	0.0	18.9	5.0	32	30.0	1.0	0.10	0.0	6.
39.21	5.0E-04	-0.01	14.0	0.25	7	18.2	0.0	18.2	5.0	32	30.0	1.0	0.10	0.0	5.
39.37	5.0E-04	-0.01	14.4	0.25	7	18.7	0.0	18.7	5.0	32	30.0	1.0	0.10	0.0	6.
39.53	5.0E-04	0.00	14.2	0.30	7	18.5	0.0	18.5	5.0	32	30.0	1.0	0.08	0.0	6.
39.70	5.0E-04	0.00	14.3	0.30	7	18.6	0.0	18.6	5.0	32	30.0	1.0	0.09	0.0	6.
39.86	5.0E-04	0.00	14.0	0.30	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.09	0.0	6.
40.03	5.0E-04	0.00	14.1	0.30	7	18.5	0.0	18.5	5.0	32	30.0	1.0	0.09	0.0	6.
40.19	5.0E-04	0.00	13.9	0.30	7	18.3	0.0	18.3	5.0	32	30.0	1.0	0.09	0.0	6.
40.35	5.0E-04	0.01	14.0	0.30	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.09	0.0	6.
40.52	5.0E-04	0.01	14.1	0.29	7	18.6	0.0	18.6	5.0	32	30.0	1.0	0.09	0.0	6.
40.68	5.0E-04	0.01	13.9	0.30	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.09	0.0	6.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
40.85	5.0E-04	0.01	13.9	0.30	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.09	0.0	6.
41.01	5.0E-04	0.02	14.1	0.29	7	18.7	0.0	18.7	5.0	32	30.0	1.0	0.09	0.0	6.
41.17	5.0E-04	0.02	13.9	0.30	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.09	0.0	6.
41.34	5.0E-04	0.02	13.8	0.29	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.09	0.0	6.
41.50	5.0E-04	0.02	13.8	0.10	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.18	0.0	6.
41.67	5.0E-04	0.03	13.4	0.10	7	18.0	0.0	18.0	5.0	32	30.0	1.0	0.18	0.0	5.
41.83	5.0E-04	0.04	13.3	0.10	7	17.9	0.0	17.9	5.0	32	30.0	1.0	0.18	0.0	5.
41.99	5.0E-04	0.05	13.5	0.10	7	18.2	0.0	18.2	5.0	32	30.0	1.0	0.18	0.0	5.
42.16	5.0E-04	0.05	13.5	0.10	7	18.2	0.0	18.2	5.0	32	30.0	1.0	0.18	0.0	5.
42.32	5.0E-04	0.05	13.4	0.10	7	18.1	0.0	18.1	5.0	32	30.0	1.0	0.18	0.0	5.
42.49	5.0E-04	0.06	13.3	0.10	7	18.0	0.0	18.0	5.0	32	30.0	1.0	0.18	0.0	5.
42.65	5.0E-04	0.06	13.5	0.15	7	18.3	0.0	18.3	5.0	32	30.0	1.0	0.15	0.0	6.
42.81	5.0E-04	0.07	13.3	0.25	7	18.0	0.0	18.0	5.0	32	30.0	1.0	0.11	0.0	5.
42.98	5.0E-04	0.07	13.6	0.24	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.11	0.0	6.
43.14	5.0E-04	0.07	13.8	0.24	7	18.7	0.0	18.7	5.0	32	30.0	1.0	0.11	0.0	6.
43.31	5.0E-04	0.08	14.0	0.23	7	19.0	0.0	19.0	5.0	32	30.0	1.0	0.11	0.0	6.
43.47	5.0E-04	0.08	13.8	0.24	7	18.7	0.0	18.7	5.0	32	30.0	1.0	0.11	0.0	6.
43.63	5.0E-04	0.09	13.6	0.24	7	18.5	0.0	18.5	5.0	32	30.0	1.0	0.11	0.0	6.
43.80	5.0E-04	0.10	13.6	0.24	7	18.6	0.0	18.6	5.0	32	30.0	1.0	0.11	0.0	6.
43.96	5.0E-04	0.11	13.3	0.24	7	18.2	0.0	18.2	5.0	32	30.0	1.0	0.12	0.0	5.
44.13	5.0E-04	0.11	13.6	0.24	7	18.6	0.0	18.6	5.0	32	30.0	1.0	0.12	0.0	6.
44.29	5.0E-04	0.11	13.4	0.24	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.12	0.0	6.
44.45	5.0E-04	0.12	13.5	0.24	7	18.6	0.0	18.6	5.0	32	30.0	1.0	0.12	0.0	6.
44.62	5.0E-04	0.13	13.3	0.24	7	18.3	0.0	18.3	5.0	32	30.0	1.0	0.12	0.0	6.
44.78	5.0E-04	0.13	13.3	0.24	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.12	0.0	6.
44.95	5.0E-04	0.13	13.4	0.24	7	18.5	0.0	18.5	5.0	32	30.0	1.0	0.12	0.0	6.
45.11	5.0E-04	0.13	13.6	0.23	7	18.8	0.0	18.8	5.0	32	30.0	1.0	0.12	0.0	6.
45.28	5.0E-04	0.12	13.3	0.24	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.12	0.0	6.
45.44	5.0E-04	0.13	13.3	0.24	7	18.5	0.0	18.5	5.0	32	30.0	1.0	0.12	0.0	6.
45.60	5.0E-04	0.13	13.5	0.23	7	18.7	0.0	18.7	5.0	32	30.0	1.0	0.12	0.0	6.
45.77	5.0E-04	0.14	13.2	0.24	7	18.4	0.0	18.4	5.0	32	30.0	1.0	0.12	0.0	6.
45.93	5.0E-04	0.13	13.6	0.23	7	18.9	0.0	18.9	5.0	32	30.0	1.0	0.12	0.0	6.
46.10	5.0E-04	0.14	13.2	0.24	7	18.5	0.0	18.5	5.0	32	30.0	1.0	0.12	0.0	6.
46.26	5.0E-04	0.14	13.5	0.23	7	18.8	0.0	18.8	5.0	32	30.0	1.0	0.12	0.0	6.
46.42	5.0E-04	0.14	13.3	0.28	7	18.6	0.0	18.6	5.0	32	30.0	1.0	0.11	0.0	6.
46.59	5.0E-04	0.14	13.3	0.28	7	18.7	0.0	18.7	5.0	32	30.0	1.0	0.11	0.0	6.
46.75	5.0E-04	0.14	13.3	0.28	7	18.8	0.0	18.8	5.0	32	30.0	1.0	0.11	0.0	6.
46.92	5.0E-04	0.14	13.3	0.28	7	18.7	0.0	18.7	5.0	32	30.0	1.0	0.11	0.0	6.
47.08	5.0E-04	0.14	13.4	0.28	7	18.8	0.0	18.8	5.0	32	30.0	1.0	0.11	0.0	6.
47.24	5.0E-04	0.14	13.5	0.23	7	19.1	0.0	19.1	5.0	32	30.0	1.0	0.12	0.0	6.
47.41	5.0E-04	0.14	13.1	0.23	7	18.6	0.0	18.6	5.0	32	30.0	1.0	0.12	0.0	6.
47.57	5.0E-04	0.14	13.2	0.23	7	18.7	0.0	18.7	5.0	32	30.0	1.0	0.12	0.0	6.
47.74	5.0E-04	0.14	13.2	0.23	7	18.7	0.0	18.7	5.0	32	30.0	1.0	0.12	0.0	6.
47.90	5.0E-04	0.14	13.3	0.23	7	18.9	0.0	18.9	5.0	32	30.0	1.0	0.12	0.0	6.
48.06	5.0E-04	0.15	13.1	0.23	7	18.7	0.0	18.7	5.0	32	30.0	1.0	0.13	0.0	6.
48.23	5.0E-04	0.14	13.2	0.23	7	18.8	0.0	18.8	5.0	32	30.0	1.0	0.13	0.0	6.
48.39	5.0E-04	0.15	13.3	0.22	7	19.0	0.0	19.0	5.0	32	30.0	1.0	0.13	0.0	6.
48.56	5.0E-04	0.15	13.3	0.22	7	19.1	0.0	19.1	5.0	32	30.0	1.0	0.13	0.0	6.
48.72	5.0E-04	0.15	13.2	0.23	7	19.0	0.0	19.0	5.0	32	30.0	1.0	0.13	0.0	6.
48.88	5.0E-04	0.14	13.2	0.22	7	19.0	0.0	19.0	5.0	32	30.0	1.0	0.13	0.0	6.
49.05	5.0E-04	0.14	13.1	0.23	7	18.8	0.0	18.8	5.0	32	30.0	1.0	0.13	0.0	6.
49.21	5.0E-04	0.14	13.4	0.22	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.13	0.0	6.
49.38	5.0E-04	0.15	12.8	0.23	7	18.6	0.0	18.6	5.0	32	30.0	1.0	0.13	0.0	6.
49.54	5.0E-04	0.16	12.9	0.23	7	18.6	0.0	18.6	5.0	32	30.0	1.0	0.13	0.0	6.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
49.70	5.0E-04	0.16	13.0	0.23	7	18.9	0.0	18.9	5.0	32	30.0	1.0	0.13	0.0	6.
49.87	5.0E-04	0.15	13.2	0.22	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.13	0.0	6.
50.03	5.0E-04	0.15	13.1	0.27	7	19.0	0.0	19.0	5.0	32	30.0	1.0	0.11	0.0	6.
50.20	5.0E-04	0.15	13.0	0.27	7	19.0	0.0	19.0	5.0	32	30.0	1.0	0.12	0.0	6.
50.36	5.0E-04	0.15	13.2	0.26	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.12	0.0	6.
50.52	5.0E-04	0.15	13.4	0.26	7	19.5	0.0	19.5	5.0	32	30.0	1.0	0.12	0.0	6.
50.69	5.0E-04	0.15	13.2	0.26	7	19.3	0.0	19.3	5.0	32	30.0	1.0	0.11	0.0	6.
50.85	5.0E-04	0.15	13.3	0.26	7	19.4	0.0	19.4	5.0	32	30.0	1.0	0.11	0.0	6.
51.02	5.0E-04	0.15	13.0	0.27	7	19.0	0.0	19.0	5.0	32	30.0	1.0	0.12	0.0	6.
51.18	5.0E-04	0.14	13.1	0.26	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.12	0.0	6.
51.34	5.0E-04	0.14	13.2	0.26	7	19.3	0.0	19.3	5.0	32	30.0	1.0	0.12	0.0	6.
51.51	5.0E-04	0.14	13.2	0.17	7	19.3	0.0	19.3	5.0	32	30.0	1.0	0.15	0.0	6.
51.67	5.0E-04	0.16	12.9	0.18	7	19.0	0.0	19.0	5.0	32	30.0	1.0	0.15	0.0	6.
51.84	5.0E-04	0.15	13.0	0.17	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.15	0.0	6.
52.00	5.0E-04	0.16	12.9	0.18	7	19.1	0.0	19.1	5.0	32	30.0	1.0	0.15	0.0	6.
52.16	5.0E-04	0.15	13.0	0.17	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.15	0.0	6.
52.33	5.0E-04	0.16	13.0	0.17	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.15	0.0	6.
52.49	5.0E-04	0.16	13.2	0.17	7	19.5	0.0	19.5	5.0	32	30.0	1.0	0.15	0.0	6.
52.66	5.0E-04	0.17	12.9	0.17	7	19.2	0.0	19.2	5.0	32	30.0	1.0	0.15	0.0	6.
52.82	5.0E-04	0.17	12.9	0.17	7	19.3	0.0	19.3	5.0	32	30.0	1.0	0.15	0.0	6.
52.98	5.0E-04	0.17	13.1	0.17	7	19.5	0.0	19.5	5.0	32	30.0	1.0	0.15	0.0	6.
53.15	5.0E-04	0.16	13.1	0.17	7	19.5	0.0	19.5	5.0	32	30.0	1.0	0.15	0.0	6.
53.31	5.0E-04	0.16	13.0	0.17	7	19.3	0.0	19.3	5.0	32	30.0	1.0	0.15	0.0	6.
53.48	5.0E-04	0.16	13.3	0.17	7	19.9	0.0	19.9	5.0	32	30.0	1.0	0.15	0.0	6.
53.64	5.0E-04	0.16	13.1	0.17	7	19.6	0.0	19.6	5.0	32	30.0	1.0	0.15	0.0	6.
53.81	5.0E-04	0.16	13.1	0.17	7	19.6	0.0	19.6	5.0	32	30.0	1.0	0.15	0.0	6.
53.97	5.0E-04	0.17	13.1	0.17	7	19.6	0.0	19.6	5.0	32	30.0	1.0	0.15	0.0	6.
54.13	5.0E-04	0.17	13.3	0.21	7	19.9	0.0	19.9	5.0	32	30.0	1.0	0.14	0.0	6.
54.30	5.0E-04	0.17	13.2	0.21	7	19.8	0.0	19.8	5.0	32	30.0	1.0	0.14	0.0	6.
54.46	5.0E-04	0.17	13.4	0.20	7	20.1	0.0	20.1	5.0	32	30.0	1.0	0.13	0.0	6.
54.63	5.0E-04	0.17	13.4	0.20	7	20.1	0.0	20.1	5.0	32	30.0	1.0	0.14	0.0	6.
54.79	5.0E-04	0.17	13.6	0.20	7	20.4	0.0	20.4	5.0	32	30.0	1.0	0.14	0.0	6.
54.95	5.0E-04	0.17	13.5	0.20	7	20.3	0.0	20.3	5.0	32	30.0	1.0	0.14	0.0	6.
55.12	5.0E-04	0.17	13.5	0.16	7	20.3	0.0	20.3	5.0	32	30.0	1.0	0.15	0.0	6.
55.28	5.0E-04	0.17	13.2	0.16	7	20.0	0.0	20.0	5.0	32	30.0	1.0	0.15	0.0	6.
55.45	5.0E-04	0.17	12.9	0.17	7	19.6	0.0	19.6	5.0	32	30.0	1.0	0.15	0.0	6.
55.61	5.0E-04	0.16	13.0	0.16	7	19.8	0.0	19.8	5.0	32	30.0	1.0	0.15	0.0	6.
55.77	5.0E-04	0.17	13.5	0.16	7	20.4	0.0	20.4	5.0	32	30.0	1.0	0.15	0.0	6.
55.94	5.0E-04	0.15	13.5	0.08	7	20.5	0.0	20.5	5.0	32	30.0	1.0	0.21	0.0	6.
56.10	5.0E-04	0.15	13.5	0.08	7	20.5	0.0	20.5	5.0	32	30.0	1.0	0.21	0.0	6.
56.27	5.0E-04	0.16	13.5	0.12	7	20.5	0.0	20.5	5.0	32	30.0	1.0	0.18	0.0	6.
56.43	5.0E-04	0.16	13.4	0.16	7	20.4	0.0	20.4	5.0	32	30.0	1.0	0.15	0.0	6.
56.59	5.0E-04	0.17	13.6	0.16	7	20.7	0.0	20.7	5.0	32	30.0	1.0	0.15	0.0	6.
56.76	5.0E-04	0.15	13.6	0.15	7	20.8	0.0	20.8	5.0	32	30.0	1.0	0.15	0.0	6.
56.92	5.0E-04	0.16	13.4	0.16	7	20.5	0.0	20.5	5.0	32	30.0	1.0	0.15	0.0	6.
57.09	5.0E-04	0.16	13.5	0.16	7	20.6	0.0	20.6	5.0	32	30.0	1.0	0.15	0.0	6.
57.25	5.0E-04	0.16	13.5	0.16	7	20.7	0.0	20.7	5.0	32	30.0	1.0	0.16	0.0	6.
57.41	5.0E-04	0.16	13.5	0.15	7	20.7	0.0	20.7	5.0	32	30.0	1.0	0.16	0.0	6.
57.58	5.0E-04	0.17	13.5	0.15	7	20.7	0.0	20.7	5.0	32	30.0	1.0	0.16	0.0	6.
57.74	5.0E-04	0.16	13.6	0.15	7	20.9	0.0	20.9	5.0	32	30.0	1.0	0.16	0.0	6.
57.91	5.0E-04	0.17	13.7	0.23	7	21.0	0.0	21.0	5.0	32	30.0	1.0	0.13	0.0	6.
58.07	5.0E-04	0.17	13.8	0.30	7	21.2	0.0	21.2	5.0	32	30.0	1.0	0.10	0.0	6.
58.23	5.0E-04	0.15	14.6	0.43	7	22.3	0.0	22.3	5.0	32	30.0	1.0	0.07	0.0	7.
58.40	5.0E-04	0.13	15.9	0.65	7	24.2	50.3	74.4	30.3	32	30.0	1.0	0.03	5.8	13.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
58.56	5.0E-04	0.07	16.5	0.99	7	25.0	78.8	103.8	33.4	32	30.0	1.0	-0.01	7.4	15.
58.73	5.0E-04	0.07	17.7	0.90	7	26.7	62.3	89.0	31.2	32	30.0	1.0	-0.01	6.8	15.
58.89	5.0E-04	0.08	16.0	0.61	7	24.4	47.2	71.6	29.7	32	30.0	1.0	0.03	5.6	13.
59.05	5.0E-04	0.12	15.0	0.78	7	23.0	68.1	91.1	33.0	32	30.0	1.0	0.02	6.6	14.
59.22	5.0E-04	0.11	18.9	1.05	7	28.4	69.5	97.9	31.6	32	31.2	1.0	-0.02	7.4	16.
59.38	5.0E-04	0.03	23.5	1.10	7	34.8	58.2	93.0	28.4	34	37.0	1.0	-0.06	7.3	18.
59.55	5.0E-04	0.01	27.0	1.15	7	39.5	54.6	94.2	26.7	36	40.7	1.0	-0.07	7.3	20.
59.71	5.0E-04	0.00	25.0	1.39	7	36.9	72.6	109.5	29.8	34	38.7	1.0	-0.08	8.5	20.
59.87	5.0E-04	0.00	20.9	1.76	6	31.3	125.1	156.4	35.5	34	34.0	1.0	-0.08	10.2	20.
60.04	5.0E-04	0.01	29.8	1.65	7	43.7	77.1	120.8	28.9	36	43.5	1.0	-0.11	9.5	23.
60.20	5.0E-03	0.00	50.5	1.31	7	72.3	45.9	118.2	19.5	38	58.0	1.0	-0.15	5.7	23.
60.37	5.0E-03	0.00	66.1	1.27	7	94.0	40.3	134.3	16.2	40	65.5	1.0	-0.17	5.3	28.
60.53	5.0E-03	0.00	75.7	1.39	7	107.5	42.8	150.2	15.7	40	69.3	1.0	-0.19	5.7	32.
60.69	5.0E-03	0.00	82.2	1.43	7	116.5	43.1	159.6	15.1	42	71.7	1.0	-0.20	5.8	34.
60.86	5.0E-03	0.00	90.1	1.57	7	127.7	46.6	174.3	15.0	42	74.3	1.0	-0.22	6.3	37.
61.02	5.0E-03	0.00	96.8	1.66	7	137.2	49.0	186.2	14.9	42	76.3	1.0	-0.24	6.6	40.
61.19	5.0E-03	0.00	98.0	1.66	7	138.9	49.0	187.9	14.8	42	76.7	1.0	-0.24	6.6	40.
61.35	5.0E-03	0.00	94.9	1.80	7	134.8	54.4	189.3	15.8	42	75.8	1.0	-0.24	7.2	40.
61.52	5.0E-03	0.00	91.2	1.78	7	129.8	54.4	184.2	16.1	42	74.7	1.0	-0.24	7.2	38.
61.68	5.0E-03	0.00	88.4	1.84	7	126.1	56.9	183.0	16.6	42	73.9	1.0	-0.24	7.4	38.
61.84	5.0E-03	-0.01	84.6	1.80	7	120.9	56.2	177.1	16.9	42	72.7	1.0	-0.23	7.3	36.
62.01	5.0E-03	-0.01	79.4	1.85	7	113.7	59.0	172.7	17.8	42	71.0	1.0	-0.23	7.6	35.
62.17	5.0E-04	-0.01	74.5	1.89	7	107.0	61.4	168.4	18.7	40	69.2	1.0	-0.23	10.3	45.
62.34	5.0E-03	0.00	77.8	1.85	7	111.8	59.3	171.1	18.0	42	70.5	1.0	-0.23	7.6	34.
62.50	5.0E-03	0.00	80.3	1.84	7	115.4	58.5	173.9	17.6	42	71.4	1.0	-0.23	7.5	35.
62.66	5.0E-03	0.00	80.4	1.89	7	115.8	60.2	176.0	17.8	42	71.5	1.0	-0.23	7.7	36.
62.83	5.0E-03	0.00	80.8	1.84	7	116.4	58.7	175.1	17.6	42	71.6	1.0	-0.23	7.6	36.
62.99	5.0E-03	0.00	79.7	1.85	7	115.0	59.0	174.0	17.7	42	71.3	1.0	-0.23	7.6	35.
63.16	5.0E-04	0.00	72.7	1.98	7	105.2	65.4	170.6	19.4	40	68.7	1.0	-0.23	10.8	45.
63.32	5.0E-04	-0.01	67.9	1.92	7	98.5	64.5	163.0	19.8	40	66.8	1.0	-0.22	10.6	42.
63.48	5.0E-03	0.00	68.6	1.83	7	99.6	60.8	160.5	19.2	40	67.2	1.0	-0.21	7.6	32.
63.65	5.0E-03	-0.01	72.5	1.75	7	105.3	57.0	162.3	18.2	40	68.8	1.0	-0.21	7.3	33.
63.81	5.0E-03	-0.01	73.7	1.81	7	107.1	59.0	166.1	18.3	40	69.2	1.0	-0.22	7.5	33.
63.98	5.0E-03	-0.01	72.7	1.85	7	105.8	60.7	166.6	18.7	40	68.9	1.0	-0.22	7.7	33.
64.14	5.0E-03	-0.01	71.6	1.86	7	104.4	61.7	166.1	18.9	40	68.5	1.0	-0.22	7.7	33.
64.30	5.0E-04	-0.01	67.5	1.94	7	98.7	65.4	164.1	19.9	40	66.9	1.0	-0.22	10.7	42.
64.47	5.0E-04	-0.01	63.3	1.97	7	92.8	68.0	160.8	20.8	40	65.1	1.0	-0.21	10.9	41.
64.63	5.0E-04	-0.01	60.1	2.02	7	88.3	71.2	159.5	21.7	40	63.7	1.0	-0.21	11.2	40.
64.80	5.0E-04	-0.01	56.4	1.96	7	83.2	70.0	153.2	22.1	40	62.0	1.0	-0.20	10.9	38.
64.96	5.0E-04	-0.01	53.8	1.94	7	79.4	70.4	149.8	22.6	40	60.7	1.0	-0.19	10.8	36.
65.12	5.0E-04	-0.01	48.8	2.07	7	72.4	78.6	151.0	24.5	38	58.0	1.0	-0.19	11.4	35.
65.29	5.0E-04	-0.01	43.4	2.39	7	64.7	100.1	164.8	27.7	38	54.8	1.0	-0.20	12.9	34.
65.45	5.0E-04	-0.01	41.9	2.27	7	62.7	95.4	158.1	27.6	38	53.9	1.0	-0.19	12.4	32.
65.62	5.0E-04	-0.01	44.0	1.95	7	65.8	76.8	142.6	25.2	38	55.3	1.0	-0.17	10.9	32.
65.78	5.0E-03	-0.02	42.2	1.21	7	63.3	47.2	110.5	21.0	38	54.2	1.0	-0.12	5.6	21.
65.94	5.0E-03	-0.02	48.6	0.96	7	72.5	36.0	108.5	17.4	38	58.1	1.0	-0.12	4.6	22.
66.11	5.0E-03	-0.02	45.6	0.99	7	68.2	37.7	106.0	18.3	38	56.3	1.0	-0.11	4.8	21.
66.27	5.0E-03	-0.02	43.7	1.08	7	65.6	41.9	107.4	19.6	38	55.2	1.0	-0.12	5.2	21.
66.44	5.0E-03	-0.02	43.4	1.26	7	65.3	48.9	114.2	21.0	38	55.1	1.0	-0.13	5.8	21.
66.60	5.0E-03	-0.02	42.5	1.52	7	64.1	59.8	123.9	23.1	38	54.5	1.0	-0.15	6.8	22.
66.76	5.0E-04	-0.02	40.2	2.14	7	60.8	91.5	152.3	27.5	38	53.0	1.0	-0.18	11.9	31.
66.93	5.0E-05	-0.03	33.0	3.12	6	50.4	201.4	251.8	35.3	36	47.6	6.0	-0.21	19.7	39.
67.09	5.0E-06	-0.04	23.5	3.77	6	36.7	146.7	183.3	43.9	UnDef	UnDef	6.0	UnDef	17.9	35.
67.26	5.0E-05	-0.04	21.3	3.23	6	33.6	134.4	168.0	43.3	34	36.0	6.0	-0.16	13.2	26.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
67.42	5.0E-05	-0.05	18.3	2.98	6	29.2	116.8	146.1	45.0	32	32.0	6.0	-0.13	11.4	22.
67.58	5.0E-05	-0.06	14.6	2.68	6	23.8	95.3	119.1	48.0	32	30.0	6.0	-0.09	9.3	18.
67.75	5.0E-05	-0.07	13.3	2.12	6	22.0	87.8	109.8	46.6	32	30.0	6.0	-0.06	8.6	17.
67.91	5.0E-05	-0.07	12.3	1.65	6	20.6	82.4	103.0	44.9	30	30.0	3.0	-0.03	8.1	16.
68.08	5.0E-05	-0.06	12.4	1.79	6	20.7	82.8	103.5	45.8	30	30.0	3.0	-0.04	8.1	16.
68.24	5.0E-05	-0.04	17.2	2.15	6	27.7	111.0	138.7	41.6	32	30.5	6.0	-0.08	10.9	21.
68.40	5.0E-04	-0.03	25.7	2.01	6	40.2	128.9	169.1	33.5	36	41.2	1.0	-0.12	12.0	25.
68.57	5.0E-04	-0.01	40.1	1.94	7	61.3	81.5	142.8	26.4	38	53.3	1.0	-0.16	11.1	31.
68.73	5.0E-04	-0.01	37.9	2.52	6	58.1	121.1	179.2	30.3	38	51.7	1.0	-0.19	13.9	32.
68.90	5.0E-05	-0.01	33.8	3.09	6	52.2	201.2	253.4	34.7	36	48.6	6.0	-0.21	20.2	40.
69.06	5.0E-06	-0.01	29.7	3.88	6	46.2	184.8	231.0	40.2	UnDef	UnDef	6.0	UnDef	22.6	45.
69.22	5.0E-06	-0.02	29.0	4.19	6	45.3	181.0	226.3	41.8	UnDef	UnDef	6.0	UnDef	22.1	44.
69.39	5.0E-04	-0.01	38.1	2.44	7	58.7	114.8	173.5	29.8	38	52.0	1.0	-0.19	13.5	32.
69.55	5.0E-04	-0.01	55.7	1.84	7	84.6	67.5	152.1	21.6	40	62.5	1.0	-0.19	10.6	38.
69.72	5.0E-04	-0.02	47.7	2.49	7	73.0	102.8	175.8	26.9	38	58.2	1.0	-0.21	13.7	37.
69.88	5.0E-04	-0.02	35.7	2.56	6	55.4	131.4	186.8	31.4	38	50.3	1.0	-0.18	14.2	32.
70.05	5.0E-04	-0.02	40.7	1.93	7	62.7	81.3	144.0	26.1	38	53.9	1.0	-0.17	11.2	31.
70.21	5.0E-03	-0.02	45.1	0.97	7	69.3	38.2	107.5	18.3	38	56.8	1.0	-0.11	4.8	21.
70.37	5.0E-03	-0.02	42.1	1.49	7	64.9	60.1	125.0	23.0	38	54.9	1.0	-0.14	6.8	22.
70.54	5.0E-04	-0.03	28.9	2.44	6	45.5	156.7	202.2	34.0	36	44.7	1.0	-0.16	14.0	28.
70.70	5.0E-05	-0.06	14.8	3.10	4	24.7	98.7	123.4	49.9	32	30.0	6.0	-0.11	9.7	19.
70.87	5.0E-04	-0.06	14.0	1.00	6	23.5	94.0	117.5	36.5	32	30.0	1.0	-0.01	7.7	15.
71.03	5.0E-04	-0.06	13.6	0.77	7	23.0	85.7	108.7	34.5	32	30.0	1.0	0.01	7.3	14.
71.19	5.0E-04	-0.07	12.7	0.79	6	21.6	86.4	108.0	36.1	32	30.0	1.0	0.02	7.0	14.
71.36	5.0E-04	-0.03	12.8	0.92	6	21.7	86.9	108.6	37.5	32	30.0	1.0	0.01	7.1	14.
71.52	5.0E-05	-0.03	13.2	2.13	6	22.4	89.7	112.2	46.7	32	30.0	6.0	-0.05	8.8	17.
71.69	5.0E-04	-0.01	23.3	2.26	6	37.5	150.0	187.5	36.6	34	39.2	1.0	-0.12	12.2	24.
71.85	5.0E-04	0.00	35.7	2.12	7	55.9	100.5	156.4	29.1	38	50.6	1.0	-0.16	12.3	30.
72.01	5.0E-03	-0.01	50.8	1.69	7	78.6	64.2	142.8	21.8	38	60.4	1.0	-0.17	7.5	26.
72.18	5.0E-03	-0.01	57.5	1.76	7	88.7	64.5	153.2	20.8	40	63.8	1.0	-0.19	7.8	29.
72.34	5.0E-04	-0.01	56.5	1.82	7	87.2	67.3	154.6	21.3	40	63.4	1.0	-0.19	10.7	39.
72.51	5.0E-03	-0.01	57.9	1.70	7	89.4	62.3	151.7	20.4	40	64.1	1.0	-0.19	7.6	29.
72.67	5.0E-03	-0.01	60.9	1.65	7	94.0	59.4	153.4	19.5	40	65.5	1.0	-0.19	7.4	30.
72.83	5.0E-03	-0.01	61.5	1.61	7	95.1	58.0	153.0	19.2	40	65.8	1.0	-0.19	7.2	30.
73.00	5.0E-03	-0.01	59.0	1.64	7	91.3	59.7	151.0	19.8	40	64.7	1.0	-0.19	7.3	29.
73.16	5.0E-04	-0.01	55.3	1.92	7	85.8	72.6	158.5	22.2	40	62.9	1.0	-0.20	11.3	39.
73.33	5.0E-04	-0.01	48.9	2.27	7	76.3	92.6	169.0	25.5	38	59.5	1.0	-0.20	13.0	37.
73.49	5.0E-04	-0.01	42.5	2.59	7	66.8	118.8	185.6	29.0	38	55.7	1.0	-0.21	14.6	36.
73.65	5.0E-05	-0.02	33.4	2.98	6	53.2	194.1	247.2	34.4	36	49.2	6.0	-0.20	20.1	40.
73.82	5.0E-05	-0.03	26.8	2.86	6	43.2	172.9	216.1	37.5	36	43.2	6.0	-0.17	16.9	33.
73.98	5.0E-05	-0.04	20.2	3.06	6	33.3	133.3	166.6	43.5	34	35.8	6.0	-0.14	13.0	26.
74.15	5.0E-06	-0.05	14.6	3.46	4	24.8	99.1	123.9	52.1	UnDef	UnDef	6.0	UnDef	12.1	24.
74.31	5.0E-05	-0.05	14.0	3.15	4	23.9	95.7	119.7	51.4	32	30.0	6.0	-0.10	9.4	18.
74.47	5.0E-05	-0.04	16.0	2.99	6	27.0	107.8	134.8	47.8	32	30.0	6.0	-0.11	10.6	21.
74.64	5.0E-05	-0.04	15.6	2.33	6	26.4	105.6	132.0	44.7	32	30.0	6.0	-0.08	10.3	20.
74.80	5.0E-05	-0.05	12.1	2.42	6	21.1	84.5	105.6	50.5	30	30.0	3.0	-0.06	8.3	16.
74.97	5.0E-05	-0.05	11.9	2.73	4	20.9	83.5	104.4	52.7	30	30.0	3.0	-0.06	8.2	16.
75.13	5.0E-05	-0.03	16.1	2.81	6	27.3	109.2	136.5	46.7	32	30.1	6.0	-0.10	10.7	21.
75.29	5.0E-05	-0.03	18.1	3.10	6	30.3	121.2	151.5	45.8	32	33.0	6.0	-0.13	11.9	23.
75.46	5.0E-05	-0.04	15.5	3.05	6	26.4	105.6	132.0	48.7	32	30.0	6.0	-0.11	10.3	20.
75.62	5.0E-05	-0.05	12.4	2.80	4	21.7	86.8	108.5	52.2	30	30.0	3.0	-0.07	8.5	17.
75.79	5.0E-05	-0.04	15.1	2.36	6	25.8	103.1	128.9	45.5	32	30.0	6.0	-0.08	10.1	20.
75.95	5.0E-05	-0.03	16.9	2.82	6	28.6	114.6	143.2	45.8	32	31.4	6.0	-0.11	11.2	22.
76.11	5.0E-05	-0.04	16.2	3.09	6	27.6	110.4	138.0	48.0	32	30.4	6.0	-0.11	10.8	21.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
76.28	5.0E-05	-0.03	18.7	2.81	6	31.4	125.5	156.8	43.8	32	34.0	6.0	-0.12	12.3	24.
76.44	5.0E-05	-0.03	21.4	2.45	6	35.7	142.6	178.3	39.2	34	37.7	6.0	-0.12	14.0	27.
76.61	5.0E-05	-0.03	17.5	3.20	6	29.6	118.5	148.2	47.0	32	32.4	6.0	-0.13	11.6	23.
76.77	5.0E-05	-0.03	18.3	3.08	6	30.9	123.7	154.6	45.5	32	33.6	6.0	-0.13	12.1	24.
76.93	5.0E-05	-0.02	21.8	3.01	6	36.3	145.1	181.3	41.9	34	38.2	6.0	-0.15	14.2	28.
77.10	5.0E-04	-0.02	36.8	1.85	7	59.3	85.0	144.4	27.1	38	52.3	1.0	-0.15	11.3	30.
77.26	5.0E-04	-0.01	43.2	1.85	7	69.3	78.3	147.6	24.9	38	56.8	1.0	-0.17	11.2	33.
77.43	5.0E-04	-0.02	42.9	2.48	7	68.9	114.0	182.9	28.3	38	56.6	1.0	-0.20	14.4	36.
77.59	5.0E-04	-0.02	39.4	2.63	6	63.5	131.7	195.2	30.3	38	54.3	1.0	-0.20	15.1	35.
77.75	5.0E-04	-0.02	37.9	2.70	6	61.3	141.8	203.1	31.2	38	53.2	1.0	-0.20	15.5	35.
77.92	5.0E-04	-0.01	46.2	2.59	7	74.2	115.9	190.1	27.8	38	58.7	1.0	-0.22	14.9	39.
78.08	5.0E-04	-0.01	46.3	2.80	6	74.3	129.5	203.8	28.8	38	58.8	1.0	-0.23	16.0	40.
78.25	5.0E-04	-0.01	46.9	2.79	7	75.4	127.8	203.2	28.6	38	59.2	1.0	-0.23	16.0	40.
78.41	5.0E-04	-0.01	48.3	2.68	7	77.6	118.9	196.5	27.7	38	60.0	1.0	-0.23	15.4	40.
78.58	5.0E-04	-0.01	47.8	2.62	7	77.0	115.9	192.8	27.5	38	59.8	1.0	-0.22	15.1	40.
78.74	5.0E-05	-0.01	44.4	2.97	6	71.6	146.4	218.0	30.1	38	57.7	6.0	-0.23	20.3	48.
78.90	5.0E-05	-0.02	39.5	3.35	6	64.2	202.2	266.5	33.4	38	54.6	6.0	-0.24	22.7	47.
79.07	5.0E-05	-0.02	34.3	3.46	6	56.1	224.3	280.4	36.1	38	50.7	6.0	-0.23	22.0	43.
79.23	5.0E-04	-0.02	40.3	2.74	6	65.6	139.0	204.6	30.4	38	55.2	1.0	-0.21	15.8	37.
79.40	5.0E-04	-0.02	43.3	2.35	7	70.3	106.6	176.8	27.6	38	57.2	1.0	-0.20	13.9	36.
79.56	5.0E-04	-0.02	45.8	2.26	7	74.2	98.1	172.3	26.3	38	58.7	1.0	-0.20	13.4	37.
79.72	5.0E-04	-0.02	47.8	2.27	7	77.4	97.0	174.4	25.8	38	59.9	1.0	-0.20	13.5	38.
79.89	5.0E-04	-0.02	48.8	2.25	7	79.1	94.8	173.9	25.4	38	60.5	1.0	-0.20	13.3	39.
80.05	5.0E-04	-0.02	48.2	2.28	7	78.1	97.3	175.4	25.8	38	60.2	1.0	-0.20	13.5	39.
80.22	5.0E-04	-0.02	46.9	2.27	7	76.2	98.0	174.2	26.1	38	59.5	1.0	-0.20	13.5	38.
80.38	5.0E-04	-0.02	44.9	2.46	7	73.1	111.2	184.3	27.6	38	58.3	1.0	-0.21	14.5	38.
80.54	5.0E-04	-0.02	44.6	2.23	7	72.8	98.3	171.1	26.5	38	58.2	1.0	-0.19	13.3	37.
80.71	5.0E-04	-0.02	45.1	2.20	7	73.6	96.4	170.0	26.2	38	58.5	1.0	-0.19	13.2	37.
80.87	5.0E-04	-0.02	45.9	1.94	7	74.9	82.0	157.0	24.6	38	59.0	1.0	-0.18	11.9	36.
81.04	5.0E-04	-0.02	47.1	1.91	7	76.9	79.9	156.8	24.1	38	59.7	1.0	-0.18	11.7	36.
81.20	5.0E-04	-0.02	47.3	1.93	7	77.2	81.0	158.2	24.2	38	59.8	1.0	-0.18	11.9	37.
81.36	5.0E-04	-0.02	48.3	1.91	7	78.8	79.4	158.3	23.8	38	60.5	1.0	-0.18	11.8	37.
81.53	5.0E-03	-0.02	51.3	1.74	7	83.7	69.7	153.4	22.0	38	62.2	1.0	-0.18	8.1	28.
81.69	5.0E-04	-0.02	51.1	1.84	7	83.4	74.5	157.9	22.7	38	62.1	1.0	-0.18	11.4	38.
81.86	5.0E-04	-0.02	50.0	1.84	7	81.8	75.0	156.8	22.9	38	61.5	1.0	-0.18	11.4	38.
82.02	5.0E-03	-0.02	49.9	1.73	7	81.7	70.3	152.0	22.3	38	61.5	1.0	-0.18	8.1	28.
82.18	5.0E-03	-0.02	48.3	1.71	7	79.3	70.4	149.7	22.6	38	60.6	1.0	-0.17	8.1	27.
82.35	5.0E-03	-0.02	48.3	1.73	7	79.3	71.1	150.4	22.7	38	60.6	1.0	-0.17	8.1	27.
82.51	5.0E-03	-0.02	51.6	1.50	7	84.5	59.9	144.5	20.5	38	62.5	1.0	-0.16	7.2	27.
82.68	5.0E-03	-0.02	50.9	1.82	7	83.6	74.0	157.6	22.6	38	62.2	1.0	-0.18	8.5	29.
82.84	5.0E-04	-0.02	47.3	2.33	7	78.0	102.4	180.4	26.3	38	60.2	1.0	-0.21	14.0	39.
83.00	5.0E-05	-0.03	41.4	3.31	6	68.7	192.0	260.7	32.6	38	56.5	6.0	-0.25	23.0	49.
83.17	5.0E-06	-0.04	31.3	4.03	6	52.7	210.9	263.7	39.9	UnDef	UnDef	6.0	UnDef	25.8	51.
83.33	5.0E-05	-0.04	26.2	3.71	6	44.5	178.1	222.6	41.7	36	44.1	6.0	-0.21	17.4	34.
83.50	5.0E-05	-0.05	24.7	3.59	6	42.2	168.7	210.9	42.2	34	42.5	6.0	-0.19	16.5	33.
83.66	5.0E-06	-0.05	20.8	4.14	4	36.0	144.1	180.1	47.8	UnDef	UnDef	6.0	UnDef	17.6	35.
83.82	5.0E-06	-0.07	15.8	3.85	1	28.2	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
83.99	5.0E-05	-0.09	13.0	3.20	4	23.7	94.8	118.5	53.2	32	30.0	6.0	-0.10	9.3	18.
84.15	5.0E-05	-0.09	11.9	3.19	4	22.0	88.1	110.2	55.1	30	30.0	3.0	-0.09	8.6	17.
84.32	5.0E-05	-0.08	13.1	2.79	6	23.9	95.5	119.4	51.0	32	30.0	6.0	-0.08	9.3	18.
84.48	5.0E-05	-0.08	14.2	3.00	4	25.6	102.5	128.1	50.4	32	30.0	6.0	-0.10	10.0	20.
84.64	5.0E-05	-0.08	14.1	3.24	4	25.6	102.3	127.9	51.7	32	30.0	6.0	-0.11	10.0	20.
84.81	5.0E-06	-0.08	13.7	3.49	4	25.0	99.9	124.9	53.5	UnDef	UnDef	6.0	UnDef	12.2	24.
84.97	5.0E-05	-0.08	14.1	3.24	4	25.6	102.3	127.8	51.7	32	30.0	6.0	-0.11	10.0	20.

Gregg In Situ, Inc.
Run No: 98-0720-1458-2827
CPT File: 124C01.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
85.14	5.0E-05	-0.07	15.4	3.11	6	27.6	110.5	138.2	49.2	32	30.4	6.0	-0.11	10.8	21.
85.30	5.0E-05	-0.06	16.1	3.12	6	28.9	115.6	144.4	48.2	32	31.7	6.0	-0.12	11.3	22.
85.46	5.0E-05	-0.07	14.0	3.24	4	25.5	102.0	127.6	51.8	32	30.0	6.0	-0.11	10.0	20.
85.63	5.0E-05	-0.08	12.4	3.19	4	22.9	91.5	114.4	54.3	30	30.0	3.0	-0.09	9.0	17.
85.79	5.0E-05	-0.08	12.7	3.09	4	23.5	93.9	117.3	53.2	32	30.0	6.0	-0.09	9.2	18.
85.96	5.0E-05	-0.08	12.9	3.31	4	23.8	95.0	118.8	54.0	32	30.0	6.0	-0.10	9.3	18.
86.12	5.0E-06	-0.08	13.3	3.89	1	24.5	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
86.29	5.0E-05	-0.06	18.4	2.82	6	32.6	130.5	163.1	44.1	32	35.2	6.0	-0.12	12.8	25.
86.45	5.0E-04	-0.04	24.7	2.35	6	42.9	171.5	214.3	36.2	34	43.0	1.0	-0.13	14.0	28.
86.61	5.0E-04	-0.04	27.2	2.09	6	46.9	140.2	187.1	33.1	36	45.6	1.0	-0.13	13.5	28.
86.78	5.0E-04	-0.04	25.9	2.52	6	44.8	179.3	224.2	36.3	36	44.3	1.0	-0.15	14.6	29.
86.94	5.0E-05	-0.05	20.9	3.34	6	36.8	147.3	184.1	44.2	34	38.6	6.0	-0.16	14.4	28.
87.11	5.0E-05	-0.06	16.0	3.37	4	28.9	115.6	144.4	49.7	32	31.7	6.0	-0.13	11.3	22.
87.27	5.0E-05	-0.08	12.2	2.61	6	22.8	91.2	114.0	51.5	30	30.0	3.0	-0.07	8.9	17.
87.43	5.0E-05	-0.10	10.7	2.19	6	20.4	81.5	101.8	51.8	30	30.0	3.0	-0.04	8.0	15.
87.60	5.0E-05	-0.10	10.2	2.04	6	19.6	78.3	97.9	51.9	30	30.0	3.0	-0.03	7.7	15.
87.76	5.0E-05	-0.10	9.8	2.16	6	18.9	75.7	94.7	53.7	30	30.0	3.0	-0.03	7.4	14.
87.93	5.0E-05	-0.10	10.2	2.00	6	19.6	78.4	98.0	51.6	30	30.0	3.0	-0.03	7.7	15.
88.09	5.0E-05	-0.10	10.0	1.99	6	19.4	77.5	96.8	51.9	30	30.0	3.0	-0.02	7.6	15.
88.25	5.0E-05	-0.10	10.0	1.99	6	19.4	77.6	97.0	51.8	30	30.0	3.0	-0.02	7.6	15.
88.42	5.0E-05	-0.09	10.0	2.06	6	19.4	77.7	97.1	52.3	30	30.0	3.0	-0.03	7.6	15.
88.58	5.0E-05	-0.09	10.2	2.10	6	19.6	78.6	98.2	52.3	30	30.0	3.0	-0.03	7.7	15.
88.75	5.0E-05	-0.09	10.2	2.25	6	19.8	79.2	98.9	53.2	30	30.0	3.0	-0.04	7.7	15.
88.91	5.0E-05	-0.09	10.4	2.45	4	20.1	80.5	100.6	54.0	30	30.0	3.0	-0.04	7.9	15.
89.07	5.0E-05	-0.08	11.6	2.50	6	22.1	88.3	110.4	51.9	30	30.0	3.0	-0.06	8.6	17.
89.24	5.0E-05	-0.08	12.1	2.67	4	22.8	91.4	114.2	52.0	30	30.0	3.0	-0.07	8.9	17.
89.40	5.0E-05	-0.08	12.1	2.85	4	22.9	91.5	114.4	53.0	30	30.0	3.0	-0.07	9.0	17.
89.57	5.0E-05	-0.07	12.4	2.97	4	23.4	93.7	117.2	53.1	32	30.0	3.0	-0.08	9.2	18.
89.73	5.0E-05	-0.07	13.1	3.04	4	24.5	98.0	122.6	52.3	32	30.0	6.0	-0.09	9.6	19.
89.89	5.0E-05	-0.07	13.4	2.98	4	25.1	100.4	125.5	51.4	32	30.0	6.0	-0.09	9.8	19.
90.06	5.0E-05	-0.07	13.4	3.02	4	25.0	100.1	125.1	51.7	32	30.0	6.0	-0.09	9.8	19.
90.22	5.0E-05	-0.07	13.5	3.07	4	25.4	101.4	126.8	51.7	32	30.0	6.0	-0.09	9.9	19.
90.39	5.0E-05	-0.07	13.5	3.32	4	25.3	101.1	126.4	53.0	32	30.0	6.0	-0.10	9.9	19.
90.55	5.0E-05	-0.06	14.1	3.28	4	26.2	104.9	131.2	51.9	32	30.0	6.0	-0.11	10.3	20.
90.71	5.0E-06	-0.06	14.2	3.52	4	26.4	105.8	132.2	53.0	UnDef	UnDef	6.0	UnDef	12.9	25.
90.88	5.0E-06	-0.06	14.9	4.14	1	27.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
91.04	5.0E-06	-0.05	16.1	4.25	1	29.7	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
91.21	5.0E-05	-0.04	19.6	3.48	6	35.5	142.2	177.7	46.0	34	37.6	6.0	-0.16	13.9	27.
91.37	5.0E-05	-0.04	20.3	3.05	6	36.6	146.5	183.1	43.4	34	38.5	6.0	-0.14	14.3	28.
91.53	5.0E-05	-0.04	19.7	2.90	6	35.8	143.0	178.8	43.1	34	37.8	6.0	-0.13	14.0	28.
91.70	5.0E-05	-0.05	17.5	3.20	6	32.1	128.5	160.6	47.0	32	34.7	6.0	-0.13	12.6	25.
91.86	5.0E-06	-0.05	15.2	3.72	4	28.3	113.1	141.3	52.3	UnDef	UnDef	6.0	UnDef	13.8	27.
92.03	5.0E-08	-0.06	13.9	5.76	1	26.2	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
92.19	1.0E-15	-0.04	18.2	5.77	1	33.2	UnDef	UnDef	100.0	32	35.7	1.0	-0.30	UnDef	UnDe
92.35	5.0E-05	-0.02	33.8	3.34	6	59.2	237.0	296.2	35.8	36	52.3	6.0	-0.22	23.2	46.
92.52	5.0E-04	-0.02	49.0	2.42	7	84.5	110.5	195.0	26.2	38	62.4	1.0	-0.21	15.1	42.
92.68	5.0E-04	-0.02	55.4	2.40	7	95.3	104.4	199.6	24.6	40	65.9	1.0	-0.23	15.1	46.
92.85	5.0E-04	-0.02	57.8	2.50	7	99.3	108.3	207.6	24.5	40	67.1	1.0	-0.24	15.7	48.
93.01	5.0E-04	-0.02	59.7	2.56	7	102.5	110.0	212.5	24.4	40	68.0	1.0	-0.24	16.0	49.
93.17	5.0E-04	-0.01	62.6	2.47	7	107.4	103.8	211.2	23.4	40	69.3	1.0	-0.24	15.6	50.
93.34	5.0E-04	-0.01	64.0	2.44	7	109.8	101.7	211.5	23.0	40	69.9	1.0	-0.24	15.4	51.
93.50	5.0E-04	-0.01	65.0	2.34	7	111.7	96.5	208.2	22.4	40	70.4	1.0	-0.24	14.9	51.
93.67	5.0E-04	-0.01	65.4	2.32	7	112.4	95.3	207.7	22.2	40	70.6	1.0	-0.24	14.8	51.
93.83	5.0E-04	-0.02	62.6	2.48	7	107.8	105.0	212.7	23.5	40	69.4	1.0	-0.25	15.7	50.

Gregg In Situ, Inc.
Run No: 98-0720-1458-2827
CPT File: 124C01.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
93.99	5.0E-04	-0.02	60.1	2.56	7	103.7	110.4	214.1	24.3	40	68.3	1.0	-0.25	16.1	49.
94.16	5.0E-04	-0.02	62.5	2.53	7	107.7	107.6	215.4	23.7	40	69.4	1.0	-0.25	16.0	51.
94.32	5.0E-04	-0.01	67.1	2.45	7	115.5	101.8	217.3	22.5	40	71.4	1.0	-0.25	15.6	53.
94.49	5.0E-04	-0.01	68.1	2.52	7	117.3	105.0	222.3	22.7	40	71.9	1.0	-0.26	16.0	54.
94.65	5.0E-04	-0.01	67.6	2.52	7	116.6	105.3	221.8	22.8	40	71.7	1.0	-0.26	16.1	54.
94.82	5.0E-04	-0.01	66.9	2.43	7	115.5	100.8	216.3	22.5	40	71.4	1.0	-0.25	15.5	53.
94.98	5.0E-04	-0.01	66.1	2.29	7	114.3	94.5	208.8	22.0	40	71.1	1.0	-0.24	14.7	52.
95.14	5.0E-04	-0.02	65.3	2.16	7	113.0	88.6	201.6	21.5	40	70.8	1.0	-0.23	14.0	50.
95.31	5.0E-03	-0.02	63.3	2.01	7	109.8	82.3	192.1	21.1	40	69.9	1.0	-0.22	9.8	36.
95.47	5.0E-03	-0.02	59.6	1.85	7	103.6	76.3	179.9	20.9	40	68.3	1.0	-0.20	9.2	34.
95.64	5.0E-03	-0.02	55.7	1.67	7	97.1	69.8	167.0	20.7	40	66.4	1.0	-0.18	8.4	32.
95.80	5.0E-03	-0.02	50.8	1.55	7	88.9	66.6	155.5	21.0	38	63.9	1.0	-0.17	8.0	29.
95.96	5.0E-03	-0.02	45.5	1.64	7	80.0	73.7	153.8	23.0	38	60.9	1.0	-0.16	8.4	28.
96.13	5.0E-04	-0.02	39.7	1.86	7	70.2	90.2	160.5	26.1	38	57.2	1.0	-0.16	12.4	35.
96.29	5.0E-04	-0.02	37.5	1.77	7	66.6	88.2	154.8	26.3	38	55.6	1.0	-0.15	12.0	33.
96.46	5.0E-03	-0.02	39.8	1.39	7	70.6	65.6	136.2	23.0	38	57.3	1.0	-0.13	7.4	24.
96.62	5.0E-04	-0.03	36.2	1.92	7	64.4	99.4	163.8	27.7	38	54.7	1.0	-0.15	12.9	33.
96.78	5.0E-05	-0.04	29.3	2.73	6	52.9	211.5	264.4	35.3	36	49.0	6.0	-0.17	20.7	41.
96.95	5.0E-06	-0.05	20.3	3.77	4	37.6	150.5	188.1	46.7	UnDef	UnDef	6.0	UnDef	18.4	36.
97.11	5.0E-05	-0.06	16.8	3.00	6	31.7	126.9	158.6	46.8	32	34.4	6.0	-0.12	12.4	24.
97.28	5.0E-05	-0.08	13.6	2.87	6	26.3	105.2	131.5	50.6	32	30.0	6.0	-0.09	10.3	20.
97.44	5.0E-06	-0.09	11.6	3.80	1	23.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
97.60	5.0E-05	-0.06	13.4	2.81	6	26.0	103.9	129.8	50.6	32	30.0	6.0	-0.08	10.2	20.
97.77	5.0E-05	-0.07	12.3	2.75	4	24.2	96.6	120.8	52.1	30	30.0	3.0	-0.07	9.5	18.
97.93	5.0E-05	-0.07	11.8	2.59	4	23.3	93.0	116.3	52.2	30	30.0	3.0	-0.06	9.1	18.
98.10	5.0E-05	-0.07	11.8	2.47	6	23.4	93.4	116.8	51.3	30	30.0	3.0	-0.06	9.1	18.
98.26	5.0E-05	-0.07	11.2	2.12	6	22.4	89.6	112.0	50.2	30	30.0	3.0	-0.04	8.8	17.
98.42	5.0E-04	-0.08	10.2	1.81	6	20.7	82.6	103.3	50.2	30	30.0	1.0	-0.02	6.7	13.
98.59	5.0E-05	-0.08	9.9	1.93	6	20.1	80.5	100.6	51.8	30	30.0	3.0	-0.02	7.9	15.
98.75	5.0E-05	-0.08	9.5	2.14	4	19.5	78.2	97.7	54.1	30	30.0	3.0	-0.02	7.7	15.
98.92	5.0E-05	-0.07	10.0	2.10	6	20.4	81.5	101.9	52.7	30	30.0	3.0	-0.03	8.0	16.
99.08	5.0E-05	-0.07	9.7	2.03	6	19.8	79.3	99.1	53.1	30	30.0	3.0	-0.02	7.8	15.
99.24	5.0E-05	-0.07	9.8	1.98	6	20.0	79.9	99.9	52.5	30	30.0	3.0	-0.02	7.8	15.
99.41	5.0E-05	-0.06	10.4	2.05	6	21.1	84.3	105.3	51.5	30	30.0	3.0	-0.03	8.2	16.
99.57	5.0E-05	-0.06	10.6	2.22	6	21.4	85.8	107.2	52.2	30	30.0	3.0	-0.03	8.4	16.
99.74	5.0E-05	-0.05	10.9	2.30	6	22.0	88.1	110.1	52.0	30	30.0	3.0	-0.04	8.6	17.
99.90	5.0E-05	-0.05	11.6	2.47	6	23.2	92.6	115.8	51.8	30	30.0	3.0	-0.05	9.1	18.
100.06	5.0E-05	-0.04	12.0	2.76	4	23.9	95.6	119.6	52.7	30	30.0	3.0	-0.07	9.4	18.
100.23	5.0E-06	-0.04	12.9	4.07	1	25.5	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
100.39	5.0E-06	-0.03	16.0	4.57	1	30.9	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
100.56	5.0E-06	-0.03	17.9	3.76	4	34.2	136.6	170.8	49.1	UnDef	UnDef	6.0	UnDef	16.7	33.
100.72	5.0E-06	-0.02	19.2	4.40	1	36.3	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
100.88	5.0E-06	-0.01	18.1	4.56	1	34.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
101.05	5.0E-06	-0.01	18.4	4.02	1	35.1	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
101.21	5.0E-05	-0.01	16.5	2.78	6	31.7	126.9	158.6	46.1	32	34.4	6.0	-0.10	12.4	24.
101.38	5.0E-04	-0.02	12.4	1.81	6	24.8	99.1	123.9	45.9	32	30.0	1.0	-0.03	8.1	16.
101.54	5.0E-04	-0.02	10.2	1.51	6	21.0	83.9	104.9	47.8	30	30.0	1.0	0.00	6.8	13.
101.70	5.0E-05	-0.01	8.6	1.79	6	18.2	72.8	91.0	54.0	30	30.0	3.0	0.01	7.1	14.
101.87	5.0E-05	0.00	9.1	2.05	4	19.0	76.0	95.0	54.7	30	30.0	3.0	-0.01	7.4	14.
102.03	5.0E-05	0.01	10.2	2.36	4	20.9	83.7	104.6	54.1	30	30.0	3.0	-0.03	8.2	16.
102.20	5.0E-05	0.02	10.5	2.79	4	21.6	86.4	108.0	55.8	30	30.0	3.0	-0.04	8.5	16.
102.36	5.0E-05	0.02	12.0	2.85	4	24.1	96.4	120.5	53.3	30	30.0	3.0	-0.06	9.4	18.
102.53	5.0E-05	0.02	12.4	3.08	4	24.9	99.4	124.3	53.7	32	30.0	3.0	-0.07	9.7	19.
102.69	5.0E-05	0.02	13.5	3.05	4	26.7	106.8	133.5	51.7	32	30.0	6.0	-0.08	10.5	20.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
102.85	5.0E-05	0.03	12.6	3.09	4	25.3	101.3	126.6	53.3	32	30.0	6.0	-0.07	9.9	19.
103.02	5.0E-06	0.05	11.8	3.94	1	23.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
103.18	5.0E-07	0.04	14.4	5.49	1	28.4	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
103.35	1.0E-15	0.02	16.5	5.83	1	32.1	UnDef	UnDef	100.0	32	34.7	1.0	-0.27	UnDef	UnDe
103.51	1.0E-15	-0.01	14.6	6.12	1	28.9	UnDef	UnDef	100.0	32	31.7	1.0	-0.27	UnDef	UnDe
103.67	1.0E-15	0.01	16.3	6.69	1	31.8	UnDef	UnDef	100.0	32	34.4	1.0	-0.38	UnDef	UnDe
103.84	1.0E-15	0.01	27.1	5.48	1	50.8	UnDef	UnDef	100.0	36	47.8	1.0	-0.35	UnDef	UnDe
104.00	5.0E-05	0.00	38.4	3.72	6	70.4	281.7	352.1	35.4	38	57.2	6.0	-0.26	27.6	55.
104.17	5.0E-05	-0.01	33.7	3.83	6	62.3	249.4	311.7	37.9	36	53.7	6.0	-0.25	24.4	48.
104.33	1.0E-15	-0.02	24.2	5.02	1	45.7	UnDef	UnDef	100.0	34	44.8	1.0	-0.28	UnDef	UnDe
104.49	1.0E-15	-0.02	24.6	4.72	1	46.4	UnDef	UnDef	100.0	34	45.3	1.0	-0.26	UnDef	UnDe
104.66	5.0E-06	-0.04	24.1	4.35	1	45.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
104.82	5.0E-06	-0.05	19.0	4.24	1	36.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
104.99	5.0E-06	-0.06	16.7	4.23	1	32.7	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
105.15	5.0E-06	-0.06	16.2	4.78	1	31.9	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
105.31	1.0E-15	-0.05	17.9	8.12	1	34.9	UnDef	UnDef	100.0	32	37.1	1.0	-1.24	UnDef	UnDe
105.48	1.0E-15	-0.05	19.8	8.32	1	38.2	UnDef	UnDef	100.0	34	39.7	1.0	-1.76	UnDef	UnDe
105.64	5.0E-03	-0.01	78.8	2.16	7	142.2	88.8	230.9	19.4	42	77.4	1.0	-0.25	11.0	45.
105.81	5.0E-03	-0.01	107.2	1.58	9	192.4	57.0	249.4	13.6	42	86.0	1.0	-0.24	7.8	54.

Gregg In Situ, Inc.

Interpretation Output - Release 1.00.17
Run No: 98-0720-1458-3332
Job No: 98-124
Client: NINYO & MOORE
Project: DEL MAR CA.
Site: GE
Location: CPT-2
Cone: ERIK OLSEN
CPT Date: 98/15/07
CPT Time: 10:58
CPT File: 124C02.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.05 (ft): 10.0
Su Nkt used: 12.50
Averaging Increment (m): 0.0 (Every Data Point)
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
0.16	8.5	0.10	1.18	0.9	5	114.6	0.01	0.01	0.00	2.00	4.1	8.1	0.68	0.00
0.33	21.9	0.10	0.46	0.4	7	117.8	0.02	0.02	0.00	2.00	7.0	14.0	UnDef	0.09
0.49	42.5	0.32	0.76	0.0	7	117.8	0.03	0.03	0.00	2.00	13.6	27.1	UnDef	0.13
0.66	43.1	0.46	1.07	-0.4	7	117.8	0.04	0.04	0.00	2.00	13.8	27.5	UnDef	0.13
0.82	33.3	0.44	1.32	0.2	7	117.8	0.05	0.05	0.00	2.00	10.6	21.3	UnDef	0.10
0.98	27.9	0.35	1.26	0.1	6	114.6	0.06	0.06	0.00	2.00	10.7	21.4	2.23	0.09
1.15	30.3	0.52	1.72	0.0	6	114.6	0.07	0.07	0.00	2.00	11.6	23.2	2.42	0.10
1.31	70.7	1.13	1.60	-0.2	7	117.8	0.08	0.08	0.00	2.00	22.6	45.1	UnDef	0.00
1.48	93.0	2.10	2.25	-0.6	7	117.8	0.09	0.09	0.00	2.00	29.7	59.4	UnDef	0.00
1.64	98.8	2.39	2.42	-0.8	7	117.8	0.10	0.10	0.00	2.00	31.5	63.1	UnDef	0.00
1.80	97.5	2.56	2.62	-1.0	6	114.6	0.11	0.11	0.00	2.00	37.4	74.7	7.79	0.00
1.97	98.3	2.51	2.55	-1.4	7	117.8	0.11	0.11	0.00	2.00	31.4	62.8	UnDef	0.00
2.13	89.8	2.43	2.70	-4.5	6	114.6	0.12	0.12	0.00	2.00	34.4	68.8	7.17	0.00
2.30	86.8	2.48	2.85	-5.1	6	114.6	0.13	0.13	0.00	2.00	33.3	66.5	6.93	0.00
2.46	83.5	2.47	2.95	-5.2	6	114.6	0.14	0.14	0.00	2.00	32.0	64.0	6.67	0.00
2.62	77.7	2.24	2.88	-5.3	6	114.6	0.15	0.15	0.00	2.00	29.7	59.5	6.20	0.00
2.79	70.2	1.94	2.77	-5.9	6	114.6	0.16	0.16	0.00	2.00	26.9	53.8	5.60	0.00
2.95	71.5	1.85	2.59	-6.2	6	114.6	0.17	0.17	0.00	2.00	27.4	54.8	5.71	0.00
3.12	73.6	1.90	2.59	-6.7	6	114.6	0.18	0.18	0.00	2.00	28.2	56.4	5.87	0.00
3.28	67.6	1.82	2.70	-6.9	6	114.6	0.19	0.19	0.00	2.00	25.9	51.8	5.39	0.00
3.44	62.7	1.68	2.69	-7.5	6	114.6	0.20	0.20	0.00	2.00	24.0	48.0	5.00	0.00
3.61	57.5	1.55	2.70	-7.8	6	114.6	0.21	0.21	0.00	2.00	22.0	44.1	4.58	0.00
3.77	52.7	1.41	2.68	-8.2	6	114.6	0.22	0.22	0.00	2.00	20.2	40.4	4.20	0.00
3.94	52.7	1.31	2.49	-8.7	6	114.6	0.23	0.23	0.00	2.00	20.2	40.4	4.20	0.26
4.10	57.0	1.31	2.30	-8.9	6	114.6	0.24	0.24	0.00	2.00	21.8	43.7	4.54	0.28
4.27	62.0	1.33	2.15	-9.0	7	117.8	0.25	0.25	0.00	2.00	19.8	39.6	UnDef	0.32
4.43	65.4	1.40	2.15	-9.2	7	117.8	0.26	0.26	0.00	1.98	20.9	41.2	UnDef	0.36
4.59	68.9	1.49	2.17	-9.5	7	117.8	0.27	0.27	0.00	1.94	22.0	42.7	UnDef	0.40
4.76	74.2	1.56	2.11	-9.7	7	117.8	0.28	0.28	0.00	1.91	23.7	45.1	UnDef	0.44
4.92	78.1	1.64	2.10	-9.7	7	117.8	0.29	0.29	0.00	1.87	24.9	46.7	UnDef	0.00
5.09	81.3	1.67	2.06	-9.8	7	117.8	0.29	0.29	0.00	1.84	26.0	47.8	UnDef	0.00
5.25	83.6	1.43	1.71	-9.9	7	117.8	0.30	0.30	0.00	1.81	26.7	48.4	UnDef	0.00

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
5.41	82.2	1.43	1.74	-10.0	7	117.8	0.31	0.31	0.00	1.78	26.2	46.8	UnDef	0.44
5.58	71.2	1.48	2.09	-10.6	7	117.8	0.32	0.32	0.00	1.76	22.7	39.9	UnDef	0.36
5.74	72.4	1.51	2.09	-10.5	7	117.8	0.33	0.33	0.00	1.73	23.1	40.0	UnDef	0.36
5.91	73.9	1.49	2.02	-10.5	7	117.8	0.34	0.34	0.00	1.71	23.6	40.3	UnDef	0.36
6.07	71.2	1.48	2.08	-10.5	7	117.8	0.35	0.35	0.00	1.68	22.7	38.3	UnDef	0.34
6.23	66.7	1.40	2.10	-10.5	7	117.8	0.36	0.36	0.00	1.66	21.3	35.4	UnDef	0.30
6.40	61.7	1.32	2.15	-10.5	7	117.8	0.37	0.37	0.00	1.64	19.7	32.3	UnDef	0.26
6.56	57.0	1.19	2.09	-10.8	7	117.8	0.38	0.38	0.00	1.62	18.2	29.4	UnDef	0.23
6.73	50.8	1.03	2.03	-10.9	6	114.6	0.39	0.39	0.00	1.60	19.5	31.1	4.04	0.19
6.89	43.9	0.87	1.98	-11.0	6	114.6	0.40	0.40	0.00	1.58	16.8	26.6	3.48	0.16
7.05	36.9	0.74	2.01	-11.2	6	114.6	0.41	0.41	0.00	1.56	14.1	22.1	2.92	0.14
7.22	28.4	0.62	2.19	-11.2	6	114.6	0.42	0.42	0.00	1.54	10.9	16.8	2.23	0.12
7.38	20.9	0.45	2.15	-11.3	6	114.6	0.43	0.43	0.00	1.53	8.0	12.2	1.64	0.11
7.55	12.8	0.25	1.95	-11.3	5	114.6	0.44	0.44	0.00	1.51	6.2	9.3	0.99	0.11
7.71	4.7	0.13	2.76	-11.2	3	111.4	0.45	0.45	0.00	1.49	4.5	6.8	0.34	0.08
7.87	4.4	0.06	1.36	-11.2	1	79.6	0.46	0.46	0.00	1.48	2.1	3.1	0.32	0.08
8.04	6.8	0.05	0.73	-11.1	1	79.6	0.46	0.46	0.00	1.47	3.3	4.8	0.51	0.09
8.20	6.1	0.07	1.15	-10.6	5	114.6	0.47	0.47	0.00	1.46	2.9	4.3	0.45	0.09
8.37	7.3	0.05	0.68	-10.5	1	79.6	0.48	0.48	0.00	1.45	3.5	5.1	0.55	0.09
8.53	4.5	0.05	1.12	-10.5	1	79.6	0.48	0.48	0.00	1.44	2.1	3.1	0.32	0.08
8.69	6.6	0.05	0.76	-9.7	1	79.6	0.49	0.49	0.00	1.43	3.2	4.5	0.49	0.09
8.86	8.5	0.05	0.59	-9.6	6	114.6	0.50	0.50	0.00	1.42	3.3	4.6	0.64	0.08
9.02	9.7	0.05	0.51	-9.4	6	114.6	0.51	0.51	0.00	1.40	3.7	5.2	0.74	0.08
9.19	12.1	0.05	0.41	-9.4	6	114.6	0.52	0.52	0.00	1.39	4.6	6.4	0.93	0.00
9.35	10.8	0.05	0.46	-9.2	6	114.6	0.53	0.53	0.00	1.38	4.1	5.7	0.82	0.00
9.51	9.6	0.05	0.52	-9.2	6	114.6	0.54	0.54	0.00	1.37	3.7	5.0	0.73	0.08
9.68	10.3	0.08	0.78	-9.1	6	114.6	0.55	0.55	0.00	1.35	3.9	5.3	0.78	0.09
9.84	9.0	0.07	0.78	-9.0	5	114.6	0.56	0.56	0.00	1.34	4.3	5.8	0.67	0.09
10.01	5.9	0.02	0.34	-8.9	1	79.6	0.56	0.56	0.00	1.33	2.8	3.8	0.43	0.09
10.17	3.3	0.05	1.53	-8.5	1	79.6	0.57	0.56	0.01	1.33	1.6	2.1	0.22	0.00
10.33	2.0	0.05	2.55	-8.4	3	111.4	0.58	0.57	0.01	1.33	1.9	2.5	0.11	0.00
10.50	2.0	0.05	2.55	-8.2	3	111.4	0.59	0.57	0.02	1.32	1.9	2.5	0.11	0.00
10.66	2.0	0.05	2.51	-10.5	3	111.4	0.60	0.58	0.02	1.32	1.9	2.5	0.11	0.00
10.83	1.9	0.05	2.57	-11.9	3	111.4	0.60	0.58	0.03	1.31	1.9	2.5	0.11	0.00
10.99	2.0	0.05	2.56	-10.4	3	111.4	0.61	0.58	0.03	1.31	1.9	2.5	0.11	0.00
11.15	2.0	0.05	2.55	-8.2	3	111.4	0.62	0.59	0.04	1.31	1.9	2.5	0.11	0.00
11.32	2.0	0.05	2.54	-6.4	3	111.4	0.63	0.59	0.04	1.30	1.9	2.5	0.11	0.00
11.48	2.0	0.05	2.54	-5.9	3	111.4	0.64	0.60	0.05	1.30	1.9	2.5	0.11	0.00
11.65	2.0	0.05	2.53	-5.3	3	111.4	0.65	0.60	0.05	1.29	1.9	2.4	0.11	0.00
11.81	2.0	0.05	2.53	-4.5	3	111.4	0.66	0.60	0.06	1.29	1.9	2.4	0.11	0.00
11.97	2.0	0.05	2.51	-2.0	3	111.4	0.67	0.61	0.06	1.28	1.9	2.5	0.11	0.00
12.14	2.0	0.05	2.51	-1.6	3	111.4	0.68	0.61	0.07	1.28	1.9	2.4	0.11	0.00
12.30	2.0	0.05	2.51	-1.5	3	111.4	0.69	0.62	0.07	1.27	1.9	2.4	0.10	0.00
12.47	2.0	0.05	2.51	-1.3	3	111.4	0.70	0.62	0.08	1.27	1.9	2.4	0.10	0.00
12.63	2.0	0.05	2.50	-0.8	3	111.4	0.71	0.62	0.08	1.27	1.9	2.4	0.10	0.00
12.80	2.0	0.05	2.46	-0.9	3	111.4	0.71	0.63	0.09	1.26	2.0	2.5	0.11	0.00
12.96	2.1	0.05	2.36	-0.5	3	111.4	0.72	0.63	0.09	1.26	2.0	2.6	0.11	0.00
13.12	2.9	0.05	1.75	-0.1	1	79.6	0.73	0.63	0.10	1.26	1.4	1.7	0.17	0.00
13.29	2.6	0.05	1.96	0.0	1	79.6	0.74	0.64	0.10	1.25	1.2	1.5	0.15	0.00
13.45	2.4	0.05	2.07	0.0	1	79.6	0.74	0.64	0.11	1.25	1.2	1.5	0.13	0.00
13.62	2.3	0.05	2.18	0.2	1	79.6	0.75	0.64	0.11	1.25	1.1	1.4	0.12	0.00
13.78	2.4	0.05	2.10	-0.3	1	79.6	0.76	0.64	0.12	1.25	1.1	1.4	0.13	0.00
13.94	2.8	0.05	1.77	-4.2	1	79.6	0.76	0.64	0.12	1.25	1.4	1.7	0.17	0.00
14.11	3.1	0.05	1.62	-3.8	1	79.6	0.77	0.64	0.13	1.25	1.5	1.8	0.19	0.00

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60	(N1)60 (blows/ft)	Su (tsf)	CRR
14.27	2.7	0.05	1.82	-3.7	1	79.6	0.78	0.64	0.13	1.25	1.3	1.6	0.16	0.00
14.44	2.8	0.05	1.80	-3.7	1	79.6	0.78	0.65	0.14	1.24	1.3	1.7	0.16	0.00
14.60	2.2	0.05	2.28	-3.2	3	111.4	0.79	0.65	0.14	1.24	2.1	2.6	0.11	0.00
14.76	2.0	0.05	2.52	-3.0	3	111.4	0.80	0.65	0.15	1.24	1.9	2.4	0.10	0.00
14.93	2.0	0.05	2.52	-2.8	3	111.4	0.81	0.66	0.15	1.23	1.9	2.4	0.09	0.00
15.09	2.0	0.05	2.51	-1.4	3	111.4	0.82	0.66	0.16	1.23	1.9	2.4	0.09	0.00
15.26	2.0	0.05	2.50	-0.8	3	111.4	0.83	0.66	0.16	1.23	1.9	2.4	0.09	0.00
15.42	2.0	0.05	2.50	0.0	3	111.4	0.84	0.67	0.17	1.22	1.9	2.3	0.09	0.00
15.58	2.9	0.05	1.75	0.4	1	79.6	0.85	0.67	0.17	1.22	1.4	1.7	0.16	0.00
15.75	3.5	0.05	1.42	0.6	1	79.6	0.85	0.67	0.18	1.22	1.7	2.1	0.22	0.00
15.91	3.8	0.05	1.32	0.8	1	79.6	0.86	0.67	0.18	1.22	1.8	2.2	0.23	0.00
16.08	4.8	0.05	1.05	0.8	1	79.6	0.86	0.68	0.19	1.22	2.3	2.8	0.31	0.00
16.24	5.4	0.05	0.93	0.8	1	79.6	0.87	0.68	0.19	1.22	2.6	3.2	0.36	0.08
16.40	5.5	0.05	0.90	1.4	1	79.6	0.88	0.68	0.20	1.21	2.7	3.2	0.37	0.08
16.57	5.0	0.05	1.00	1.4	1	79.6	0.88	0.68	0.21	1.21	2.4	2.9	0.33	0.00
16.73	4.8	0.05	1.04	1.4	1	79.6	0.89	0.68	0.21	1.21	2.3	2.8	0.31	0.00
16.90	4.9	0.05	1.02	1.3	1	79.6	0.90	0.68	0.22	1.21	2.4	2.8	0.32	0.00
17.06	4.5	0.05	1.11	1.5	1	79.6	0.90	0.68	0.22	1.21	2.2	2.6	0.29	0.00
17.22	4.0	0.05	1.25	1.5	1	79.6	0.91	0.68	0.23	1.21	1.9	2.3	0.25	0.00
17.39	4.1	0.05	1.21	1.5	1	79.6	0.92	0.69	0.23	1.21	2.0	2.4	0.26	0.00
17.55	4.3	0.05	1.16	1.6	1	79.6	0.92	0.69	0.24	1.21	2.1	2.5	0.27	0.00
17.72	4.6	0.05	1.09	2.1	1	79.6	0.93	0.69	0.24	1.20	2.2	2.7	0.29	0.00
17.88	4.3	0.05	1.16	2.3	1	79.6	0.94	0.69	0.25	1.20	2.1	2.5	0.27	0.00
18.04	4.3	0.05	1.17	2.3	1	79.6	0.94	0.69	0.25	1.20	2.0	2.5	0.27	0.00
18.21	4.5	0.05	1.11	2.4	1	79.6	0.95	0.69	0.26	1.20	2.2	2.6	0.29	0.00
18.37	4.3	0.05	1.16	3.7	1	79.6	0.96	0.69	0.26	1.20	2.1	2.5	0.27	0.00
18.54	4.8	0.05	1.04	3.7	1	79.6	0.96	0.70	0.27	1.20	2.3	2.8	0.31	0.00
18.70	5.6	0.05	0.89	3.9	1	79.6	0.97	0.70	0.27	1.20	2.7	3.2	0.37	0.08
18.86	6.7	0.05	0.75	4.3	1	79.6	0.98	0.70	0.28	1.20	3.2	3.8	0.46	0.09
19.03	7.2	0.05	0.69	4.3	1	79.6	0.98	0.70	0.28	1.20	3.5	4.1	0.50	0.09
19.19	7.6	0.05	0.66	4.6	5	114.6	0.99	0.70	0.29	1.19	3.7	4.4	0.53	0.09
19.36	7.6	0.05	0.66	5.0	1	79.6	1.00	0.71	0.29	1.19	3.6	4.3	0.53	0.09
19.52	8.7	0.05	0.58	5.2	6	114.6	1.01	0.71	0.30	1.19	3.3	4.0	0.62	0.09
19.68	8.7	0.05	0.57	5.6	6	114.6	1.02	0.71	0.30	1.18	3.3	4.0	0.62	0.09
19.85	8.9	0.05	0.56	5.9	6	114.6	1.02	0.72	0.31	1.18	3.4	4.0	0.63	0.09
20.01	9.5	0.05	0.53	6.0	6	114.6	1.03	0.72	0.31	1.18	3.6	4.3	0.68	0.10
20.18	10.0	0.05	0.50	6.1	6	114.6	1.04	0.73	0.32	1.17	3.8	4.5	0.72	0.09
20.34	10.8	0.04	0.37	6.7	6	114.6	1.05	0.73	0.32	1.17	4.1	4.8	0.78	0.00
20.51	12.1	0.05	0.41	6.7	6	114.6	1.06	0.73	0.33	1.17	4.6	5.4	0.89	0.00
20.67	14.4	0.08	0.56	7.3	6	114.6	1.07	0.74	0.33	1.16	5.5	6.4	1.07	0.09
20.83	16.3	0.11	0.68	7.6	6	114.6	1.08	0.74	0.34	1.16	6.2	7.2	1.21	0.09
21.00	18.4	0.14	0.76	7.9	6	114.6	1.09	0.75	0.34	1.16	7.1	8.2	1.39	0.09
21.16	22.3	0.17	0.77	8.3	6	114.6	1.10	0.75	0.35	1.15	8.5	9.8	1.69	0.09
21.33	26.4	0.22	0.84	8.4	7	117.8	1.11	0.76	0.35	1.15	8.4	9.7	UnDef	0.09
21.49	28.4	0.24	0.85	9.0	7	117.8	1.12	0.76	0.36	1.15	9.1	10.4	UnDef	0.09
21.65	30.2	0.21	0.70	9.4	7	117.8	1.13	0.77	0.36	1.14	9.6	11.0	UnDef	0.09
21.82	34.7	0.25	0.72	9.3	7	117.8	1.14	0.77	0.37	1.14	11.1	12.6	UnDef	0.10
21.98	35.1	0.29	0.83	12.0	7	117.8	1.15	0.77	0.37	1.14	11.2	12.7	UnDef	0.10
22.15	36.1	0.31	0.86	12.1	7	117.8	1.16	0.78	0.38	1.13	11.5	13.1	UnDef	0.10
22.31	36.3	0.33	0.91	12.6	7	117.8	1.17	0.78	0.38	1.13	11.6	13.1	UnDef	0.10
22.47	37.2	0.34	0.92	12.7	7	117.8	1.18	0.79	0.39	1.13	11.9	13.4	UnDef	0.10
22.64	40.8	0.38	0.93	13.0	7	117.8	1.19	0.79	0.39	1.12	13.0	14.6	UnDef	0.11
22.80	42.9	0.38	0.89	13.3	7	117.8	1.20	0.80	0.40	1.12	13.7	15.3	UnDef	0.11
22.97	44.8	0.37	0.83	13.5	7	117.8	1.21	0.80	0.40	1.12	14.3	16.0	UnDef	0.11

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
23.13	41.4	0.36	0.87	13.5	7	117.8	1.22	0.81	0.41	1.11	13.2	14.7	UnDef	0.11
23.29	37.9	0.34	0.90	13.6	7	117.8	1.23	0.81	0.42	1.11	12.1	13.4	UnDef	0.10
23.46	34.2	0.34	1.00	14.1	7	117.8	1.24	0.81	0.42	1.11	10.9	12.1	UnDef	0.10
23.62	34.3	0.33	0.97	14.1	7	117.8	1.24	0.82	0.43	1.10	10.9	12.1	UnDef	0.10
23.79	38.2	0.42	1.10	14.3	7	117.8	1.25	0.82	0.43	1.10	12.2	13.4	UnDef	0.11
23.95	32.9	0.65	1.98	14.4	6	114.6	1.26	0.83	0.44	1.10	12.6	13.9	2.53	0.15
24.11	15.5	0.52	3.37	14.3	4	114.6	1.27	0.83	0.44	1.10	9.9	10.8	1.14	0.13
24.28	10.0	0.35	3.51	15.0	3	111.4	1.28	0.84	0.45	1.09	9.6	10.5	0.70	0.00
24.44	8.8	0.20	2.27	18.3	5	114.6	1.29	0.84	0.45	1.09	4.2	4.6	0.60	0.09
24.61	7.4	0.15	2.04	26.1	4	114.6	1.30	0.85	0.46	1.09	4.7	5.1	0.48	0.09
24.77	6.2	0.11	1.77	36.3	4	114.6	1.31	0.85	0.46	1.09	4.0	4.3	0.39	0.08
24.93	6.2	0.03	0.48	45.3	1	79.6	1.32	0.85	0.47	1.08	3.0	3.2	0.39	0.08
25.10	5.9	0.13	2.23	49.1	4	114.6	1.33	0.86	0.47	1.08	3.7	4.0	0.36	0.00
25.26	6.5	0.26	4.01	62.0	3	111.4	1.34	0.86	0.48	1.08	6.2	6.7	0.41	0.00
25.43	24.2	0.44	1.83	68.2	6	114.6	1.35	0.86	0.48	1.08	9.3	10.0	1.83	0.16
25.59	43.4	0.84	1.94	25.6	6	114.6	1.35	0.87	0.49	1.07	16.6	17.8	3.36	0.16
25.75	32.9	0.98	2.98	20.2	5	114.6	1.36	0.87	0.49	1.07	15.8	16.9	2.53	0.38
25.92	16.8	0.78	4.65	19.6	3	111.4	1.37	0.88	0.50	1.07	16.1	17.2	1.24	0.00
26.08	11.7	0.45	3.85	20.1	3	111.4	1.38	0.88	0.50	1.07	11.2	12.0	0.83	0.00
26.25	10.2	0.36	3.55	25.4	3	111.4	1.39	0.88	0.51	1.06	9.7	10.4	0.70	0.00
26.41	11.1	0.51	4.61	31.2	3	111.4	1.40	0.89	0.51	1.06	10.6	11.3	0.78	0.00
26.57	41.8	0.84	2.01	34.7	6	114.6	1.41	0.89	0.52	1.06	16.0	17.0	3.23	0.16
26.74	37.0	0.92	2.49	22.9	6	114.6	1.42	0.90	0.52	1.06	14.2	15.0	2.85	0.22
26.90	33.5	0.88	2.63	22.4	6	114.6	1.43	0.90	0.53	1.05	12.8	13.5	2.57	0.27
27.07	29.0	0.71	2.46	20.6	6	114.6	1.44	0.91	0.53	1.05	11.1	11.7	2.20	0.29
27.23	27.4	0.53	1.94	16.4	6	114.6	1.45	0.91	0.54	1.05	10.5	11.0	2.07	0.18
27.39	26.2	0.62	2.37	6.6	6	114.6	1.46	0.91	0.54	1.05	10.0	10.5	1.98	0.30
27.56	25.1	0.57	2.27	8.1	6	114.6	1.47	0.92	0.55	1.04	9.6	10.0	1.89	0.28
27.72	34.7	0.60	1.74	7.5	6	114.6	1.48	0.92	0.55	1.04	13.3	13.8	2.65	0.14
27.89	40.1	0.73	1.82	4.5	6	114.6	1.49	0.93	0.56	1.04	15.4	16.0	3.09	0.15
28.05	41.1	0.82	2.00	4.3	6	114.6	1.49	0.93	0.56	1.04	15.8	16.3	3.17	0.16
28.21	45.6	0.88	1.93	4.5	6	114.6	1.50	0.94	0.57	1.03	17.5	18.1	3.53	0.16
28.38	48.9	1.01	2.07	3.7	6	114.6	1.51	0.94	0.57	1.03	18.7	19.3	3.79	0.18
28.54	52.5	1.19	2.27	8.7	6	114.6	1.52	0.94	0.58	1.03	20.1	20.7	4.08	0.21
28.71	68.5	1.21	1.77	3.7	7	117.8	1.53	0.95	0.58	1.03	21.9	22.5	UnDef	0.20
28.87	87.7	1.63	1.86	-2.3	7	117.8	1.54	0.95	0.59	1.02	28.0	28.7	UnDef	0.27
29.04	82.8	2.13	2.57	-5.8	6	114.6	1.55	0.96	0.59	1.02	31.7	32.4	6.50	0.35
29.20	54.3	2.10	3.86	-6.1	5	114.6	1.56	0.96	0.60	1.02	26.0	26.5	4.22	0.00
29.36	40.0	1.68	4.21	-6.2	4	114.6	1.57	0.97	0.60	1.02	25.5	26.0	3.08	0.00
29.53	49.4	1.25	2.54	-5.2	6	114.6	1.58	0.97	0.61	1.02	18.9	19.2	3.82	0.24
29.69	57.4	1.08	1.89	-7.6	7	117.8	1.59	0.97	0.61	1.01	18.3	18.6	UnDef	0.18
29.86	42.2	1.12	2.66	-9.7	6	114.6	1.60	0.98	0.62	1.01	16.2	16.3	3.25	0.27
30.02	30.5	1.17	3.84	-9.9	5	114.6	1.61	0.98	0.63	1.01	14.6	14.7	2.31	0.40
30.18	27.0	1.03	3.82	-9.7	4	114.6	1.62	0.99	0.63	1.01	17.2	17.4	2.03	0.30
30.35	24.9	0.88	3.54	-9.2	5	114.6	1.63	0.99	0.64	1.00	11.9	12.0	1.86	0.25
30.51	22.3	0.84	3.78	-9.2	4	114.6	1.64	1.00	0.64	1.00	14.2	14.2	1.65	0.20
30.68	22.1	0.84	3.80	-9.1	4	114.6	1.65	1.00	0.65	1.00	14.1	14.1	1.64	0.20
30.84	24.5	0.82	3.35	-9.1	5	114.6	1.66	1.00	0.65	1.00	11.7	11.7	1.83	0.24
31.00	24.6	0.79	3.22	-9.5	5	114.6	1.66	1.01	0.66	1.00	11.8	11.7	1.84	0.24
31.17	25.2	0.82	3.27	-9.8	5	114.6	1.67	1.01	0.66	0.99	12.1	12.0	1.88	0.25
31.33	31.4	0.92	2.93	-9.7	5	114.6	1.68	1.02	0.67	0.99	15.1	14.9	2.38	0.41
31.50	33.0	0.98	2.98	-9.7	5	114.6	1.69	1.02	0.67	0.99	15.8	15.6	2.50	0.46
31.66	30.6	0.80	2.62	-12.0	6	114.6	1.70	1.03	0.68	0.99	11.7	11.6	2.31	0.38
31.82	27.2	0.76	2.80	-12.4	5	114.6	1.71	1.03	0.68	0.99	13.0	12.9	2.04	0.29

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
31.99	17.8	0.80	4.51	-8.1	3	111.4	1.72	1.03	0.69	0.98	17.0	16.7	1.28	0.00
32.15	13.7	0.66	4.82	-8.2	3	111.4	1.73	1.04	0.69	0.98	13.1	12.9	0.96	0.00
32.32	28.7	0.91	3.18	-7.5	5	114.6	1.74	1.04	0.70	0.98	13.7	13.4	2.15	0.32
32.48	22.4	0.96	4.29	-8.5	3	111.4	1.75	1.05	0.70	0.98	21.5	21.0	1.66	0.00
32.64	15.5	0.88	5.69	-8.2	3	111.4	1.76	1.05	0.71	0.98	14.9	14.5	1.10	0.00
32.81	21.6	0.86	3.98	-7.5	4	114.6	1.77	1.05	0.71	0.97	13.8	13.5	1.59	0.00
32.97	23.2	0.89	3.85	-8.2	4	114.6	1.78	1.06	0.72	0.97	14.8	14.4	1.71	0.00
33.14	20.6	0.77	3.75	-9.0	4	114.6	1.79	1.06	0.72	0.97	13.2	12.8	1.51	0.00
33.30	17.9	0.66	3.69	-10.3	4	114.6	1.79	1.07	0.73	0.97	11.4	11.1	1.29	0.00
33.46	12.5	0.58	4.65	-10.5	3	111.4	1.80	1.07	0.73	0.97	12.0	11.6	0.86	0.00
33.63	11.3	0.53	4.69	-10.3	3	111.4	1.81	1.08	0.74	0.96	10.8	10.5	0.76	0.00
33.79	9.6	0.48	5.02	-10.0	3	111.4	1.82	1.08	0.74	0.96	9.2	8.8	0.62	0.00
33.96	12.0	0.51	4.26	-9.8	3	111.4	1.83	1.08	0.75	0.96	11.5	11.0	0.81	0.00
34.12	14.6	0.47	3.23	-9.3	4	114.6	1.84	1.09	0.75	0.96	9.3	8.9	1.02	0.00
34.28	11.0	0.43	3.93	-9.9	3	111.4	1.85	1.09	0.76	0.96	10.5	10.1	0.73	0.00
34.45	9.6	0.33	3.45	-9.6	3	111.4	1.86	1.10	0.76	0.96	9.2	8.8	0.62	0.00
34.61	7.7	0.28	3.64	-9.1	3	111.4	1.87	1.10	0.77	0.95	7.4	7.0	0.47	0.00
34.78	7.5	0.28	3.74	-9.0	3	111.4	1.88	1.10	0.77	0.95	7.2	6.8	0.45	0.00
34.94	8.0	0.20	2.49	-8.5	4	114.6	1.89	1.11	0.78	0.95	5.1	4.9	0.49	0.00
35.10	7.3	0.19	2.60	-8.2	4	114.6	1.90	1.11	0.78	0.95	4.7	4.4	0.43	0.00
35.27	7.2	0.19	2.64	-6.0	4	114.6	1.91	1.12	0.79	0.95	4.6	4.4	0.42	0.00
35.43	7.6	0.29	3.83	-5.4	3	111.4	1.91	1.12	0.79	0.94	7.3	6.9	0.45	0.00
35.60	10.1	0.40	3.97	-5.2	3	111.4	1.92	1.12	0.80	0.94	9.7	9.1	0.65	0.00
35.76	11.1	0.48	4.32	-5.3	3	111.4	1.93	1.13	0.80	0.94	10.7	10.0	0.74	0.00
35.92	13.6	0.41	3.02	-5.2	5	114.6	1.94	1.13	0.81	0.94	6.5	6.1	0.93	0.00
36.09	10.8	0.34	3.15	-5.2	4	114.6	1.95	1.14	0.81	0.94	6.9	6.5	0.71	0.00
36.25	7.9	0.30	3.83	-5.2	3	111.4	1.96	1.14	0.82	0.94	7.5	7.0	0.47	0.00
36.42	8.1	0.29	3.60	-4.7	3	111.4	1.97	1.15	0.82	0.93	7.7	7.2	0.49	0.00
36.58	7.9	0.29	3.66	-4.5	3	111.4	1.98	1.15	0.83	0.93	7.6	7.1	0.48	0.00
36.74	7.8	0.28	3.59	-3.8	3	111.4	1.99	1.15	0.84	0.93	7.5	7.0	0.47	0.00
36.91	7.9	0.28	3.53	-3.7	3	111.4	2.00	1.16	0.84	0.93	7.6	7.1	0.48	0.00
37.07	7.9	0.27	3.44	-3.4	3	111.4	2.01	1.16	0.85	0.93	7.5	7.0	0.47	0.00
37.24	7.9	0.26	3.31	-3.0	3	111.4	2.02	1.17	0.85	0.93	7.5	7.0	0.47	0.00
37.40	8.1	0.25	3.09	-2.9	4	114.6	2.03	1.17	0.86	0.92	5.2	4.8	0.49	0.00
37.57	7.4	0.22	2.97	-2.5	4	114.6	2.03	1.17	0.86	0.92	4.7	4.4	0.43	0.00
37.73	7.1	0.19	2.70	-2.2	4	114.6	2.04	1.18	0.87	0.92	4.5	4.2	0.40	0.00
37.89	6.9	0.17	2.47	-1.8	4	114.6	2.05	1.18	0.87	0.92	4.4	4.0	0.39	0.00
38.06	6.8	0.17	2.52	-1.5	4	114.6	2.06	1.19	0.88	0.92	4.3	4.0	0.38	0.00
38.22	6.8	0.10	1.47	-1.3	5	114.6	2.07	1.19	0.88	0.92	3.3	3.0	0.38	0.08
38.39	6.7	0.10	1.49	-0.9	5	114.6	2.08	1.20	0.89	0.91	3.2	2.9	0.37	0.08
38.55	6.7	0.10	1.50	0.6	5	114.6	2.09	1.20	0.89	0.91	3.2	2.9	0.37	0.00
38.71	6.6	0.10	1.51	0.8	5	114.6	2.10	1.20	0.90	0.91	3.2	2.9	0.36	0.00
38.88	6.6	0.10	1.53	1.2	5	114.6	2.11	1.21	0.90	0.91	3.1	2.9	0.36	0.00
39.04	6.4	0.11	1.74	1.4	4	114.6	2.12	1.21	0.91	0.91	4.1	3.7	0.34	0.00
39.21	6.7	0.12	1.80	1.7	5	114.6	2.13	1.22	0.91	0.91	3.2	2.9	0.37	0.00
39.37	7.2	0.12	1.67	1.7	5	114.6	2.14	1.22	0.92	0.91	3.5	3.1	0.41	0.08
39.53	6.7	0.11	1.65	2.1	5	114.6	2.15	1.23	0.92	0.90	3.2	2.9	0.36	0.00
39.70	6.7	0.11	1.64	2.3	5	114.6	2.16	1.23	0.93	0.90	3.2	2.9	0.37	0.00
39.86	7.2	0.14	1.96	2.7	4	114.6	2.17	1.23	0.93	0.90	4.6	4.1	0.40	0.00
40.03	7.6	0.16	2.12	3.0	4	114.6	2.18	1.24	0.94	0.90	4.8	4.3	0.43	0.00
40.19	7.6	0.19	2.51	3.0	4	114.6	2.18	1.24	0.94	0.90	4.8	4.3	0.43	0.00
40.35	7.5	0.18	2.42	3.6	4	114.6	2.19	1.25	0.95	0.90	4.8	4.3	0.42	0.00
40.52	9.9	0.15	1.51	4.0	5	114.6	2.20	1.25	0.95	0.89	4.8	4.3	0.62	0.09
40.68	7.5	0.13	1.73	4.1	5	114.6	2.21	1.26	0.96	0.89	3.6	3.2	0.42	0.08

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60	(N1)60 (blows/ft)	Su (tsf)	CRR
40.85	6.4	0.10	1.57	4.3	5	114.6	2.22	1.26	0.96	0.89	3.0	2.7	0.33	0.00
41.01	6.7	0.10	1.50	4.9	5	114.6	2.23	1.26	0.97	0.89	3.2	2.8	0.35	0.00
41.17	6.7	0.10	1.49	4.9	5	114.6	2.24	1.27	0.97	0.89	3.2	2.9	0.36	0.00
41.34	6.4	0.08	1.26	5.1	5	114.6	2.25	1.27	0.98	0.89	3.0	2.7	0.33	0.00
41.50	6.3	0.07	1.11	5.4	5	114.6	2.26	1.28	0.98	0.89	3.0	2.7	0.33	0.00
41.67	6.5	0.07	1.08	6.5	5	114.6	2.27	1.28	0.99	0.88	3.1	2.8	0.34	0.00
41.83	6.5	0.07	1.08	6.8	5	114.6	2.28	1.29	0.99	0.88	3.1	2.7	0.34	0.00
41.99	6.5	0.08	1.22	6.7	5	114.6	2.29	1.29	1.00	0.88	3.1	2.8	0.34	0.00
42.16	6.4	0.09	1.41	7.5	5	114.6	2.30	1.29	1.00	0.88	3.1	2.7	0.33	0.00
42.32	7.2	0.11	1.52	7.3	5	114.6	2.31	1.30	1.01	0.88	3.5	3.0	0.39	0.08
42.49	6.9	0.10	1.45	7.6	5	114.6	2.32	1.30	1.01	0.88	3.3	2.9	0.37	0.00
42.65	6.8	0.08	1.19	7.7	5	114.6	2.33	1.31	1.02	0.87	3.2	2.8	0.35	0.00
42.81	6.8	0.08	1.19	8.1	5	114.6	2.34	1.31	1.02	0.87	3.2	2.8	0.35	0.00
42.98	7.0	0.08	1.15	8.5	5	114.6	2.34	1.32	1.03	0.87	3.3	2.9	0.37	0.00
43.14	6.7	0.07	1.04	8.9	5	114.6	2.35	1.32	1.03	0.87	3.2	2.8	0.35	0.00
43.31	6.8	0.07	1.04	9.0	5	114.6	2.36	1.32	1.04	0.87	3.2	2.8	0.35	0.00
43.47	6.9	0.07	1.01	9.2	5	114.6	2.37	1.33	1.05	0.87	3.3	2.9	0.37	0.00
43.63	6.9	0.07	1.02	9.8	5	114.6	2.38	1.33	1.05	0.87	3.3	2.8	0.36	0.00
43.80	6.8	0.08	1.18	9.7	5	114.6	2.39	1.34	1.06	0.87	3.2	2.8	0.35	0.00
43.96	7.1	0.07	0.99	10.4	5	114.6	2.40	1.34	1.06	0.86	3.4	2.9	0.37	0.00
44.13	7.0	0.08	1.15	10.5	5	114.6	2.41	1.35	1.07	0.86	3.3	2.9	0.37	0.00
44.29	7.2	0.08	1.12	10.5	5	114.6	2.42	1.35	1.07	0.86	3.4	3.0	0.38	0.08
44.45	7.2	0.07	0.97	11.1	5	114.6	2.43	1.35	1.08	0.86	3.5	3.0	0.38	0.08
44.62	7.1	0.07	0.99	11.2	5	114.6	2.44	1.36	1.08	0.86	3.4	2.9	0.37	0.00
44.78	6.8	0.08	1.17	11.3	5	114.6	2.45	1.36	1.09	0.86	3.3	2.8	0.35	0.00
44.95	7.2	0.08	1.11	12.8	5	114.6	2.46	1.37	1.09	0.86	3.5	3.0	0.38	0.08
45.11	7.3	0.08	1.10	13.0	5	114.6	2.47	1.37	1.10	0.85	3.5	3.0	0.38	0.08
45.28	7.4	0.08	1.09	13.5	5	114.6	2.48	1.37	1.10	0.85	3.5	3.0	0.39	0.08
45.44	7.4	0.08	1.08	13.8	5	114.6	2.49	1.38	1.11	0.85	3.5	3.0	0.39	0.08
45.60	7.3	0.08	1.09	14.1	5	114.6	2.50	1.38	1.11	0.85	3.5	3.0	0.39	0.08
45.77	7.2	0.14	1.94	14.2	5	114.6	2.50	1.39	1.12	0.85	3.5	2.9	0.38	0.00
45.93	7.6	0.83	10.94	14.9	2	111.4	2.51	1.39	1.12	0.85	7.3	6.2	0.41	0.00
46.10	15.2	0.68	4.49	15.3	3	111.4	2.52	1.40	1.13	0.85	14.5	12.3	1.01	0.00
46.26	9.6	0.34	3.56	5.2	3	111.4	2.53	1.40	1.13	0.85	9.2	7.7	0.56	0.00
46.42	9.0	0.14	1.56	6.0	5	114.6	2.54	1.40	1.14	0.84	4.3	3.6	0.52	0.08
46.59	8.7	0.15	1.72	7.1	5	114.6	2.55	1.41	1.14	0.84	4.2	3.5	0.49	0.08
46.75	6.8	0.16	2.37	7.7	4	114.6	2.56	1.41	1.15	0.84	4.3	3.6	0.34	0.00
46.92	7.0	0.15	2.16	7.9	4	114.6	2.57	1.42	1.15	0.84	4.5	3.7	0.35	0.00
47.08	6.6	0.14	2.11	8.2	4	114.6	2.58	1.42	1.16	0.84	4.2	3.6	0.33	0.00
47.24	7.0	0.14	2.00	8.6	4	114.6	2.59	1.43	1.16	0.84	4.5	3.8	0.36	0.00
47.41	7.0	0.15	2.15	9.4	4	114.6	2.60	1.43	1.17	0.84	4.5	3.7	0.35	0.00
47.57	7.2	0.15	2.08	9.8	4	114.6	2.61	1.43	1.17	0.84	4.6	3.9	0.37	0.00
47.74	7.6	0.14	1.85	10.0	5	114.6	2.62	1.44	1.18	0.83	3.6	3.0	0.40	0.00
47.90	7.0	0.12	1.72	10.1	5	114.6	2.63	1.44	1.18	0.83	3.3	2.8	0.35	0.00
48.06	7.5	0.12	1.60	10.9	5	114.6	2.64	1.45	1.19	0.83	3.6	3.0	0.39	0.08
48.23	7.3	0.12	1.65	12.7	5	114.6	2.64	1.45	1.19	0.83	3.5	2.9	0.37	0.00
48.39	7.2	0.12	1.67	13.4	5	114.6	2.65	1.46	1.20	0.83	3.5	2.9	0.37	0.00
48.56	7.2	0.12	1.68	13.5	5	114.6	2.66	1.46	1.20	0.83	3.4	2.8	0.36	0.00
48.72	7.5	0.11	1.48	14.0	5	114.6	2.67	1.46	1.21	0.83	3.6	3.0	0.38	0.08
48.88	7.4	0.11	1.48	14.3	5	114.6	2.68	1.47	1.21	0.83	3.6	2.9	0.38	0.08
49.05	7.6	0.11	1.46	14.9	5	114.6	2.69	1.47	1.22	0.82	3.6	3.0	0.39	0.08
49.21	7.5	0.11	1.47	15.0	5	114.6	2.70	1.48	1.22	0.82	3.6	2.9	0.38	0.08
49.38	7.5	0.11	1.47	15.1	5	114.6	2.71	1.48	1.23	0.82	3.6	2.9	0.38	0.08
49.54	7.4	0.11	1.49	15.7	5	114.6	2.72	1.49	1.23	0.82	3.5	2.9	0.37	0.00

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
49.70	7.4	0.11	1.49	16.1	5	114.6	2.73	1.49	1.24	0.82	3.5	2.9	0.37	0.00
49.87	7.2	0.11	1.54	16.1	5	114.6	2.74	1.49	1.24	0.82	3.4	2.8	0.36	0.00
50.03	7.2	0.11	1.53	16.6	5	114.6	2.75	1.50	1.25	0.82	3.4	2.8	0.35	0.00
50.20	7.6	0.11	1.46	16.9	5	114.6	2.76	1.50	1.26	0.82	3.6	3.0	0.39	0.08
50.36	7.5	0.11	1.47	17.5	5	114.6	2.77	1.51	1.26	0.81	3.6	2.9	0.38	0.00
50.52	7.3	0.12	1.65	17.7	5	114.6	2.78	1.51	1.27	0.81	3.5	2.8	0.36	0.00
50.69	8.0	0.12	1.50	18.1	5	114.6	2.79	1.52	1.27	0.81	3.9	3.1	0.42	0.08
50.85	7.6	0.12	1.59	18.6	5	114.6	2.80	1.52	1.28	0.81	3.6	2.9	0.38	0.08
51.02	7.4	0.10	1.36	18.8	5	114.6	2.80	1.52	1.28	0.81	3.5	2.9	0.36	0.00
51.18	7.5	0.10	1.33	19.6	5	114.6	2.81	1.53	1.29	0.81	3.6	2.9	0.38	0.00
51.34	7.3	0.10	1.37	19.8	5	114.6	2.82	1.53	1.29	0.81	3.5	2.8	0.36	0.00
51.51	7.8	0.11	1.41	20.4	5	114.6	2.83	1.54	1.30	0.81	3.7	3.0	0.40	0.08
51.67	7.9	0.11	1.40	22.4	5	114.6	2.84	1.54	1.30	0.81	3.8	3.0	0.40	0.08
51.84	7.8	0.11	1.42	23.1	5	114.6	2.85	1.55	1.31	0.80	3.7	3.0	0.39	0.08
52.00	7.8	0.10	1.28	23.5	5	114.6	2.86	1.55	1.31	0.80	3.7	3.0	0.40	0.08
52.16	7.9	0.10	1.28	24.0	5	114.6	2.87	1.55	1.32	0.80	3.8	3.0	0.40	0.08
52.33	8.0	0.10	1.25	24.4	5	114.6	2.88	1.56	1.32	0.80	3.8	3.1	0.41	0.08
52.49	8.0	0.11	1.38	24.8	5	114.6	2.89	1.56	1.33	0.80	3.8	3.1	0.41	0.08
52.66	7.7	0.11	1.43	25.3	5	114.6	2.90	1.57	1.33	0.80	3.7	3.0	0.39	0.08
52.82	8.0	0.12	1.50	26.1	5	114.6	2.91	1.57	1.34	0.80	3.8	3.1	0.41	0.08
52.98	8.0	0.12	1.50	26.3	5	114.6	2.92	1.58	1.34	0.80	3.9	3.1	0.41	0.08
53.15	8.1	0.12	1.49	27.1	5	114.6	2.93	1.58	1.35	0.80	3.9	3.1	0.41	0.08
53.31	8.5	0.11	1.30	27.6	5	114.6	2.94	1.58	1.35	0.79	4.1	3.2	0.44	0.08
53.48	8.5	0.11	1.30	28.1	5	114.6	2.95	1.59	1.36	0.79	4.1	3.2	0.44	0.08
53.64	8.4	0.12	1.44	28.3	5	114.6	2.95	1.59	1.36	0.79	4.0	3.2	0.43	0.08
53.81	8.2	0.12	1.46	28.6	5	114.6	2.96	1.60	1.37	0.79	3.9	3.1	0.42	0.08
53.97	8.4	0.12	1.43	29.9	5	114.6	2.97	1.60	1.37	0.79	4.0	3.2	0.43	0.08
54.13	8.5	0.12	1.41	30.2	5	114.6	2.98	1.61	1.38	0.79	4.1	3.2	0.44	0.08
54.30	8.5	0.11	1.30	30.4	5	114.6	2.99	1.61	1.38	0.79	4.1	3.2	0.44	0.08
54.46	8.5	0.12	1.42	31.1	5	114.6	3.00	1.61	1.39	0.79	4.1	3.2	0.44	0.08
54.63	8.6	0.12	1.40	32.3	5	114.6	3.01	1.62	1.39	0.79	4.1	3.2	0.45	0.08
54.79	8.8	0.13	1.48	35.4	5	114.6	3.02	1.62	1.40	0.79	4.2	3.3	0.46	0.08
54.95	8.6	0.13	1.52	36.2	5	114.6	3.03	1.63	1.40	0.78	4.1	3.2	0.44	0.08
55.12	8.9	0.13	1.46	36.7	5	114.6	3.04	1.63	1.41	0.78	4.3	3.4	0.47	0.08
55.28	9.0	0.13	1.45	37.4	5	114.6	3.05	1.63	1.41	0.78	4.3	3.4	0.48	0.08
55.45	9.0	0.12	1.33	38.1	5	114.6	3.06	1.64	1.42	0.78	4.3	3.4	0.48	0.08
55.61	9.4	0.11	1.18	38.9	5	114.6	3.07	1.64	1.42	0.78	4.5	3.5	0.51	0.08
55.77	8.9	0.11	1.24	39.6	5	114.6	3.08	1.65	1.43	0.78	4.3	3.3	0.46	0.08
55.94	9.0	0.12	1.34	40.4	5	114.6	3.09	1.65	1.43	0.78	4.3	3.4	0.47	0.08
56.10	8.9	0.13	1.46	41.1	5	114.6	3.10	1.66	1.44	0.78	4.3	3.3	0.47	0.08
56.27	9.1	0.12	1.33	41.9	5	114.6	3.11	1.66	1.44	0.78	4.3	3.4	0.48	0.08
56.43	8.8	0.13	1.48	42.3	5	114.6	3.11	1.66	1.45	0.78	4.2	3.3	0.45	0.08
56.59	9.0	0.13	1.45	43.2	5	114.6	3.12	1.67	1.45	0.77	4.3	3.3	0.47	0.08
56.76	9.0	0.13	1.44	44.5	5	114.6	3.13	1.67	1.46	0.77	4.3	3.3	0.47	0.08
56.92	9.5	0.13	1.37	45.4	5	114.6	3.14	1.68	1.47	0.77	4.5	3.5	0.51	0.08
57.09	8.8	0.12	1.36	46.4	5	114.6	3.15	1.68	1.47	0.77	4.2	3.3	0.45	0.08
57.25	9.2	0.22	2.40	47.8	5	114.6	3.16	1.69	1.48	0.77	4.4	3.4	0.48	0.00
57.41	9.2	0.28	3.05	49.1	4	114.6	3.17	1.69	1.48	0.77	5.9	4.5	0.48	0.00
57.58	14.8	0.31	2.10	55.6	5	114.6	3.18	1.69	1.49	0.77	7.1	5.5	0.93	0.10
57.74	8.9	0.30	3.37	14.5	3	111.4	3.19	1.70	1.49	0.77	8.6	6.6	0.46	0.00
57.91	10.0	0.21	2.11	16.0	5	114.6	3.20	1.70	1.50	0.77	4.8	3.7	0.54	0.00
58.07	9.9	0.20	2.03	21.0	5	114.6	3.21	1.71	1.50	0.77	4.7	3.6	0.53	0.00
58.23	9.2	0.20	2.18	21.7	5	114.6	3.22	1.71	1.51	0.76	4.4	3.4	0.48	0.00
58.40	9.4	0.19	2.03	22.4	5	114.6	3.23	1.72	1.51	0.76	4.5	3.4	0.49	0.00

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
58.56	9.4	0.20	2.13	23.1	5	114.6	3.24	1.72	1.52	0.76	4.5	3.4	0.50	0.00
58.73	9.6	0.19	1.99	23.8	5	114.6	3.25	1.72	1.52	0.76	4.6	3.5	0.51	0.00
58.89	9.6	0.19	1.98	24.6	5	114.6	3.26	1.73	1.53	0.76	4.6	3.5	0.51	0.00
59.05	9.8	0.20	2.05	25.1	5	114.6	3.26	1.73	1.53	0.76	4.7	3.6	0.52	0.00
59.22	10.0	0.21	2.10	25.7	5	114.6	3.27	1.74	1.54	0.76	4.8	3.6	0.54	0.00
59.38	10.1	0.20	1.99	26.3	5	114.6	3.28	1.74	1.54	0.76	4.8	3.7	0.54	0.00
59.55	10.7	0.20	1.88	27.0	5	114.6	3.29	1.75	1.55	0.76	5.1	3.9	0.59	0.09
59.71	10.6	0.20	1.89	27.7	5	114.6	3.30	1.75	1.55	0.76	5.1	3.8	0.58	0.00
59.87	10.6	0.19	1.80	28.3	5	114.6	3.31	1.75	1.56	0.76	5.1	3.8	0.58	0.09
60.04	10.4	0.17	1.64	28.9	5	114.6	3.32	1.76	1.56	0.75	5.0	3.8	0.57	0.09
60.20	10.3	0.19	1.85	29.4	5	114.6	3.33	1.76	1.57	0.75	4.9	3.7	0.56	0.00
60.37	10.1	0.21	2.08	29.9	5	114.6	3.34	1.77	1.57	0.75	4.8	3.6	0.54	0.00
60.53	11.0	0.24	2.19	30.7	5	114.6	3.35	1.77	1.58	0.75	5.3	4.0	0.61	0.00
60.69	11.6	0.25	2.15	31.4	5	114.6	3.36	1.78	1.58	0.75	5.6	4.2	0.66	0.00
60.86	12.0	0.24	2.01	32.3	5	114.6	3.37	1.78	1.59	0.75	5.7	4.3	0.69	0.09
61.02	11.2	0.26	2.32	33.1	5	114.6	3.38	1.78	1.59	0.75	5.4	4.0	0.63	0.00
61.19	12.7	0.24	1.89	38.8	5	114.6	3.39	1.79	1.60	0.75	6.1	4.5	0.75	0.09
61.35	10.8	0.23	2.13	40.3	5	114.6	3.40	1.79	1.60	0.75	5.2	3.9	0.60	0.00
61.52	11.1	0.24	2.16	41.8	5	114.6	3.41	1.80	1.61	0.75	5.3	4.0	0.62	0.00
61.68	10.8	0.24	2.23	42.8	5	114.6	3.42	1.80	1.61	0.75	5.2	3.9	0.59	0.00
61.84	10.3	0.23	2.23	44.4	5	114.6	3.42	1.81	1.62	0.74	5.0	3.7	0.55	0.00
62.01	10.3	0.23	2.23	45.6	5	114.6	3.43	1.81	1.62	0.74	5.0	3.7	0.55	0.00
62.17	11.0	0.22	2.01	46.6	5	114.6	3.44	1.81	1.63	0.74	5.2	3.9	0.60	0.00
62.34	11.0	0.21	1.91	47.7	5	114.6	3.45	1.82	1.63	0.74	5.3	3.9	0.61	0.00
62.50	10.8	0.22	2.04	48.7	5	114.6	3.46	1.82	1.64	0.74	5.2	3.8	0.59	0.00
62.66	11.1	0.22	2.00	50.1	5	114.6	3.47	1.83	1.64	0.74	5.3	3.9	0.61	0.00
62.83	11.3	0.21	1.86	51.6	5	114.6	3.48	1.83	1.65	0.74	5.4	4.0	0.63	0.09
62.99	11.3	0.19	1.68	53.2	5	114.6	3.49	1.84	1.65	0.74	5.4	4.0	0.63	0.09
63.16	11.4	0.19	1.67	54.6	5	114.6	3.50	1.84	1.66	0.74	5.5	4.0	0.63	0.09
63.32	11.8	0.27	2.29	56.0	5	114.6	3.51	1.84	1.66	0.74	5.7	4.2	0.66	0.00
63.48	12.8	0.29	2.27	57.8	5	114.6	3.52	1.85	1.67	0.74	6.1	4.5	0.74	0.00
63.65	13.4	0.42	3.15	60.1	4	114.6	3.53	1.85	1.68	0.73	8.5	6.3	0.79	0.00
63.81	16.5	0.68	4.14	61.8	3	111.4	3.54	1.86	1.68	0.73	15.8	11.6	1.03	0.00
63.98	24.1	0.77	3.21	63.8	5	114.6	3.55	1.86	1.69	0.73	11.5	8.4	1.64	0.00
64.14	18.9	0.73	3.86	69.2	4	114.6	3.56	1.87	1.69	0.73	12.1	8.9	1.23	0.00
64.30	20.4	0.44	2.17	74.2	6	114.6	3.57	1.87	1.70	0.73	7.8	5.7	1.34	0.12
64.47	15.7	0.35	2.24	78.2	5	114.6	3.57	1.87	1.70	0.73	7.5	5.5	0.97	0.10
64.63	12.7	0.29	2.29	107.1	5	114.6	3.58	1.88	1.71	0.73	6.1	4.4	0.73	0.00
64.80	13.0	0.30	2.31	112.1	5	114.6	3.59	1.88	1.71	0.73	6.2	4.6	0.76	0.00
64.96	13.7	0.39	2.86	117.0	5	114.6	3.60	1.89	1.72	0.73	6.5	4.8	0.81	0.00
65.12	15.0	0.66	4.43	118.6	3	111.4	3.61	1.89	1.72	0.73	14.3	10.4	0.91	0.00
65.29	20.4	0.75	3.69	126.6	4	114.6	3.62	1.90	1.73	0.73	13.0	9.4	1.34	0.00
65.45	24.0	1.16	4.84	106.1	3	111.4	3.63	1.90	1.73	0.73	23.0	16.7	1.63	0.00
65.62	28.6	1.40	4.90	103.2	3	111.4	3.64	1.90	1.74	0.72	27.4	19.9	2.00	0.00
65.78	66.6	1.82	2.74	62.1	6	114.6	3.65	1.91	1.74	0.72	25.5	18.5	5.03	0.00
65.94	87.4	2.37	2.71	34.4	6	114.6	3.66	1.91	1.75	0.72	33.5	24.2	6.70	0.00
66.11	102.0	2.74	2.68	24.4	6	114.6	3.67	1.92	1.75	0.72	39.1	28.2	7.87	0.00
66.27	112.1	3.30	2.94	15.0	6	114.6	3.68	1.92	1.76	0.72	42.9	31.0	8.67	0.00
66.44	134.2	3.62	2.70	10.5	7	117.8	3.69	1.92	1.76	0.72	42.9	30.9	UnDef	0.00
66.60	151.9	3.98	2.62	6.9	7	117.8	3.70	1.93	1.77	0.72	48.5	34.9	UnDef	0.00
66.76	150.7	4.28	2.84	5.7	7	117.8	3.71	1.93	1.77	0.72	48.1	34.6	UnDef	0.00
66.93	149.1	4.54	3.05	21.6	6	114.6	3.72	1.94	1.78	0.72	57.1	41.0	11.63	0.00
67.09	146.7	4.65	3.17	26.3	6	114.6	3.72	1.94	1.78	0.72	56.2	40.3	11.44	0.00
67.26	154.0	4.65	3.02	30.4	6	114.6	3.73	1.95	1.79	0.72	59.0	42.3	12.02	0.00

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
67.42	154.3	4.59	2.98	31.4	7	117.8	3.74	1.95	1.79	0.72	49.3	35.3	UnDef	0.00
67.58	157.2	4.32	2.75	26.7	7	117.8	3.75	1.96	1.80	0.72	50.2	35.9	UnDef	0.00
67.75	152.5	4.45	2.92	27.3	7	117.8	3.76	1.96	1.80	0.71	48.7	34.8	UnDef	0.00
67.91	132.9	4.14	3.12	30.3	6	114.6	3.77	1.96	1.81	0.71	50.9	36.3	10.33	0.00
68.08	120.7	3.83	3.17	30.2	6	114.6	3.78	1.97	1.81	0.71	46.2	33.0	9.35	0.00
68.24	109.4	3.61	3.30	22.1	6	114.6	3.79	1.97	1.82	0.71	41.9	29.8	8.45	0.00
68.40	93.8	3.42	3.64	23.4	6	114.6	3.80	1.98	1.82	0.71	35.9	25.6	7.20	0.00
68.57	81.8	3.23	3.95	29.5	5	114.6	3.81	1.98	1.83	0.71	39.2	27.8	6.24	0.00
68.73	80.0	3.06	3.82	28.3	5	114.6	3.82	1.99	1.83	0.71	38.3	27.2	6.10	0.00
68.90	78.0	3.06	3.92	19.0	5	114.6	3.83	1.99	1.84	0.71	37.4	26.5	5.94	0.00
69.06	76.7	3.02	3.93	11.9	5	114.6	3.84	1.99	1.84	0.71	36.7	26.0	5.83	0.00
69.22	67.5	2.97	4.39	4.7	5	114.6	3.85	2.00	1.85	0.71	32.3	22.9	5.09	0.00
69.39	59.3	2.90	4.88	2.8	11	130.5	3.86	2.00	1.85	0.71	16.2	11.5	UnDef	0.00
69.55	52.5	2.77	5.27	1.5	11	130.5	3.87	2.01	1.86	0.71	14.4	10.1	UnDef	0.00
69.72	46.5	2.54	5.46	-2.3	3	111.4	3.88	2.01	1.86	0.70	44.5	31.4	3.41	0.00
69.88	41.9	2.19	5.22	-7.7	3	111.4	3.89	2.02	1.87	0.70	40.1	28.2	3.04	0.00
70.05	41.3	2.11	5.09	-11.6	3	111.4	3.90	2.02	1.87	0.70	39.6	27.8	3.00	0.00
70.21	43.4	2.28	5.25	-14.5	3	111.4	3.91	2.03	1.88	0.70	41.5	29.2	3.16	0.00
70.37	45.1	2.48	5.49	-16.2	3	111.4	3.92	2.03	1.89	0.70	43.2	30.3	3.29	0.00
70.54	47.5	2.45	5.15	-17.6	3	111.4	3.92	2.03	1.89	0.70	45.5	31.9	3.49	0.00
70.70	49.9	1.36	2.73	-19.3	6	114.6	3.93	2.04	1.90	0.70	19.1	13.4	3.67	0.00
70.87	56.8	2.49	4.37	-21.0	5	114.6	3.94	2.04	1.90	0.70	27.2	19.0	4.23	0.00
71.03	33.8	2.78	8.21	-20.4	3	111.4	3.95	2.05	1.91	0.70	32.4	22.6	2.39	0.00
71.19	80.6	3.07	3.81	-20.8	5	114.6	3.96	2.05	1.91	0.70	38.6	27.0	6.13	0.00
71.36	103.7	3.37	3.25	-21.4	6	114.6	3.97	2.06	1.92	0.70	39.7	27.7	7.98	0.00
71.52	111.3	3.39	3.04	-21.6	6	114.6	3.98	2.06	1.92	0.70	42.6	29.7	8.59	0.00
71.69	100.5	3.18	3.16	-21.7	6	114.6	3.99	2.06	1.93	0.70	38.5	26.8	7.72	0.00
71.85	99.7	3.31	3.32	-21.7	6	114.6	4.00	2.07	1.93	0.70	38.2	26.6	7.66	0.00
72.01	101.9	3.62	3.55	-21.5	6	114.6	4.01	2.07	1.94	0.69	39.0	27.1	7.83	0.00
72.18	103.4	3.73	3.61	-21.3	6	114.6	4.02	2.08	1.94	0.69	39.6	27.5	7.95	0.00
72.34	115.4	3.98	3.45	-21.3	6	114.6	4.03	2.08	1.95	0.69	44.2	30.7	8.91	0.00
72.51	125.9	4.19	3.33	-20.9	6	114.6	4.04	2.09	1.95	0.69	48.2	33.4	9.75	0.00
72.67	125.0	4.17	3.34	-20.9	6	114.6	4.05	2.09	1.96	0.69	47.9	33.1	9.68	0.00
72.83	117.5	4.16	3.54	-21.0	6	114.6	4.06	2.09	1.96	0.69	45.0	31.1	9.08	0.00
73.00	106.7	4.12	3.86	-20.9	5	114.6	4.06	2.10	1.97	0.69	51.1	35.3	8.21	0.00
73.16	94.5	3.83	4.05	-21.0	5	114.6	4.07	2.10	1.97	0.69	45.3	31.2	7.24	0.00
73.33	84.3	3.47	4.12	-21.1	5	114.6	4.08	2.11	1.98	0.69	40.3	27.8	6.41	0.00
73.49	73.1	3.08	4.21	-21.3	5	114.6	4.09	2.11	1.98	0.69	35.0	24.1	5.52	0.00
73.65	65.8	2.93	4.45	-21.6	5	114.6	4.10	2.11	1.99	0.69	31.5	21.7	4.93	0.00
73.82	63.1	2.76	4.37	-21.9	5	114.6	4.11	2.12	1.99	0.69	30.2	20.7	4.72	0.00
73.98	63.7	2.68	4.20	-22.0	5	114.6	4.12	2.12	2.00	0.69	30.5	20.9	4.77	0.00
74.15	60.8	2.43	3.99	-22.7	5	114.6	4.13	2.13	2.00	0.69	29.1	19.9	4.53	0.00
74.31	51.8	2.74	5.28	-23.4	3	111.4	4.14	2.13	2.01	0.68	49.6	34.0	3.81	0.00
74.47	45.6	2.58	5.64	-21.0	3	111.4	4.15	2.14	2.01	0.68	43.7	29.9	3.32	0.00
74.64	33.1	2.14	6.45	-20.8	3	111.4	4.16	2.14	2.02	0.68	31.7	21.7	2.31	0.00
74.80	33.2	1.81	5.47	-20.4	3	111.4	4.17	2.14	2.02	0.68	31.8	21.7	2.32	0.00
74.97	24.7	1.45	5.89	-20.3	3	111.4	4.18	2.15	2.03	0.68	23.6	16.1	1.64	0.00
75.13	16.6	1.08	6.52	-20.3	3	111.4	4.19	2.15	2.03	0.68	15.9	10.8	0.99	0.00
75.29	14.9	0.70	4.71	-20.0	3	111.4	4.19	2.16	2.04	0.68	14.3	9.7	0.86	0.00
75.46	12.4	0.72	5.83	-19.9	3	111.4	4.20	2.16	2.04	0.68	11.9	8.1	0.65	0.00
75.62	12.9	0.85	6.61	-19.6	3	111.4	4.21	2.16	2.05	0.68	12.4	8.4	0.69	0.00
75.79	24.7	1.25	5.06	-18.9	3	111.4	4.22	2.17	2.05	0.68	23.7	16.1	1.64	0.00
75.95	47.5	1.77	3.74	-19.1	5	114.6	4.23	2.17	2.06	0.68	22.7	15.4	3.46	0.00
76.11	97.2	2.35	2.41	-18.5	7	117.8	4.24	2.18	2.06	0.68	31.0	21.0	UnDef	0.00

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
76.28	91.4	2.93	3.20	-18.4	6	114.6	4.25	2.18	2.07	0.68	35.0	23.7	6.97	0.00
76.44	109.6	2.70	2.46	-17.8	7	117.8	4.26	2.19	2.07	0.68	35.0	23.7	UnDef	0.00
76.61	118.0	2.52	2.13	0.3	7	117.8	4.27	2.19	2.08	0.68	37.7	25.4	UnDef	0.00
76.77	126.8	2.43	1.91	20.5	7	117.8	4.28	2.19	2.08	0.68	40.5	27.3	UnDef	0.43
76.93	142.5	2.60	1.82	45.9	7	117.8	4.29	2.20	2.09	0.67	45.5	30.7	UnDef	0.46
77.10	143.6	2.99	2.08	48.6	7	117.8	4.30	2.20	2.10	0.67	45.8	30.9	UnDef	0.00
77.26	143.2	3.14	2.19	50.9	7	117.8	4.31	2.21	2.10	0.67	45.7	30.8	UnDef	0.00
77.43	151.8	3.42	2.25	51.4	7	117.8	4.32	2.21	2.11	0.67	48.5	32.6	UnDef	0.00
77.59	159.1	3.81	2.39	50.5	7	117.8	4.33	2.22	2.11	0.67	50.8	34.1	UnDef	0.00
77.75	158.0	3.89	2.46	48.8	7	117.8	4.34	2.22	2.12	0.67	50.4	33.8	UnDef	0.00
77.92	149.5	3.96	2.65	46.9	7	117.8	4.35	2.23	2.12	0.67	47.7	32.0	UnDef	0.00
78.08	132.1	4.04	3.06	47.1	6	114.6	4.36	2.23	2.13	0.67	50.6	33.9	10.22	0.00
78.25	142.3	3.86	2.71	46.8	7	117.8	4.37	2.24	2.13	0.67	45.4	30.4	UnDef	0.00
78.41	137.5	3.63	2.64	45.4	7	117.8	4.38	2.24	2.14	0.67	43.9	29.3	UnDef	0.00
78.58	128.1	3.53	2.75	44.8	7	117.8	4.39	2.24	2.14	0.67	40.9	27.3	UnDef	0.00
78.74	117.8	3.41	2.89	44.1	6	114.6	4.39	2.25	2.15	0.67	45.1	30.1	9.07	0.00
78.90	115.2	3.50	3.04	39.8	6	114.6	4.40	2.25	2.15	0.67	44.1	29.4	8.86	0.00
79.07	107.2	3.64	3.40	38.4	6	114.6	4.41	2.26	2.16	0.67	41.0	27.3	8.22	0.00
79.23	99.5	3.72	3.74	35.0	6	114.6	4.42	2.26	2.16	0.67	38.1	25.4	7.61	0.00
79.40	91.0	3.79	4.17	33.8	5	114.6	4.43	2.27	2.17	0.66	43.6	28.9	6.92	0.00
79.56	71.1	3.37	4.73	31.5	11	130.5	4.44	2.27	2.17	0.66	19.5	12.9	UnDef	0.00
79.72	68.0	2.68	3.93	20.5	5	114.6	4.45	2.28	2.18	0.66	32.6	21.6	5.09	0.00
79.89	70.5	2.68	3.80	13.6	5	114.6	4.46	2.28	2.18	0.66	33.8	22.4	5.28	0.00
80.05	53.7	2.67	4.97	6.1	11	130.5	4.47	2.28	2.19	0.66	14.7	9.7	UnDef	0.00
80.22	47.5	2.15	4.51	4.6	4	114.6	4.48	2.29	2.19	0.66	30.4	20.1	3.45	0.00
80.38	67.9	2.26	3.32	2.9	6	114.6	4.49	2.29	2.20	0.66	26.0	17.2	5.08	0.00
80.54	46.0	1.99	4.33	0.7	4	114.6	4.50	2.30	2.20	0.66	29.4	19.4	3.32	0.00
80.71	37.5	1.63	4.35	0.9	4	114.6	4.51	2.30	2.21	0.66	24.0	15.8	2.64	0.00
80.87	32.9	1.15	3.51	1.4	5	114.6	4.52	2.31	2.21	0.66	15.7	10.4	2.27	0.00
81.04	24.5	0.89	3.64	1.4	5	114.6	4.53	2.31	2.22	0.66	11.7	7.7	1.60	0.00
81.20	15.3	0.81	5.30	1.5	3	111.4	4.54	2.32	2.22	0.66	14.7	9.7	0.86	0.00
81.36	16.4	0.70	4.29	2.3	3	111.4	4.55	2.32	2.23	0.66	15.7	10.3	0.95	0.00
81.53	16.9	0.63	3.73	5.7	4	114.6	4.56	2.32	2.23	0.66	10.8	7.1	0.99	0.00
81.69	12.6	0.48	3.81	6.1	3	111.4	4.57	2.33	2.24	0.66	12.1	7.9	0.65	0.00
81.86	12.7	0.42	3.32	6.6	4	114.6	4.58	2.33	2.24	0.65	8.1	5.3	0.65	0.00
82.02	11.5	0.40	3.50	7.0	3	111.4	4.58	2.34	2.25	0.65	11.0	7.2	0.55	0.00
82.18	11.0	0.38	3.46	7.3	3	111.4	4.59	2.34	2.25	0.65	10.6	6.9	0.51	0.00
82.35	11.3	0.37	3.28	7.5	4	114.6	4.60	2.34	2.26	0.65	7.2	4.7	0.54	0.00
82.51	11.2	0.35	3.12	7.9	4	114.6	4.61	2.35	2.26	0.65	7.2	4.7	0.53	0.00
82.68	11.3	0.34	3.02	8.3	4	114.6	4.62	2.35	2.27	0.65	7.2	4.7	0.53	0.00
82.84	11.3	0.33	2.92	8.6	4	114.6	4.63	2.36	2.27	0.65	7.2	4.7	0.54	0.00
83.00	11.6	0.31	2.68	9.1	5	114.6	4.64	2.36	2.28	0.65	5.5	3.6	0.56	0.00
83.17	11.2	0.29	2.59	9.6	5	114.6	4.65	2.37	2.28	0.65	5.4	3.5	0.53	0.00
83.33	11.2	0.29	2.59	9.9	5	114.6	4.66	2.37	2.29	0.65	5.4	3.5	0.53	0.00
83.50	11.0	0.28	2.54	10.4	5	114.6	4.67	2.37	2.29	0.65	5.3	3.4	0.51	0.00
83.66	11.0	0.28	2.54	10.7	5	114.6	4.68	2.38	2.30	0.65	5.3	3.4	0.51	0.00
83.82	11.2	0.30	2.69	11.3	5	114.6	4.69	2.38	2.31	0.65	5.3	3.5	0.52	0.00
83.99	11.5	0.31	2.70	11.5	5	114.6	4.70	2.39	2.31	0.65	5.5	3.6	0.55	0.00
84.15	11.2	0.31	2.78	11.9	5	114.6	4.71	2.39	2.32	0.65	5.3	3.5	0.52	0.00
84.32	11.0	0.29	2.63	12.2	5	114.6	4.72	2.40	2.32	0.65	5.3	3.4	0.51	0.00
84.48	11.0	0.27	2.47	12.7	5	114.6	4.73	2.40	2.33	0.65	5.3	3.4	0.50	0.00
84.64	10.8	0.25	2.31	13.1	5	114.6	4.73	2.40	2.33	0.65	5.2	3.3	0.49	0.00
84.81	11.0	0.26	2.37	15.0	5	114.6	4.74	2.41	2.34	0.64	5.3	3.4	0.50	0.00
84.97	10.7	0.27	2.53	15.2	5	114.6	4.75	2.41	2.34	0.64	5.1	3.3	0.47	0.00

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
85.14	11.1	0.28	2.53	15.5	5	114.6	4.76	2.42	2.35	0.64	5.3	3.4	0.51	0.00
85.30	10.8	0.27	2.49	15.8	5	114.6	4.77	2.42	2.35	0.64	5.2	3.3	0.49	0.00
85.46	10.8	0.27	2.51	16.4	5	114.6	4.78	2.43	2.36	0.64	5.2	3.3	0.48	0.00
85.63	10.9	0.29	2.67	16.5	5	114.6	4.79	2.43	2.36	0.64	5.2	3.3	0.49	0.00
85.79	10.9	0.29	2.67	17.0	5	114.6	4.80	2.43	2.37	0.64	5.2	3.3	0.49	0.00
85.96	10.8	0.27	2.51	17.2	5	114.6	4.81	2.44	2.37	0.64	5.2	3.3	0.48	0.00
86.12	10.8	0.27	2.50	17.3	5	114.6	4.82	2.44	2.38	0.64	5.2	3.3	0.48	0.00
86.29	10.9	0.27	2.48	17.5	5	114.6	4.83	2.45	2.38	0.64	5.2	3.3	0.49	0.00
86.45	11.0	0.26	2.36	17.8	5	114.6	4.84	2.45	2.39	0.64	5.3	3.4	0.50	0.00
86.61	10.7	0.27	2.52	18.1	5	114.6	4.85	2.46	2.39	0.64	5.1	3.3	0.47	0.00
86.78	10.7	0.25	2.34	18.4	5	114.6	4.86	2.46	2.40	0.64	5.1	3.3	0.47	0.00
86.94	10.8	0.25	2.33	18.5	5	114.6	4.87	2.46	2.40	0.64	5.2	3.3	0.47	0.00
87.11	10.8	0.25	2.32	18.8	5	114.6	4.88	2.47	2.41	0.64	5.2	3.3	0.48	0.00
87.27	10.9	0.27	2.47	18.8	5	114.6	4.88	2.47	2.41	0.64	5.2	3.3	0.48	0.00
87.43	10.8	0.27	2.51	19.2	5	114.6	4.89	2.48	2.42	0.64	5.2	3.3	0.47	0.00
87.60	10.7	0.27	2.54	19.4	5	114.6	4.90	2.48	2.42	0.63	5.1	3.2	0.46	0.00
87.76	10.6	0.27	2.55	19.7	5	114.6	4.91	2.49	2.43	0.63	5.1	3.2	0.46	0.00
87.93	10.5	0.26	2.48	20.1	5	114.6	4.92	2.49	2.43	0.63	5.0	3.2	0.45	0.00
88.09	10.4	0.24	2.31	21.6	5	114.6	4.93	2.49	2.44	0.63	5.0	3.2	0.44	0.00
88.25	10.4	0.24	2.30	21.7	5	114.6	4.94	2.50	2.44	0.63	5.0	3.2	0.44	0.00
88.42	10.3	0.25	2.43	21.7	5	114.6	4.95	2.50	2.45	0.63	4.9	3.1	0.43	0.00
88.58	10.8	0.27	2.50	22.3	5	114.6	4.96	2.51	2.45	0.63	5.2	3.3	0.47	0.00
88.75	11.3	0.28	2.49	22.4	5	114.6	4.97	2.51	2.46	0.63	5.4	3.4	0.50	0.00
88.91	11.0	0.27	2.47	22.7	5	114.6	4.98	2.51	2.46	0.63	5.2	3.3	0.48	0.00
89.07	10.7	0.27	2.53	23.0	5	114.6	4.99	2.52	2.47	0.63	5.1	3.2	0.46	0.00
89.24	10.9	0.26	2.39	23.2	5	114.6	5.00	2.52	2.47	0.63	5.2	3.3	0.47	0.00
89.40	11.1	0.25	2.26	23.5	5	114.6	5.01	2.53	2.48	0.63	5.3	3.3	0.49	0.00
89.57	11.1	0.24	2.18	23.9	5	114.6	5.02	2.53	2.48	0.63	5.3	3.3	0.48	0.00
89.73	11.2	0.23	2.05	24.0	5	114.6	5.03	2.54	2.49	0.63	5.4	3.4	0.50	0.00
89.89	11.0	0.24	2.18	24.2	5	114.6	5.04	2.54	2.49	0.63	5.3	3.3	0.48	0.00
90.06	10.9	0.26	2.39	24.6	5	114.6	5.04	2.54	2.50	0.63	5.2	3.3	0.47	0.00
90.22	10.7	0.26	2.44	24.7	5	114.6	5.05	2.55	2.50	0.63	5.1	3.2	0.45	0.00
90.39	10.1	0.30	2.97	24.9	4	114.6	5.06	2.55	2.51	0.63	6.5	4.0	0.40	0.00
90.55	10.0	0.27	2.71	25.4	4	114.6	5.07	2.56	2.52	0.63	6.4	4.0	0.39	0.00
90.71	12.3	0.34	2.76	25.5	5	114.6	5.08	2.56	2.52	0.62	5.9	3.7	0.58	0.00
90.88	13.2	0.49	3.72	25.8	3	111.4	5.09	2.57	2.53	0.62	12.6	7.9	0.65	0.00
91.04	13.7	0.76	5.57	26.2	3	111.4	5.10	2.57	2.53	0.62	13.1	8.2	0.69	0.00
91.21	14.8	0.83	5.63	26.5	3	111.4	5.11	2.57	2.54	0.62	14.1	8.8	0.77	0.00
91.37	24.4	1.06	4.35	29.2	3	111.4	5.12	2.58	2.54	0.62	23.4	14.6	1.54	0.00
91.53	28.5	1.14	4.00	29.4	4	114.6	5.13	2.58	2.55	0.62	18.2	11.3	1.87	0.00
91.70	21.3	1.04	4.90	30.1	3	111.4	5.14	2.59	2.55	0.62	20.4	12.7	1.29	0.00
91.86	20.8	1.06	5.10	29.9	3	111.4	5.15	2.59	2.56	0.62	20.0	12.4	1.26	0.00
92.03	21.4	1.12	5.24	29.9	3	111.4	5.16	2.59	2.56	0.62	20.5	12.7	1.30	0.00
92.19	22.2	1.19	5.38	30.0	3	111.4	5.16	2.60	2.57	0.62	21.2	13.2	1.36	0.00
92.35	22.0	1.18	5.38	30.0	3	111.4	5.17	2.60	2.57	0.62	21.1	13.1	1.34	0.00
92.52	22.6	1.11	4.93	30.2	3	111.4	5.18	2.61	2.58	0.62	21.6	13.4	1.39	0.00
92.68	22.2	1.09	4.91	30.6	3	111.4	5.19	2.61	2.58	0.62	21.3	13.2	1.36	0.00
92.85	21.8	1.09	5.02	30.5	3	111.4	5.20	2.61	2.59	0.62	20.9	12.9	1.33	0.00
93.01	22.5	1.14	5.07	30.7	3	111.4	5.21	2.62	2.59	0.62	21.6	13.3	1.39	0.00
93.17	24.7	1.20	4.88	30.8	3	111.4	5.22	2.62	2.60	0.62	23.6	14.6	1.56	0.00
93.34	25.6	1.33	5.20	31.1	3	111.4	5.23	2.63	2.60	0.62	24.5	15.1	1.63	0.00
93.50	25.4	1.37	5.40	31.0	3	111.4	5.24	2.63	2.61	0.62	24.4	15.0	1.62	0.00
93.67	26.6	1.33	5.02	31.3	3	111.4	5.25	2.63	2.61	0.62	25.4	15.7	1.70	0.00
93.83	27.8	1.58	5.70	31.4	3	111.4	5.26	2.64	2.62	0.62	26.6	16.4	1.80	0.00

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60	(N1)60 (blows/ft)	Su (tsf)	CRR
93.99	28.3	1.85	6.55	31.4	3	111.4	5.27	2.64	2.62	0.62	27.1	16.7	1.84	0.00
94.16	28.8	1.97	6.85	29.1	3	111.4	5.27	2.65	2.63	0.61	27.6	17.0	1.88	0.00
94.32	29.7	1.62	5.47	28.0	3	111.4	5.28	2.65	2.63	0.61	28.4	17.5	1.95	0.00
94.49	29.2	1.55	5.32	28.1	3	111.4	5.29	2.65	2.64	0.61	28.0	17.2	1.91	0.00
94.65	26.8	1.38	5.15	28.7	3	111.4	5.30	2.66	2.64	0.61	25.7	15.8	1.72	0.00
94.82	26.3	1.25	4.77	28.9	3	111.4	5.31	2.66	2.65	0.61	25.2	15.4	1.68	0.00
94.98	25.0	1.28	5.13	29.2	3	111.4	5.32	2.67	2.65	0.61	23.9	14.7	1.57	0.00
95.14	26.3	1.31	5.00	29.1	3	111.4	5.33	2.67	2.66	0.61	25.2	15.4	1.68	0.00
95.31	27.7	1.37	4.95	29.6	3	111.4	5.34	2.67	2.66	0.61	26.6	16.2	1.79	0.00
95.47	29.0	1.30	4.50	29.9	3	111.4	5.35	2.68	2.67	0.61	27.7	17.0	1.89	0.00
95.64	29.0	1.38	4.77	30.2	3	111.4	5.36	2.68	2.67	0.61	27.8	17.0	1.89	0.00
95.80	30.9	1.58	5.12	30.4	3	111.4	5.37	2.69	2.68	0.61	29.6	18.1	2.05	0.00
95.96	31.8	1.62	5.10	30.8	3	111.4	5.37	2.69	2.68	0.61	30.5	18.6	2.12	0.00
96.13	34.4	1.56	4.55	31.1	4	114.6	5.38	2.70	2.69	0.61	22.0	13.4	2.32	0.00
96.29	34.4	1.45	4.23	31.4	4	114.6	5.39	2.70	2.69	0.61	22.0	13.4	2.32	0.00
96.46	30.8	1.51	4.91	31.7	3	111.4	5.40	2.70	2.70	0.61	29.5	17.9	2.03	0.00
96.62	31.7	1.60	5.06	31.7	3	111.4	5.41	2.71	2.70	0.61	30.4	18.5	2.10	0.00
96.78	37.8	1.76	4.67	32.4	4	114.6	5.42	2.71	2.71	0.61	24.1	14.6	2.59	0.00
96.95	38.4	1.72	4.50	32.1	4	114.6	5.43	2.72	2.71	0.61	24.5	14.9	2.63	0.00
97.11	35.9	1.70	4.75	33.0	3	111.4	5.44	2.72	2.72	0.61	34.4	20.8	2.44	0.00
97.28	38.0	2.05	5.41	33.0	3	111.4	5.45	2.72	2.72	0.61	36.4	22.0	2.60	0.00
97.44	46.8	2.18	4.65	33.6	4	114.6	5.46	2.73	2.73	0.61	29.8	18.1	3.30	0.00
97.60	41.1	2.00	4.87	33.7	3	111.4	5.47	2.73	2.74	0.61	39.4	23.8	2.85	0.00
97.77	40.8	1.73	4.25	34.5	4	114.6	5.48	2.74	2.74	0.60	26.1	15.8	2.83	0.00
97.93	37.0	1.65	4.47	35.9	4	114.6	5.49	2.74	2.75	0.60	23.6	14.3	2.52	0.00
98.10	36.2	1.53	4.24	36.4	4	114.6	5.50	2.75	2.75	0.60	23.1	14.0	2.46	0.00
98.26	35.0	1.50	4.29	36.9	4	114.6	5.51	2.75	2.76	0.60	22.4	13.5	2.36	0.00
98.42	37.5	1.57	4.19	37.4	4	114.6	5.51	2.75	2.76	0.60	24.0	14.4	2.56	0.00
98.59	37.9	1.86	4.92	38.0	3	111.4	5.52	2.76	2.77	0.60	36.3	21.9	2.59	0.00
98.75	42.4	1.95	4.61	38.1	4	114.6	5.53	2.76	2.77	0.60	27.1	16.3	2.95	0.00
98.92	42.1	1.76	4.19	38.4	5	114.6	5.54	2.77	2.78	0.60	20.2	12.1	2.93	0.00
99.08	38.2	1.49	3.91	38.6	5	114.6	5.55	2.77	2.78	0.60	18.3	11.0	2.61	0.00
99.24	35.4	1.25	3.53	38.7	5	114.6	5.56	2.77	2.79	0.60	17.0	10.2	2.39	0.00
99.41	33.9	1.37	4.05	39.1	4	114.6	5.57	2.78	2.79	0.60	21.6	13.0	2.26	0.00
99.57	38.1	1.53	4.02	39.9	5	114.6	5.58	2.78	2.80	0.60	18.3	10.9	2.60	0.00
99.74	39.7	1.75	4.42	40.5	4	114.6	5.59	2.79	2.80	0.60	25.3	15.2	2.73	0.00
99.90	45.1	1.92	4.27	40.6	5	114.6	5.60	2.79	2.81	0.60	21.6	12.9	3.16	0.00
100.06	44.6	1.91	4.30	40.5	4	114.6	5.61	2.80	2.81	0.60	28.5	17.0	3.12	0.00
100.23	39.8	1.67	4.20	41.3	4	114.6	5.62	2.80	2.82	0.60	25.4	15.2	2.74	0.00
100.39	39.0	1.59	4.08	41.8	5	114.6	5.63	2.80	2.82	0.60	18.7	11.2	2.67	0.00
100.56	38.7	1.71	4.43	42.2	4	114.6	5.64	2.81	2.83	0.60	24.7	14.7	2.64	0.00
100.72	43.9	1.81	4.13	42.7	5	114.6	5.65	2.81	2.83	0.60	21.0	12.5	3.06	0.00
100.88	43.0	2.07	4.80	43.5	4	114.6	5.66	2.82	2.84	0.60	27.5	16.4	2.99	0.00
101.05	47.9	2.17	4.52	43.8	4	114.6	5.66	2.82	2.84	0.60	30.6	18.2	3.38	0.00
101.21	43.8	2.10	4.79	43.9	4	114.6	5.67	2.83	2.85	0.59	27.9	16.6	3.05	0.00
101.38	44.2	1.93	4.38	46.3	4	114.6	5.68	2.83	2.85	0.59	28.2	16.8	3.08	0.00
101.54	41.5	1.85	4.47	46.8	4	114.6	5.69	2.83	2.86	0.59	26.5	15.7	2.87	0.00
101.70	40.6	1.72	4.25	47.3	4	114.6	5.70	2.84	2.86	0.59	25.9	15.4	2.79	0.00
101.87	36.7	1.53	4.18	47.7	4	114.6	5.71	2.84	2.87	0.59	23.4	13.9	2.48	0.00
102.03	34.4	1.45	4.22	47.8	4	114.6	5.72	2.85	2.87	0.59	22.0	13.0	2.30	0.00
102.20	34.0	1.64	4.84	48.0	3	111.4	5.73	2.85	2.88	0.59	32.5	19.3	2.26	0.00
102.36	40.0	1.65	4.14	48.5	5	114.6	5.74	2.86	2.88	0.59	19.1	11.3	2.74	0.00
102.53	39.9	1.83	4.59	49.0	4	114.6	5.75	2.86	2.89	0.59	25.5	15.1	2.73	0.00
102.69	40.9	1.87	4.59	49.2	4	114.6	5.76	2.86	2.89	0.59	26.1	15.4	2.81	0.00

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (tsf)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
102.85	42.9	1.81	4.23	50.1	5	114.6	5.77	2.87	2.90	0.59	20.5	12.1	2.97	0.00
103.02	41.5	1.93	4.66	50.1	4	114.6	5.78	2.87	2.90	0.59	26.5	15.7	2.86	0.00
103.18	36.9	1.93	5.24	50.1	3	111.4	5.79	2.88	2.91	0.59	35.4	20.9	2.49	0.00
103.35	36.6	1.93	5.29	50.2	3	111.4	5.80	2.88	2.91	0.59	35.1	20.7	2.46	0.00
103.51	36.9	2.04	5.54	50.9	3	111.4	5.80	2.88	2.92	0.59	35.3	20.8	2.49	0.00
103.67	37.5	1.96	5.24	51.5	3	111.4	5.81	2.89	2.92	0.59	35.9	21.1	2.53	0.00
103.84	39.4	1.70	4.33	51.9	4	114.6	5.82	2.89	2.93	0.59	25.1	14.8	2.68	0.00
104.00	35.9	1.60	4.46	52.5	4	114.6	5.83	2.90	2.93	0.59	22.9	13.5	2.41	0.00
104.17	33.8	1.53	4.54	52.5	4	114.6	5.84	2.90	2.94	0.59	21.6	12.7	2.24	0.00
104.33	35.6	1.24	3.49	53.1	5	114.6	5.85	2.91	2.95	0.59	17.1	10.0	2.38	0.00
104.49	34.0	1.25	3.69	53.6	5	114.6	5.86	2.91	2.95	0.59	16.3	9.5	2.25	0.00
104.66	35.1	1.14	3.26	55.7	5	114.6	5.87	2.91	2.96	0.59	16.8	9.8	2.34	0.00
104.82	34.9	1.27	3.65	56.9	5	114.6	5.88	2.92	2.96	0.59	16.7	9.8	2.32	0.00
104.99	38.9	1.86	4.79	58.1	3	111.4	5.89	2.92	2.97	0.58	37.2	21.8	2.64	0.00
105.15	45.8	2.26	4.92	59.0	3	111.4	5.90	2.93	2.97	0.58	43.9	25.6	3.19	0.00
105.31	43.4	2.16	4.96	58.6	3	111.4	5.91	2.93	2.98	0.58	41.6	24.3	3.00	0.00
105.48	41.2	1.77	4.30	59.5	4	114.6	5.92	2.94	2.98	0.58	26.3	15.4	2.83	0.00
105.64	39.4	1.57	3.99	59.5	5	114.6	5.93	2.94	2.99	0.58	18.9	11.0	2.68	0.00
105.81	33.4	1.55	4.66	60.0	3	111.4	5.93	2.94	2.99	0.58	32.0	18.6	2.19	0.00
105.97	34.2	1.49	4.36	60.6	4	114.6	5.94	2.95	3.00	0.58	21.9	12.7	2.26	0.00
106.13	31.0	1.50	4.85	60.7	3	111.4	5.95	2.95	3.00	0.58	29.7	17.3	2.01	0.00
106.30	33.9	1.56	4.61	61.5	3	111.4	5.96	2.96	3.01	0.58	32.5	18.9	2.24	0.00
106.46	34.0	1.70	5.01	61.8	3	111.4	5.97	2.96	3.01	0.58	32.6	18.9	2.24	0.00
106.63	38.0	1.77	4.67	62.1	4	114.6	5.98	2.96	3.02	0.58	24.3	14.1	2.56	0.00
106.79	36.9	1.61	4.38	62.0	4	114.6	5.99	2.97	3.02	0.58	23.5	13.7	2.47	0.00
106.95	33.9	1.50	4.44	62.8	4	114.6	6.00	2.97	3.03	0.58	21.6	12.5	2.23	0.00
107.12	32.7	1.51	4.62	63.7	3	111.4	6.01	2.98	3.03	0.58	31.4	18.2	2.14	0.00
107.28	31.2	1.58	5.08	64.2	3	111.4	6.02	2.98	3.04	0.58	29.9	17.3	2.01	0.00
107.45	34.0	1.69	4.98	64.8	3	111.4	6.03	2.98	3.04	0.58	32.6	18.9	2.24	0.00
107.61	36.0	1.73	4.81	65.5	3	111.4	6.04	2.99	3.05	0.58	34.5	20.0	2.40	0.00
107.77	39.4	1.71	4.35	68.1	4	114.6	6.05	2.99	3.05	0.58	25.1	14.5	2.67	0.00
107.94	38.5	1.58	4.12	68.4	5	114.6	6.06	3.00	3.06	0.58	18.4	10.6	2.59	0.00
108.10	33.4	1.56	4.68	68.6	3	111.4	6.06	3.00	3.06	0.58	32.0	18.5	2.19	0.00
108.27	33.9	1.47	4.34	69.4	4	114.6	6.07	3.01	3.07	0.58	21.7	12.5	2.23	0.00
108.43	29.5	1.43	4.86	69.7	3	111.4	6.08	3.01	3.07	0.58	28.2	16.3	1.87	0.00
108.59	33.0	1.23	3.73	70.5	5	114.6	6.09	3.01	3.08	0.58	15.8	9.1	2.16	0.00
108.76	29.7	1.25	4.22	70.4	4	114.6	6.10	3.02	3.08	0.58	19.0	10.9	1.89	0.00
108.92	31.2	1.37	4.40	70.3	4	114.6	6.11	3.02	3.09	0.58	19.9	11.5	2.01	0.00
109.09	37.7	1.51	4.01	71.5	5	114.6	6.12	3.03	3.09	0.57	18.1	10.4	2.53	0.00
109.25	34.2	1.56	4.57	71.5	4	114.6	6.13	3.03	3.10	0.57	21.9	12.6	2.25	0.00
109.41	30.6	1.37	4.48	72.0	3	111.4	6.14	3.03	3.10	0.57	29.3	16.8	1.96	0.00
109.58	29.3	1.25	4.28	72.6	4	114.6	6.15	3.04	3.11	0.57	18.7	10.7	1.85	0.00
109.74	28.4	1.22	4.30	72.6	4	114.6	6.16	3.04	3.11	0.57	18.1	10.4	1.78	0.00
109.91	31.6	1.38	4.37	73.4	4	114.6	6.17	3.05	3.12	0.57	20.2	11.6	2.04	0.00
110.07	32.8	1.48	4.53	73.2	4	114.6	6.18	3.05	3.12	0.57	20.9	12.0	2.13	0.00
110.23	32.3	1.58	4.90	73.2	3	111.4	6.19	3.06	3.13	0.57	31.0	17.7	2.09	0.00
110.40	35.1	1.24	3.55	74.6	5	114.6	6.19	3.06	3.13	0.57	16.8	9.6	2.31	0.00
110.56	36.8	1.30	3.54	76.0	5	114.6	6.20	3.06	3.14	0.57	17.6	10.1	2.45	0.00
110.73	45.8	1.30	2.85	95.7	6	114.6	6.21	3.07	3.14	0.57	17.5	10.0	3.16	0.27

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.17
Run No: 98-0720-1458-3332
Job No: 98-124
Client: NINYO & MOORE
Project: DEL MAR CA.
Site: GE
Location: CPT-2
Cone: ERIK OLSEN
CPT Date: 98/15/07
CPT Time: 10:58
CPT File: 124C02.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.05 (ft): 10.0
Su Nkt used: 12.50
Averaging Increment (m): 0.0 (Every Data Point)
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
0.16	5.0E-06	0.00	900.8	1.18	9	16.2	0.0	16.2	1.4	UnDef	UnDef	10.0	UnDef	0.0	8.
0.33	5.0E-04	0.00	1000.0	0.46	10	42.0	0.0	42.0	0.0	50	80.0	1.0	-0.32	0.0	14.
0.49	5.0E-04	0.00	1000.0	0.76	10	81.3	0.0	81.3	0.0	50	93.1	1.0	-0.37	0.0	27.
0.66	5.0E-04	0.00	1000.0	1.07	9	82.5	0.0	82.5	0.8	50	89.3	1.0	-0.41	0.0	27.
0.82	5.0E-04	0.00	694.2	1.33	9	63.8	0.0	63.8	2.6	50	78.7	1.0	-0.41	0.0	21.
0.98	5.0E-05	0.00	484.8	1.26	9	53.4	0.0	53.4	3.4	48	71.0	10.0	-0.36	0.0	21.
1.15	5.0E-05	0.00	452.8	1.72	9	58.1	0.8	58.9	5.5	48	71.2	10.0	-0.40	0.2	23.
1.31	5.0E-04	0.00	924.8	1.60	12	135.4	UnDef	UnDef	0.0	50	93.6	1.0	-0.46	UnDef	UnDe
1.48	5.0E-04	0.00	1000.0	2.26	12	178.1	UnDef	UnDef	0.0	50	95.0	1.0	-0.54	UnDef	UnDe
1.64	5.0E-04	0.00	1000.0	2.42	12	189.2	UnDef	UnDef	0.0	50	95.0	1.0	-0.56	UnDef	UnDe
1.80	5.0E-05	0.00	926.0	2.62	12	186.8	UnDef	UnDef	0.0	50	95.0	10.0	-0.57	UnDef	UnDe
1.97	5.0E-04	0.00	856.1	2.55	12	188.3	UnDef	UnDef	0.0	50	95.0	1.0	-0.56	UnDef	UnDe
2.13	5.0E-05	0.00	721.3	2.71	12	171.9	UnDef	UnDef	0.0	50	93.4	10.0	-0.55	UnDef	UnDe
2.30	5.0E-05	0.00	648.5	2.86	12	166.3	UnDef	UnDef	0.0	50	91.4	10.0	-0.56	UnDef	UnDe
2.46	5.0E-05	0.00	582.6	2.96	12	159.9	UnDef	UnDef	0.0	50	89.4	10.0	-0.55	UnDef	UnDe
2.62	5.0E-05	0.00	508.4	2.88	12	148.7	UnDef	UnDef	0.0	48	86.4	10.0	-0.53	UnDef	UnDe
2.79	5.0E-05	0.00	432.7	2.78	12	134.5	UnDef	UnDef	0.0	48	82.6	10.0	-0.50	UnDef	UnDe
2.95	5.0E-05	0.00	416.6	2.60	12	137.0	UnDef	UnDef	0.0	48	82.3	10.0	-0.48	UnDef	UnDe
3.12	5.0E-05	0.00	406.5	2.59	12	141.0	UnDef	UnDef	0.0	48	82.4	10.0	-0.47	UnDef	UnDe
3.28	5.0E-05	0.00	354.7	2.71	12	129.5	UnDef	UnDef	0.0	48	79.2	10.0	-0.47	UnDef	UnDe
3.44	5.0E-05	0.00	313.4	2.69	12	120.1	UnDef	UnDef	0.0	46	76.4	10.0	-0.45	UnDef	UnDe
3.61	5.0E-05	0.00	274.3	2.71	12	110.1	UnDef	UnDef	0.0	46	73.2	10.0	-0.44	UnDef	UnDe
3.77	5.0E-05	0.00	240.4	2.69	12	100.9	UnDef	UnDef	0.0	46	70.1	10.0	-0.42	UnDef	UnDe
3.94	5.0E-05	-0.01	230.6	2.50	9	101.0	22.8	123.8	11.9	46	69.5	10.0	-0.40	5.3	45.
4.10	5.0E-05	0.00	239.6	2.31	9	109.2	20.7	129.9	11.0	46	71.2	10.0	-0.39	4.8	48.
4.27	5.0E-04	0.00	250.7	2.16	9	118.8	18.7	137.5	10.1	46	73.0	1.0	-0.38	3.7	43.
4.43	5.0E-04	0.00	254.2	2.16	9	125.2	19.3	144.5	10.0	46	74.0	1.0	-0.38	3.8	45.
4.59	5.0E-04	0.00	258.3	2.17	9	130.8	20.1	150.9	10.0	46	75.0	1.0	-0.38	3.9	46.
4.76	5.0E-04	0.00	268.4	2.11	9	138.4	19.0	157.4	9.5	46	76.6	1.0	-0.38	3.7	48.
4.92	5.0E-04	0.00	272.9	2.11	9	143.1	19.2	162.3	9.4	46	77.6	1.0	-0.38	3.7	50.
5.09	5.0E-04	0.00	274.9	2.07	9	146.6	18.5	165.1	9.2	46	78.2	1.0	-0.38	3.6	51.
5.25	5.0E-04	0.00	273.5	1.72	9	148.2	12.0	160.3	7.8	46	78.6	1.0	-0.35	2.4	50.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
5.41	5.0E-04	0.00	260.6	1.75	9	143.5	13.4	156.9	8.2	46	77.6	1.0	-0.35	2.6	49.
5.58	5.0E-04	0.00	218.7	2.09	9	122.4	21.8	144.1	10.7	46	73.1	1.0	-0.36	4.2	44.
5.74	5.0E-04	0.00	216.2	2.10	9	122.8	22.3	145.0	10.8	46	73.2	1.0	-0.36	4.3	44.
5.91	5.0E-04	0.00	214.4	2.03	9	123.5	21.3	144.8	10.5	46	73.3	1.0	-0.35	4.1	44.
6.07	5.0E-04	0.00	200.9	2.09	9	117.4	23.3	140.7	11.2	46	71.9	1.0	-0.35	4.4	42.
6.23	5.0E-04	0.00	183.0	2.12	9	108.4	24.6	133.0	11.9	44	69.6	1.0	-0.34	4.6	40.
6.40	5.0E-04	-0.01	164.7	2.16	7	98.9	26.3	125.2	12.9	44	67.0	1.0	-0.33	4.9	37.
6.56	5.0E-04	-0.01	148.2	2.11	7	90.2	26.2	116.5	13.4	44	64.3	1.0	-0.32	4.8	34.
6.73	5.0E-05	-0.01	128.9	2.05	7	79.5	26.2	105.7	14.3	44	60.7	10.0	-0.30	5.7	36.
6.89	5.0E-05	-0.01	108.7	2.00	7	67.9	26.6	94.5	15.5	42	56.2	10.0	-0.27	5.7	32.
7.05	5.0E-05	-0.01	89.0	2.03	7	56.4	28.4	84.8	17.5	42	50.9	10.0	-0.25	5.8	27.
7.22	5.0E-05	-0.01	66.6	2.22	7	42.8	33.9	76.7	21.5	40	43.0	10.0	-0.24	6.4	23.
7.38	5.0E-05	-0.02	47.8	2.20	7	31.3	37.6	68.9	25.5	38	34.0	6.0	-0.20	6.4	18.
7.55	5.0E-06	-0.03	28.3	2.02	6	19.0	49.2	68.2	32.0	UnDef	UnDef	6.0	UnDef	7.6	16.
7.71	5.0E-08	-0.08	9.5	3.05	4	6.9	27.6	34.5	59.7	UnDef	UnDef	3.0	UnDef	6.8	13.
7.87	1.0E-07	-0.09	8.7	1.52	6	6.4	25.6	32.0	51.5	UnDef	UnDef	3.0	UnDef	3.1	6.
8.04	1.0E-07	-0.05	13.8	0.79	7	9.9	36.7	46.5	34.5	UnDef	UnDef	6.0	UnDef	4.7	9.
8.20	5.0E-06	-0.06	12.0	1.25	6	8.7	34.7	43.4	42.1	UnDef	UnDef	3.0	UnDef	4.3	8.
8.37	1.0E-07	-0.05	14.3	0.73	7	10.4	31.8	42.1	33.2	UnDef	UnDef	6.0	UnDef	4.5	9.
8.53	1.0E-07	-0.08	8.2	1.26	6	6.3	25.1	31.4	50.5	UnDef	UnDef	3.0	UnDef	3.1	6.
8.69	1.0E-07	-0.05	12.4	0.82	6	9.2	36.9	46.1	36.9	UnDef	UnDef	3.0	UnDef	4.5	9.
8.86	5.0E-05	-0.04	16.1	0.63	7	11.8	23.3	35.1	29.9	32	30.0	6.0	0.02	3.3	7.
9.02	5.0E-05	-0.03	18.2	0.54	7	13.4	18.5	31.9	26.7	32	30.0	6.0	0.02	3.0	8.
9.19	5.0E-05	-0.03	22.4	0.43	7	16.5	0.0	16.5	5.0	34	30.0	6.0	0.01	0.0	6.
9.35	5.0E-05	-0.03	19.5	0.49	7	14.6	0.0	14.6	5.0	32	30.0	6.0	0.02	0.0	5.
9.51	5.0E-05	-0.03	16.9	0.55	7	12.9	20.5	33.4	28.0	32	30.0	6.0	0.02	3.1	8.
9.68	5.0E-05	-0.03	17.9	0.82	7	13.6	28.4	42.0	30.3	32	30.0	6.0	-0.01	3.9	9.
9.84	5.0E-06	-0.03	15.2	0.83	7	11.8	36.4	48.2	33.3	UnDef	UnDef	6.0	UnDef	5.2	10.
10.01	1.0E-07	-0.05	9.4	0.38	7	7.7	30.7	38.4	36.3	UnDef	UnDef	3.0	UnDef	3.8	7.
10.17	1.0E-07	-0.10	4.8	1.85	4	4.3	17.1	21.3	70.0	UnDef	UnDef	1.5	UnDef	2.1	4.
10.33	5.0E-08	-0.20	2.4	3.61	1	2.6	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
10.50	5.0E-08	-0.20	2.4	3.63	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
10.66	5.0E-08	-0.25	2.4	3.58	1	2.6	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
10.83	5.0E-08	-0.30	2.3	3.73	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
10.99	5.0E-08	-0.27	2.3	3.74	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
11.15	5.0E-08	-0.22	2.3	3.73	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
11.32	5.0E-08	-0.18	2.3	3.73	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
11.48	5.0E-08	-0.17	2.2	3.75	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
11.65	5.0E-08	-0.16	2.2	3.77	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
11.81	5.0E-08	-0.15	2.2	3.79	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
11.97	5.0E-08	-0.09	2.2	3.78	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
12.14	5.0E-08	-0.09	2.2	3.80	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
12.30	5.0E-08	-0.09	2.1	3.82	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
12.47	5.0E-08	-0.09	2.1	3.85	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
12.63	5.0E-08	-0.08	2.1	3.87	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
12.80	5.0E-08	-0.09	2.1	3.78	1	2.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
12.96	5.0E-08	-0.08	2.2	3.58	1	2.6	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
13.12	1.0E-07	-0.05	3.4	2.36	4	3.5	14.0	17.6	85.1	UnDef	UnDef	1.5	UnDef	1.7	3.
13.29	1.0E-07	-0.06	2.9	2.76	1	3.1	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
13.45	1.0E-07	-0.06	2.6	2.98	1	3.0	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
13.62	1.0E-07	-0.07	2.4	3.24	1	2.8	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
13.78	1.0E-07	-0.08	2.5	3.08	1	2.9	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
13.94	1.0E-07	-0.12	3.2	2.42	4	3.5	13.9	17.3	86.8	UnDef	UnDef	1.5	UnDef	1.7	3.
14.11	1.0E-07	-0.11	3.6	2.16	4	3.8	15.1	18.9	81.2	UnDef	UnDef	1.5	UnDef	1.8	3.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
14.27	1.0E-07	-0.13	3.1	2.54	1	3.4	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
14.44	1.0E-07	-0.13	3.1	2.50	4	3.4	13.6	17.0	88.7	UnDef	UnDef	1.0	UnDef	1.7	3.
14.60	5.0E-08	-0.17	2.2	3.56	1	2.7	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
14.76	5.0E-08	-0.20	1.8	4.21	1	2.4	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
14.93	5.0E-08	-0.20	1.8	4.24	1	2.4	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
15.09	5.0E-08	-0.17	1.8	4.25	1	2.4	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
15.26	5.0E-08	-0.16	1.8	4.27	1	2.4	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
15.42	5.0E-08	-0.14	1.7	4.29	1	2.4	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
15.58	1.0E-07	-0.08	3.0	2.49	4	3.4	13.7	17.1	89.8	UnDef	UnDef	1.0	UnDef	1.7	3.
15.75	1.0E-07	-0.06	4.0	1.86	4	4.2	16.9	21.1	75.5	UnDef	UnDef	1.5	UnDef	2.1	4.
15.91	1.0E-07	-0.05	4.4	1.71	4	4.5	18.1	22.6	71.6	UnDef	UnDef	1.5	UnDef	2.2	4.
16.08	1.0E-07	-0.04	5.8	1.28	4	5.7	22.8	28.4	59.5	UnDef	UnDef	1.5	UnDef	2.8	5.
16.24	1.0E-07	-0.04	6.7	1.10	6	6.4	25.8	32.2	53.8	UnDef	UnDef	3.0	UnDef	3.2	6.
16.40	1.0E-07	-0.03	6.9	1.08	6	6.6	26.3	32.9	52.9	UnDef	UnDef	3.0	UnDef	3.2	6.
16.57	1.0E-07	-0.04	6.0	1.22	4	5.9	23.7	29.6	57.8	UnDef	UnDef	1.5	UnDef	2.9	5.
16.73	1.0E-07	-0.04	5.8	1.28	4	5.7	22.9	28.6	59.6	UnDef	UnDef	1.5	UnDef	2.8	5.
16.90	1.0E-07	-0.04	5.9	1.25	4	5.8	23.3	29.1	58.8	UnDef	UnDef	1.5	UnDef	2.8	5.
17.06	1.0E-07	-0.05	5.3	1.39	4	5.3	21.4	26.7	63.0	UnDef	UnDef	1.5	UnDef	2.6	5.
17.22	1.0E-07	-0.06	4.5	1.62	4	4.7	19.0	23.7	69.7	UnDef	UnDef	1.5	UnDef	2.3	4.
17.39	1.0E-07	-0.06	4.7	1.56	4	4.9	19.5	24.4	68.0	UnDef	UnDef	1.5	UnDef	2.4	4.
17.55	1.0E-07	-0.05	4.9	1.48	4	5.1	20.3	25.4	65.9	UnDef	UnDef	1.5	UnDef	2.5	5.
17.72	1.0E-07	-0.05	5.3	1.36	4	5.4	21.7	27.2	62.5	UnDef	UnDef	1.5	UnDef	2.7	5.
17.88	1.0E-07	-0.05	4.9	1.49	4	5.1	20.3	25.4	66.2	UnDef	UnDef	1.5	UnDef	2.5	5.
18.04	1.0E-07	-0.05	4.8	1.51	4	5.0	20.1	25.1	66.8	UnDef	UnDef	1.5	UnDef	2.5	4.
18.21	1.0E-07	-0.05	5.2	1.40	4	5.3	21.3	26.6	63.9	UnDef	UnDef	1.5	UnDef	2.6	5.
18.37	1.0E-07	-0.04	4.8	1.49	4	5.1	20.3	25.3	66.5	UnDef	UnDef	1.5	UnDef	2.5	5.
18.54	1.0E-07	-0.04	5.6	1.30	4	5.7	22.7	28.3	60.8	UnDef	UnDef	1.5	UnDef	2.8	5.
18.70	1.0E-07	-0.03	6.6	1.08	6	6.6	26.3	32.8	53.9	UnDef	UnDef	3.0	UnDef	3.2	6.
18.86	1.0E-07	-0.02	8.2	0.87	6	7.9	31.4	39.3	46.4	UnDef	UnDef	3.0	UnDef	3.8	7.
19.03	1.0E-07	-0.02	8.9	0.80	6	8.4	33.8	42.2	43.7	UnDef	UnDef	3.0	UnDef	4.1	8.
19.19	5.0E-06	-0.02	9.5	0.75	6	8.9	35.7	44.6	41.8	UnDef	UnDef	3.0	UnDef	4.4	8.
19.36	1.0E-07	-0.02	9.3	0.76	6	8.8	35.2	44.0	42.3	UnDef	UnDef	3.0	UnDef	4.3	8.
19.52	5.0E-05	-0.02	10.9	0.65	6	10.1	40.5	50.7	37.5	30	30.0	3.0	0.05	4.0	7.
19.68	5.0E-05	-0.02	10.8	0.65	6	10.1	40.4	50.5	37.7	30	30.0	3.0	0.05	4.0	7.
19.85	5.0E-05	-0.02	11.0	0.64	6	10.3	41.1	51.4	37.2	30	30.0	3.0	0.05	4.0	8.
20.01	5.0E-05	-0.01	11.8	0.59	7	11.0	43.9	54.8	35.2	30	30.0	3.0	0.05	4.3	8.
20.18	5.0E-05	-0.01	12.3	0.56	7	11.5	38.5	49.9	33.8	30	30.0	3.0	0.05	4.2	8.
20.34	5.0E-05	-0.01	13.3	0.41	7	12.3	0.0	12.3	5.0	32	30.0	6.0	0.07	0.0	4.
20.51	5.0E-05	-0.01	15.1	0.45	7	13.9	0.0	13.9	5.0	32	30.0	6.0	0.05	0.0	5.
20.67	5.0E-05	-0.01	18.1	0.60	7	16.4	24.9	41.3	27.6	32	30.0	6.0	0.01	3.9	10.
20.83	5.0E-05	-0.01	20.4	0.73	7	18.5	26.4	44.8	27.0	34	30.0	6.0	-0.01	4.2	11.
21.00	5.0E-05	-0.01	23.2	0.81	7	20.9	26.4	47.2	25.9	34	30.0	6.0	-0.03	4.4	12.
21.16	5.0E-05	0.00	28.2	0.80	7	25.1	23.2	48.4	23.0	36	30.0	6.0	-0.05	4.2	14.
21.33	5.0E-04	0.00	33.5	0.87	7	29.7	22.8	52.5	21.3	36	32.5	1.0	-0.07	3.6	13.
21.49	5.0E-04	0.00	35.9	0.88	7	31.9	22.3	54.2	20.4	38	34.5	1.0	-0.08	3.6	14.
21.65	5.0E-04	0.00	38.0	0.72	7	33.8	18.5	52.2	18.2	38	36.2	1.0	-0.07	3.1	14.
21.82	5.0E-04	0.00	43.6	0.75	7	38.7	17.8	56.5	16.8	38	40.1	1.0	-0.09	3.1	15.
21.98	5.0E-04	0.00	43.8	0.86	7	39.0	20.1	59.1	17.7	38	40.3	1.0	-0.10	3.4	16.
22.15	5.0E-04	0.00	44.9	0.89	7	40.1	20.6	60.6	17.7	38	41.1	1.0	-0.10	3.5	16.
22.31	5.0E-04	0.00	44.9	0.94	7	40.1	21.8	61.9	18.2	38	41.1	1.0	-0.11	3.7	16.
22.47	5.0E-04	0.00	45.8	0.95	7	41.1	21.7	62.8	18.0	38	41.8	1.0	-0.11	3.7	17.
22.64	5.0E-04	0.00	50.0	0.96	7	44.8	21.4	66.2	17.1	38	44.3	1.0	-0.12	3.7	18.
22.80	5.0E-04	0.00	52.3	0.91	7	47.0	20.0	67.0	16.2	38	45.6	1.0	-0.12	3.5	18.
22.97	5.0E-04	0.00	54.4	0.85	9	49.0	18.4	67.4	15.2	40	46.8	1.0	-0.12	3.3	19.

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Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
23.13	5.0E-04	0.00	49.8	0.90	7	45.1	20.2	65.3	16.6	38	44.5	1.0	-0.11	3.5	18.
23.29	5.0E-04	0.00	45.2	0.93	7	41.2	21.8	63.0	18.0	38	41.8	1.0	-0.11	3.7	17.
23.46	5.0E-04	0.00	40.4	1.03	7	37.1	25.3	62.4	20.2	38	38.8	1.0	-0.10	4.1	16.
23.62	5.0E-04	0.00	40.3	1.00	7	37.0	24.7	61.7	20.0	38	38.8	1.0	-0.10	4.0	16.
23.79	5.0E-04	0.00	44.8	1.14	7	41.2	26.7	67.9	19.7	38	41.8	1.0	-0.12	4.4	17.
23.95	5.0E-05	0.00	38.2	2.06	7	35.4	54.6	90.1	27.7	38	37.5	6.0	-0.16	8.5	22.
24.11	5.0E-07	0.00	17.1	3.67	4	16.6	66.4	83.0	49.7	UnDef	UnDef	6.0	UnDef	10.8	21.
24.28	5.0E-08	0.00	10.4	4.03	1	10.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
24.44	5.0E-06	0.02	8.9	2.66	4	9.4	37.6	47.0	59.0	UnDef	UnDef	3.0	UnDef	4.6	9.
24.61	5.0E-07	0.06	7.2	2.48	4	7.8	31.3	39.2	63.5	UnDef	UnDef	3.0	UnDef	5.1	10.
24.77	5.0E-07	0.14	5.8	2.25	4	6.6	26.4	33.0	67.8	UnDef	UnDef	1.5	UnDef	4.3	8.
24.93	1.0E-07	0.19	5.7	0.61	6	6.6	26.4	32.9	51.5	UnDef	UnDef	1.5	UnDef	3.2	6.
25.10	5.0E-07	0.23	5.3	2.88	1	6.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
25.26	5.0E-08	0.28	6.0	5.04	1	6.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
25.43	5.0E-05	0.07	26.4	1.93	6	25.5	71.3	96.8	32.6	36	30.0	6.0	-0.11	8.5	18.
25.59	5.0E-05	0.01	48.4	2.00	7	45.6	48.2	93.8	24.2	38	44.8	6.0	-0.19	8.5	26.
25.75	5.0E-06	0.00	36.2	3.11	6	34.5	114.0	148.5	33.7	UnDef	UnDef	6.0	UnDef	15.6	32.
25.92	5.0E-08	0.01	17.6	5.06	1	17.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
26.08	5.0E-08	0.01	11.7	4.36	1	12.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
26.25	5.0E-08	0.03	9.9	4.11	1	10.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
26.41	5.0E-08	0.05	10.9	5.27	1	11.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
26.57	5.0E-05	0.01	45.3	2.08	7	43.3	52.7	96.0	25.6	38	43.3	6.0	-0.18	8.9	25.
26.74	5.0E-05	0.01	39.7	2.59	6	38.3	76.4	114.7	30.0	38	39.7	6.0	-0.20	10.7	25.
26.90	5.0E-05	0.01	35.6	2.75	6	34.6	93.2	127.8	32.3	38	36.8	6.0	-0.19	11.4	24.
27.07	5.0E-05	0.00	30.4	2.59	6	29.8	102.0	131.8	34.0	36	32.6	6.0	-0.16	10.9	22.
27.23	5.0E-05	0.00	28.5	2.05	6	28.1	73.4	101.5	32.1	36	30.9	6.0	-0.13	9.1	20.
27.39	5.0E-05	-0.01	27.1	2.51	6	26.8	107.2	134.0	35.5	36	30.0	6.0	-0.15	10.5	21.
27.56	5.0E-05	-0.01	25.8	2.42	6	25.7	102.6	128.3	35.8	34	30.0	6.0	-0.14	10.0	20.
27.72	5.0E-05	-0.01	36.0	1.81	7	35.3	51.2	86.5	27.2	38	37.4	6.0	-0.14	8.1	22.
27.89	5.0E-05	-0.01	41.7	1.90	7	40.8	49.9	90.7	25.6	38	41.6	6.0	-0.16	8.4	24.
28.05	5.0E-05	-0.01	42.6	2.07	7	41.7	55.2	96.9	26.3	38	42.2	6.0	-0.18	9.0	25.
28.21	5.0E-05	-0.01	47.2	2.00	7	46.2	50.5	96.6	24.6	38	45.1	6.0	-0.18	8.8	26.
28.38	5.0E-05	-0.01	50.5	2.13	7	49.4	53.2	102.6	24.4	38	47.1	10.0	-0.20	9.3	28.
28.54	5.0E-05	-0.01	54.0	2.34	7	52.9	58.1	110.9	24.6	40	49.0	10.0	-0.22	10.1	30.
28.71	5.0E-04	-0.01	70.7	1.81	7	68.9	40.0	108.9	18.8	40	56.6	1.0	-0.22	6.7	29.
28.87	5.0E-04	-0.01	90.4	1.90	7	87.9	40.0	128.0	16.7	42	63.6	1.0	-0.25	7.0	35.
29.04	5.0E-05	-0.01	84.9	2.62	7	82.8	59.6	142.4	20.7	42	61.9	10.0	-0.29	11.5	43.
29.20	5.0E-06	-0.01	54.8	3.97	6	54.2	125.9	180.1	31.2	UnDef	UnDef	10.0	UnDef	20.6	47.
29.36	5.0E-07	-0.02	39.8	4.38	6	39.8	159.4	199.2	37.3	UnDef	UnDef	6.0	UnDef	26.0	52.
29.53	5.0E-05	-0.02	49.3	2.62	7	49.1	70.8	119.9	27.1	38	46.9	6.0	-0.23	11.3	30.
29.69	5.0E-04	-0.02	57.3	1.94	7	56.9	46.4	103.4	21.8	40	51.1	1.0	-0.20	7.3	25.
29.86	5.0E-05	-0.02	41.5	2.77	6	41.7	85.5	127.2	30.2	38	42.2	6.0	-0.21	11.8	28.
30.02	5.0E-06	-0.03	29.4	4.06	6	30.1	120.5	150.7	41.0	UnDef	UnDef	6.0	UnDef	14.7	29.
30.18	5.0E-07	-0.04	25.7	4.07	6	26.6	106.4	133.0	43.4	UnDef	UnDef	6.0	UnDef	17.4	34.
30.35	5.0E-06	-0.04	23.5	3.79	6	24.5	98.0	122.4	44.0	UnDef	UnDef	6.0	UnDef	12.0	24.
30.51	5.0E-07	-0.04	20.7	4.08	4	21.8	87.4	109.2	47.5	UnDef	UnDef	6.0	UnDef	14.2	28.
30.68	5.0E-07	-0.05	20.5	4.11	4	21.7	86.7	108.3	47.9	UnDef	UnDef	6.0	UnDef	14.1	28.
30.84	5.0E-06	-0.04	22.8	3.59	6	23.9	95.8	119.7	43.7	UnDef	UnDef	6.0	UnDef	11.7	23.
31.00	5.0E-06	-0.04	22.8	3.45	6	24.0	95.9	119.9	43.1	UnDef	UnDef	6.0	UnDef	11.7	23.
31.17	5.0E-06	-0.04	23.2	3.50	6	24.5	97.9	122.3	43.0	UnDef	UnDef	6.0	UnDef	12.0	23.
31.33	5.0E-06	-0.03	29.2	3.10	6	30.5	122.0	152.5	37.1	UnDef	UnDef	6.0	UnDef	14.9	29.
31.50	5.0E-06	-0.03	30.7	3.14	6	32.0	127.8	159.8	36.5	UnDef	UnDef	6.0	UnDef	15.6	31.
31.66	5.0E-05	-0.04	28.2	2.77	6	29.6	118.3	147.9	36.2	36	32.4	6.0	-0.17	11.6	23.
31.82	5.0E-06	-0.04	24.8	2.98	6	26.3	105.1	131.3	39.4	UnDef	UnDef	6.0	UnDef	12.9	25.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
31.99	5.0E-08	-0.06	15.5	5.00	1	17.1	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
32.15	5.0E-08	-0.08	11.5	5.52	1	13.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
32.32	5.0E-06	-0.03	25.8	3.39	6	27.5	109.9	137.4	40.5	UnDef	UnDef	6.0	UnDef	13.4	26.
32.48	5.0E-08	-0.05	19.8	4.65	1	21.5	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
32.64	5.0E-08	-0.07	13.1	6.41	1	14.8	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
32.81	5.0E-07	-0.05	18.8	4.34	1	20.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
32.97	5.0E-07	-0.05	20.2	4.17	1	22.0	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
33.14	5.0E-07	-0.05	17.7	4.10	1	19.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
33.30	5.0E-07	-0.07	15.1	4.10	1	17.0	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
33.46	5.0E-08	-0.10	10.0	5.43	1	11.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
33.63	5.0E-08	-0.11	8.8	5.59	1	10.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
33.79	5.0E-08	-0.14	7.2	6.21	1	9.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
33.96	5.0E-08	-0.10	9.4	5.03	1	11.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
34.12	5.0E-07	-0.08	11.7	3.69	1	13.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
34.28	5.0E-08	-0.12	8.4	4.72	1	10.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
34.45	5.0E-08	-0.14	7.0	4.29	1	9.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
34.61	5.0E-08	-0.18	5.3	4.81	1	7.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
34.78	5.0E-08	-0.19	5.1	5.00	1	7.0	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
34.94	5.0E-07	-0.17	5.6	3.25	1	7.5	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
35.10	5.0E-07	-0.19	4.9	3.51	1	6.8	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
35.27	5.0E-07	-0.18	4.7	3.59	1	6.7	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
35.43	5.0E-08	-0.17	5.1	5.12	1	7.0	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
35.60	5.0E-08	-0.12	7.3	4.90	1	9.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
35.76	5.0E-08	-0.11	8.1	5.23	1	10.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
35.92	5.0E-06	-0.08	10.3	3.52	1	12.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
36.09	5.0E-07	-0.11	7.8	3.84	1	9.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
36.25	5.0E-08	-0.17	5.2	5.10	1	7.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
36.42	5.0E-08	-0.16	5.3	4.77	1	7.4	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
36.58	5.0E-08	-0.16	5.2	4.88	1	7.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
36.74	5.0E-08	-0.16	5.1	4.81	1	7.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
36.91	5.0E-08	-0.16	5.1	4.72	1	7.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
37.07	5.0E-08	-0.16	5.0	4.62	1	7.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
37.24	5.0E-08	-0.16	5.0	4.46	1	7.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
37.40	5.0E-07	-0.16	5.2	4.11	1	7.3	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
37.57	5.0E-07	-0.17	4.6	4.08	1	6.7	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
37.73	5.0E-07	-0.19	4.3	3.80	1	6.4	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
37.89	5.0E-07	-0.19	4.1	3.52	1	6.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
38.06	5.0E-07	-0.20	4.0	3.62	1	6.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
38.22	5.0E-06	-0.19	4.0	2.12	4	6.1	24.4	30.5	77.8	UnDef	UnDef	1.5	UnDef	3.0	6.
38.39	5.0E-06	-0.20	3.9	2.16	4	6.0	24.1	30.1	78.9	UnDef	UnDef	1.5	UnDef	2.9	5.
38.55	5.0E-06	-0.19	3.8	2.18	4	6.0	23.9	29.9	79.4	UnDef	UnDef	1.5	UnDef	2.9	5.
38.71	5.0E-06	-0.19	3.8	2.20	4	5.9	23.7	29.7	80.1	UnDef	UnDef	1.5	UnDef	2.9	5.
38.88	5.0E-06	-0.19	3.7	2.25	4	5.8	23.4	29.2	81.2	UnDef	UnDef	1.5	UnDef	2.9	5.
39.04	5.0E-07	-0.20	3.5	2.61	1	5.6	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
39.21	5.0E-06	-0.19	3.8	2.63	1	5.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
39.37	5.0E-06	-0.17	4.2	2.37	4	6.4	25.5	31.9	78.4	UnDef	UnDef	1.5	UnDef	3.1	6.
39.53	5.0E-06	-0.19	3.7	2.42	4	5.9	23.7	29.6	82.3	UnDef	UnDef	1.5	UnDef	2.9	5.
39.70	5.0E-06	-0.19	3.7	2.41	4	5.9	23.8	29.7	82.1	UnDef	UnDef	1.5	UnDef	2.9	5.
39.86	5.0E-07	-0.17	4.1	2.80	1	6.3	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
40.03	5.0E-07	-0.16	4.3	2.98	1	6.6	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
40.19	5.0E-07	-0.16	4.4	3.52	1	6.7	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
40.35	5.0E-07	-0.16	4.2	3.42	1	6.5	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
40.52	5.0E-06	-0.11	6.2	1.94	4	8.7	34.8	43.5	63.6	UnDef	UnDef	1.5	UnDef	4.3	8.
40.68	5.0E-06	-0.16	4.2	2.46	4	6.6	26.3	32.8	78.5	UnDef	UnDef	1.5	UnDef	3.2	6.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
40.85	5.0E-06	-0.20	3.3	2.42	4	5.6	22.2	27.8	86.2	UnDef	UnDef	1.5	UnDef	2.7	5.
41.01	5.0E-06	-0.18	3.5	2.26	4	5.8	23.2	29.0	82.8	UnDef	UnDef	1.5	UnDef	2.8	5.
41.17	5.0E-06	-0.18	3.5	2.24	4	5.8	23.3	29.2	82.6	UnDef	UnDef	1.5	UnDef	2.9	5.
41.34	5.0E-06	-0.20	3.2	1.95	4	5.5	22.1	27.6	83.0	UnDef	UnDef	1.5	UnDef	2.7	5.
41.50	5.0E-06	-0.20	3.2	1.72	4	5.5	21.9	27.4	81.5	UnDef	UnDef	1.5	UnDef	2.7	5.
41.67	5.0E-06	-0.19	3.3	1.66	4	5.6	22.5	28.1	79.6	UnDef	UnDef	1.5	UnDef	2.8	5.
41.83	5.0E-06	-0.19	3.3	1.68	4	5.6	22.3	27.9	80.3	UnDef	UnDef	1.5	UnDef	2.7	5.
41.99	5.0E-06	-0.19	3.3	1.88	4	5.6	22.6	28.2	81.7	UnDef	UnDef	1.5	UnDef	2.8	5.
42.16	5.0E-06	-0.19	3.2	2.21	4	5.5	22.0	27.4	86.0	UnDef	UnDef	1.5	UnDef	2.7	5.
42.32	5.0E-06	-0.16	3.8	2.24	4	6.2	24.8	31.1	80.2	UnDef	UnDef	1.5	UnDef	3.0	6.
42.49	5.0E-06	-0.17	3.5	2.17	4	5.9	23.8	29.7	81.9	UnDef	UnDef	1.5	UnDef	2.9	5.
42.65	5.0E-06	-0.18	3.4	1.81	4	5.8	23.2	28.9	80.2	UnDef	UnDef	1.5	UnDef	2.8	5.
42.81	5.0E-06	-0.17	3.4	1.81	4	5.8	23.1	28.9	80.4	UnDef	UnDef	1.5	UnDef	2.8	5.
42.98	5.0E-06	-0.17	3.5	1.73	4	6.0	23.8	29.8	78.3	UnDef	UnDef	1.5	UnDef	2.9	5.
43.14	5.0E-06	-0.17	3.3	1.60	4	5.7	22.9	28.7	79.1	UnDef	UnDef	1.5	UnDef	2.8	5.
43.31	5.0E-06	-0.17	3.3	1.59	4	5.8	23.0	28.8	78.8	UnDef	UnDef	1.5	UnDef	2.8	5.
43.47	5.0E-06	-0.17	3.4	1.54	4	5.9	23.6	29.5	77.2	UnDef	UnDef	1.5	UnDef	2.9	5.
43.63	5.0E-06	-0.17	3.4	1.57	4	5.8	23.3	29.1	78.2	UnDef	UnDef	1.5	UnDef	2.8	5.
43.80	5.0E-06	-0.17	3.3	1.83	4	5.7	22.9	28.7	81.5	UnDef	UnDef	1.5	UnDef	2.8	5.
43.96	5.0E-06	-0.16	3.5	1.50	4	6.0	23.9	29.9	76.4	UnDef	UnDef	1.5	UnDef	2.9	5.
44.13	5.0E-06	-0.16	3.4	1.75	4	5.9	23.6	29.5	79.6	UnDef	UnDef	1.5	UnDef	2.9	5.
44.29	5.0E-06	-0.16	3.5	1.69	4	6.0	24.1	30.1	78.1	UnDef	UnDef	1.5	UnDef	3.0	5.
44.45	5.0E-06	-0.15	3.5	1.47	4	6.1	24.3	30.3	75.7	UnDef	UnDef	1.5	UnDef	3.0	5.
44.62	5.0E-06	-0.16	3.4	1.50	4	6.0	23.9	29.9	76.8	UnDef	UnDef	1.5	UnDef	2.9	5.
44.78	5.0E-06	-0.17	3.2	1.83	4	5.7	22.9	28.6	82.1	UnDef	UnDef	1.5	UnDef	2.8	5.
44.95	5.0E-06	-0.15	3.5	1.68	4	6.0	24.2	30.2	78.2	UnDef	UnDef	1.5	UnDef	3.0	5.
45.11	5.0E-06	-0.14	3.5	1.67	4	6.1	24.3	30.3	78.0	UnDef	UnDef	1.5	UnDef	3.0	5.
45.28	5.0E-06	-0.14	3.6	1.63	4	6.2	24.7	30.8	76.9	UnDef	UnDef	1.5	UnDef	3.0	6.
45.44	5.0E-06	-0.14	3.6	1.63	4	6.2	24.6	30.8	77.1	UnDef	UnDef	1.5	UnDef	3.0	6.
45.60	5.0E-06	-0.14	3.5	1.65	4	6.1	24.4	30.5	77.8	UnDef	UnDef	1.5	UnDef	3.0	6.
45.77	5.0E-06	-0.14	3.4	2.97	1	6.0	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
45.93	1.0E-15	-0.13	3.7	10.00	1	6.3	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
46.10	5.0E-08	-0.05	9.1	5.38	1	12.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
46.26	5.0E-08	-0.14	5.0	4.84	1	7.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
46.42	5.0E-06	-0.15	4.6	2.17	4	7.4	29.8	37.2	73.7	UnDef	UnDef	1.5	UnDef	3.6	7.
46.59	5.0E-06	-0.15	4.4	2.44	4	7.2	28.8	36.0	77.2	UnDef	UnDef	1.5	UnDef	3.5	7.
46.75	5.0E-07	-0.22	3.0	3.82	1	5.6	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
46.92	5.0E-07	-0.21	3.1	3.41	1	5.7	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
47.08	5.0E-07	-0.22	2.9	3.45	1	5.5	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
47.24	5.0E-07	-0.20	3.1	3.16	1	5.8	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
47.41	5.0E-07	-0.20	3.1	3.43	1	5.7	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
47.57	5.0E-07	-0.19	3.2	3.24	1	5.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
47.74	5.0E-06	-0.17	3.5	2.82	1	6.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
47.90	5.0E-06	-0.20	3.0	2.76	1	5.7	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
48.06	5.0E-06	-0.17	3.4	2.47	4	6.1	24.4	30.5	85.9	UnDef	UnDef	1.5	UnDef	3.0	6.
48.23	5.0E-06	-0.17	3.2	2.59	1	5.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
48.39	5.0E-06	-0.17	3.1	2.63	1	5.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
48.56	5.0E-06	-0.17	3.1	2.67	1	5.8	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
48.72	5.0E-06	-0.16	3.3	2.30	4	6.0	24.2	30.2	85.4	UnDef	UnDef	1.5	UnDef	3.0	5.
48.88	5.0E-06	-0.16	3.2	2.32	4	6.0	24.0	30.0	86.0	UnDef	UnDef	1.5	UnDef	2.9	5.
49.05	5.0E-06	-0.15	3.3	2.26	4	6.1	24.4	30.5	84.8	UnDef	UnDef	1.5	UnDef	3.0	6.
49.21	5.0E-06	-0.16	3.2	2.31	4	6.0	24.1	30.1	85.9	UnDef	UnDef	1.5	UnDef	2.9	5.
49.38	5.0E-06	-0.16	3.2	2.31	4	6.0	24.1	30.1	86.1	UnDef	UnDef	1.5	UnDef	2.9	5.
49.54	5.0E-06	-0.16	3.2	2.36	4	5.9	23.8	29.7	87.1	UnDef	UnDef	1.5	UnDef	2.9	5.

Gregg In Situ, Inc.
Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
49.70	5.0E-06	-0.16	3.1	2.36	4	5.9	23.7	29.7	87.3	UnDef	UnDef	1.5	UnDef	2.9	5.
49.87	5.0E-06	-0.17	3.0	2.48	4	5.8	23.0	28.8	90.0	UnDef	UnDef	1.0	UnDef	2.8	5.
50.03	5.0E-06	-0.16	3.0	2.49	4	5.7	23.0	28.7	90.2	UnDef	UnDef	1.0	UnDef	2.8	5.
50.20	5.0E-06	-0.15	3.2	2.29	4	6.0	24.2	30.2	86.0	UnDef	UnDef	1.5	UnDef	3.0	5.
50.36	5.0E-06	-0.15	3.1	2.33	4	6.0	23.9	29.9	87.2	UnDef	UnDef	1.5	UnDef	2.9	5.
50.52	5.0E-06	-0.16	3.0	2.67	1	5.8	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
50.69	5.0E-06	-0.13	3.5	2.29	4	6.4	25.6	32.0	83.4	UnDef	UnDef	1.5	UnDef	3.1	6.
50.85	5.0E-06	-0.14	3.2	2.51	4	6.0	24.1	30.1	88.3	UnDef	UnDef	1.5	UnDef	2.9	5.
51.02	5.0E-06	-0.15	3.0	2.20	4	5.8	23.4	29.2	87.6	UnDef	UnDef	1.0	UnDef	2.9	5.
51.18	5.0E-06	-0.14	3.1	2.12	4	6.0	23.9	29.8	85.9	UnDef	UnDef	1.0	UnDef	2.9	5.
51.34	5.0E-06	-0.15	2.9	2.22	4	5.8	23.2	29.0	88.5	UnDef	UnDef	1.0	UnDef	2.8	5.
51.51	5.0E-06	-0.13	3.2	2.22	4	6.2	24.6	30.8	85.2	UnDef	UnDef	1.5	UnDef	3.0	6.
51.67	5.0E-06	-0.12	3.3	2.18	4	6.2	24.9	31.1	84.5	UnDef	UnDef	1.5	UnDef	3.0	6.
51.84	5.0E-06	-0.12	3.2	2.24	4	6.1	24.5	30.6	85.9	UnDef	UnDef	1.5	UnDef	3.0	6.
52.00	5.0E-06	-0.12	3.2	2.02	4	6.1	24.6	30.7	84.0	UnDef	UnDef	1.5	UnDef	3.0	6.
52.16	5.0E-06	-0.11	3.2	2.01	4	6.2	24.7	30.9	83.7	UnDef	UnDef	1.5	UnDef	3.0	6.
52.33	5.0E-06	-0.11	3.3	1.94	4	6.3	25.2	31.5	82.2	UnDef	UnDef	1.5	UnDef	3.1	6.
52.49	5.0E-06	-0.11	3.3	2.16	4	6.3	25.0	31.3	84.4	UnDef	UnDef	1.5	UnDef	3.1	6.
52.66	5.0E-06	-0.11	3.1	2.28	4	6.0	24.2	30.2	87.2	UnDef	UnDef	1.0	UnDef	3.0	5.
52.82	5.0E-06	-0.10	3.2	2.36	4	6.2	25.0	31.2	86.2	UnDef	UnDef	1.5	UnDef	3.1	6.
52.98	5.0E-06	-0.10	3.3	2.35	4	6.3	25.1	31.4	86.0	UnDef	UnDef	1.5	UnDef	3.1	6.
53.15	5.0E-06	-0.10	3.3	2.33	4	6.3	25.2	31.5	85.8	UnDef	UnDef	1.5	UnDef	3.1	6.
53.31	5.0E-06	-0.09	3.5	1.99	4	6.6	26.4	33.0	80.8	UnDef	UnDef	1.5	UnDef	3.2	6.
53.48	5.0E-06	-0.09	3.5	1.99	4	6.6	26.3	32.9	80.9	UnDef	UnDef	1.5	UnDef	3.2	6.
53.64	5.0E-06	-0.09	3.4	2.23	4	6.5	25.9	32.4	83.8	UnDef	UnDef	1.5	UnDef	3.2	6.
53.81	5.0E-06	-0.09	3.3	2.29	4	6.4	25.5	31.8	85.1	UnDef	UnDef	1.5	UnDef	3.1	6.
53.97	5.0E-06	-0.08	3.4	2.22	4	6.5	26.0	32.5	83.7	UnDef	UnDef	1.5	UnDef	3.2	6.
54.13	5.0E-06	-0.08	3.5	2.17	4	6.6	26.4	33.0	82.6	UnDef	UnDef	1.5	UnDef	3.2	6.
54.30	5.0E-06	-0.08	3.4	2.00	4	6.6	26.2	32.8	81.7	UnDef	UnDef	1.5	UnDef	3.2	6.
54.46	5.0E-06	-0.08	3.4	2.19	4	6.5	26.2	32.7	83.3	UnDef	UnDef	1.5	UnDef	3.2	6.
54.63	5.0E-06	-0.07	3.5	2.14	4	6.6	26.5	33.2	82.3	UnDef	UnDef	1.5	UnDef	3.2	6.
54.79	5.0E-06	-0.05	3.6	2.25	4	6.8	27.1	33.8	82.3	UnDef	UnDef	1.5	UnDef	3.3	6.
54.95	5.0E-06	-0.05	3.4	2.36	4	6.6	26.3	32.8	84.6	UnDef	UnDef	1.5	UnDef	3.2	6.
55.12	5.0E-06	-0.04	3.6	2.21	4	6.9	27.4	34.3	81.5	UnDef	UnDef	1.5	UnDef	3.4	6.
55.28	5.0E-06	-0.04	3.6	2.19	4	6.9	27.5	34.4	81.3	UnDef	UnDef	1.5	UnDef	3.4	6.
55.45	5.0E-06	-0.04	3.6	2.01	4	6.9	27.6	34.5	79.6	UnDef	UnDef	1.5	UnDef	3.4	6.
55.61	5.0E-06	-0.03	3.8	1.75	4	7.2	28.7	35.8	75.7	UnDef	UnDef	1.5	UnDef	3.5	7.
55.77	5.0E-06	-0.03	3.5	1.90	4	6.8	27.1	33.8	79.9	UnDef	UnDef	1.5	UnDef	3.3	6.
55.94	5.0E-06	-0.03	3.6	2.03	4	6.9	27.4	34.3	80.4	UnDef	UnDef	1.5	UnDef	3.4	6.
56.10	5.0E-06	-0.03	3.5	2.24	4	6.8	27.1	33.9	82.6	UnDef	UnDef	1.5	UnDef	3.3	6.
56.27	5.0E-06	-0.02	3.6	2.02	4	6.9	27.5	34.4	80.3	UnDef	UnDef	1.5	UnDef	3.4	6.
56.43	5.0E-06	-0.02	3.4	2.29	4	6.7	26.7	33.4	84.0	UnDef	UnDef	1.5	UnDef	3.3	6.
56.59	5.0E-06	-0.02	3.5	2.23	4	6.8	27.2	34.0	82.7	UnDef	UnDef	1.5	UnDef	3.3	6.
56.76	5.0E-06	-0.01	3.5	2.21	4	6.8	27.3	34.1	82.4	UnDef	UnDef	1.5	UnDef	3.3	6.
56.92	5.0E-06	-0.01	3.8	2.05	4	7.2	28.7	35.9	78.8	UnDef	UnDef	1.5	UnDef	3.5	7.
57.09	5.0E-06	0.00	3.4	2.12	4	6.7	26.6	33.3	83.1	UnDef	UnDef	1.5	UnDef	3.3	6.
57.25	5.0E-06	0.00	3.6	3.65	1	6.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
57.41	5.0E-07	0.01	3.6	4.65	1	6.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
57.58	5.0E-06	0.02	6.9	2.67	4	11.1	44.6	55.7	65.9	UnDef	UnDef	3.0	UnDef	5.5	10.
57.74	5.0E-08	-0.18	3.4	5.24	1	6.7	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
57.91	5.0E-06	-0.15	4.0	3.11	1	7.5	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
58.07	5.0E-06	-0.13	3.9	3.02	1	7.4	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
58.23	5.0E-06	-0.14	3.5	3.34	1	6.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
58.40	5.0E-06	-0.13	3.6	3.09	1	7.0	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
58.56	5.0E-06	-0.13	3.6	3.24	1	7.0	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
58.73	5.0E-06	-0.12	3.7	3.01	1	7.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
58.89	5.0E-06	-0.12	3.7	3.00	1	7.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
59.05	5.0E-06	-0.11	3.8	3.08	1	7.3	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
59.22	5.0E-06	-0.11	3.9	3.13	1	7.4	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
59.38	5.0E-06	-0.11	3.9	2.95	1	7.5	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
59.55	5.0E-06	-0.10	4.2	2.71	4	7.9	31.7	39.6	80.1	UnDef	UnDef	1.5	UnDef	3.9	7.
59.71	5.0E-06	-0.09	4.2	2.75	1	7.8	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
59.87	5.0E-06	-0.09	4.1	2.62	4	7.8	31.2	39.0	80.3	UnDef	UnDef	1.5	UnDef	3.8	7.
60.04	5.0E-06	-0.09	4.0	2.41	4	7.7	30.7	38.4	79.6	UnDef	UnDef	1.5	UnDef	3.8	7.
60.20	5.0E-06	-0.09	4.0	2.73	1	7.6	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
60.37	5.0E-06	-0.09	3.8	3.11	1	7.4	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
60.53	5.0E-06	-0.08	4.3	3.14	1	8.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
60.69	5.0E-06	-0.07	4.7	3.02	1	8.6	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
60.86	5.0E-06	-0.07	4.8	2.79	4	8.8	35.2	44.0	76.6	UnDef	UnDef	1.5	UnDef	4.3	8.
61.02	5.0E-06	-0.07	4.4	3.32	1	8.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
61.19	5.0E-06	-0.04	5.2	2.58	4	9.3	37.2	46.5	73.1	UnDef	UnDef	1.5	UnDef	4.5	9.
61.35	5.0E-06	-0.05	4.1	3.10	1	7.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
61.52	5.0E-06	-0.04	4.3	3.11	1	8.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
61.68	5.0E-06	-0.04	4.1	3.26	1	7.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
61.84	5.0E-06	-0.03	3.8	3.33	1	7.5	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
62.01	5.0E-06	-0.03	3.8	3.33	1	7.5	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
62.17	5.0E-06	-0.02	4.1	2.94	1	8.0	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
62.34	5.0E-06	-0.02	4.2	2.77	1	8.0	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
62.50	5.0E-06	-0.02	4.0	3.01	1	7.8	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
62.66	5.0E-06	-0.01	4.1	2.91	1	8.0	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
62.83	5.0E-06	-0.01	4.3	2.69	4	8.2	32.7	40.9	79.6	UnDef	UnDef	1.5	UnDef	4.0	8.
62.99	5.0E-06	0.00	4.3	2.43	4	8.2	32.7	40.9	78.0	UnDef	UnDef	1.5	UnDef	4.0	8.
63.16	5.0E-06	0.01	4.3	2.41	4	8.2	32.9	41.2	77.6	UnDef	UnDef	1.5	UnDef	4.0	8.
63.32	5.0E-06	0.01	4.5	3.26	1	8.5	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
63.48	5.0E-06	0.01	5.0	3.14	1	9.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
63.65	5.0E-07	0.02	5.3	4.29	1	9.6	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
63.81	5.0E-08	0.02	7.0	5.27	1	11.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
63.98	5.0E-06	0.01	11.0	3.76	1	17.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
64.14	5.0E-07	0.03	8.2	4.76	1	13.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
64.30	5.0E-05	0.04	9.0	2.63	4	14.6	58.3	72.9	58.7	30	30.0	3.0	-0.02	5.7	11.
64.47	5.0E-06	0.06	6.4	2.90	4	11.2	44.8	56.0	69.0	UnDef	UnDef	3.0	UnDef	5.5	11.
64.63	5.0E-06	0.18	4.8	3.20	1	9.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
64.80	5.0E-06	0.19	5.0	3.18	1	9.3	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
64.96	5.0E-06	0.19	5.3	3.88	1	9.7	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
65.12	5.0E-08	0.17	6.0	5.84	1	10.6	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
65.29	5.0E-07	0.13	8.8	4.49	1	14.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
65.45	5.0E-08	0.08	10.7	5.70	1	17.1	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
65.62	5.0E-08	0.06	13.1	5.62	1	20.3	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
65.78	5.0E-05	0.00	33.0	2.90	6	47.2	167.7	214.9	34.2	36	45.7	6.0	-0.19	17.6	36.
65.94	5.0E-05	-0.01	43.8	2.82	6	61.9	119.3	181.1	29.7	38	53.5	6.0	-0.22	17.0	41.
66.11	5.0E-05	-0.01	51.3	2.78	7	72.1	106.5	178.6	27.3	38	57.9	10.0	-0.24	16.8	45.
66.27	5.0E-05	-0.01	56.5	3.04	7	79.1	115.3	194.5	27.2	40	60.6	10.0	-0.27	18.3	49.
66.44	5.0E-04	-0.01	67.8	2.77	7	94.7	95.6	190.3	23.8	40	65.7	1.0	-0.27	14.2	45.
66.60	5.0E-04	-0.01	76.8	2.69	7	107.0	89.3	196.3	22.0	40	69.2	1.0	-0.28	13.9	48.
66.76	5.0E-04	-0.01	76.0	2.91	7	106.0	99.2	205.3	23.1	40	69.0	1.0	-0.30	15.0	49.
66.93	5.0E-05	-0.01	75.0	3.12	7	104.8	109.1	213.9	24.1	40	68.6	10.0	-0.31	19.2	60.
67.09	5.0E-05	-0.01	73.6	3.25	7	103.0	115.7	218.8	24.8	40	68.1	10.0	-0.32	19.9	60.
67.26	5.0E-05	-0.01	77.2	3.10	7	108.0	107.3	215.3	23.7	42	69.5	10.0	-0.31	19.2	61.

Run No: 98-0720-1458-3332
CPT File: 124C02.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
67.42	5.0E-04	-0.01	77.2	3.05	7	108.1	105.3	213.5	23.5	42	69.5	1.0	-0.31	15.7	51.
67.58	5.0E-04	-0.01	78.5	2.82	7	110.0	95.0	205.0	22.3	42	70.0	1.0	-0.29	14.6	50.
67.75	5.0E-04	-0.01	75.9	2.99	7	106.6	103.4	210.0	23.4	40	69.1	1.0	-0.30	15.5	50.
67.91	5.0E-05	-0.01	65.7	3.21	7	92.8	118.2	211.0	26.0	40	65.1	10.0	-0.30	19.6	55.
68.08	5.0E-05	-0.01	59.4	3.28	6	84.2	126.8	211.0	27.5	40	62.3	10.0	-0.29	19.9	52.
68.24	5.0E-05	-0.01	53.5	3.42	6	76.2	142.8	219.0	29.4	40	59.5	10.0	-0.29	20.5	50.
68.40	5.0E-05	-0.01	45.5	3.80	6	65.3	197.2	262.5	33.1	38	55.1	6.0	-0.29	22.7	43.
68.57	5.0E-06	-0.01	39.3	4.14	6	56.8	227.4	284.2	36.6	UnDef	UnDef	6.0	UnDef	27.8	55.
68.73	5.0E-06	-0.01	38.4	4.01	6	55.6	222.3	277.9	36.5	UnDef	UnDef	6.0	UnDef	27.2	54.
68.90	5.0E-06	-0.02	37.3	4.12	6	54.1	216.5	270.6	37.4	UnDef	UnDef	6.0	UnDef	26.5	53.
69.06	5.0E-06	-0.02	36.5	4.14	6	53.2	212.6	265.8	37.8	UnDef	UnDef	6.0	UnDef	26.0	52.
69.22	5.0E-06	-0.03	31.9	4.66	6	46.7	187.0	233.7	41.9	UnDef	UnDef	6.0	UnDef	22.9	45.
69.39	1.0E-15	-0.03	27.7	5.22	1	41.0	UnDef	UnDef	100.0	36	41.7	1.0	-0.33	UnDef	UnDe
69.55	1.0E-15	-0.04	24.2	5.69	1	36.3	UnDef	UnDef	100.0	34	38.2	1.0	-0.35	UnDef	UnDe
69.72	5.0E-08	-0.05	21.2	5.95	1	32.1	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
69.88	5.0E-08	-0.06	18.8	5.75	1	28.8	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
70.05	5.0E-08	-0.06	18.5	5.62	1	28.4	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
70.21	5.0E-08	-0.06	19.5	5.77	1	29.8	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
70.37	5.0E-08	-0.06	20.3	6.02	1	31.0	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
70.54	5.0E-08	-0.06	21.4	5.61	1	32.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
70.70	5.0E-05	-0.05	22.5	2.97	6	34.2	136.7	170.9	41.0	34	36.5	6.0	-0.15	13.4	26.
70.87	5.0E-06	-0.05	25.9	4.70	1	38.9	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
71.03	5.0E-08	-0.09	14.6	9.30	1	23.1	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
71.19	5.0E-06	-0.03	37.4	4.00	6	55.1	220.3	275.4	36.9	UnDef	UnDef	6.0	UnDef	27.0	53.
71.36	5.0E-05	-0.03	48.5	3.38	6	70.8	152.9	223.6	30.6	38	57.4	6.0	-0.27	20.7	48.
71.52	5.0E-05	-0.02	52.1	3.16	6	75.9	131.2	207.1	28.7	40	59.4	10.0	-0.27	19.5	49.
71.69	5.0E-05	-0.03	46.7	3.29	6	68.4	151.1	219.5	30.8	38	56.4	6.0	-0.26	20.3	47.
71.85	5.0E-05	-0.03	46.3	3.46	6	67.9	165.7	233.6	31.6	38	56.2	6.0	-0.27	21.2	47.
72.01	5.0E-05	-0.03	47.2	3.70	6	69.3	184.3	253.6	32.2	38	56.8	6.0	-0.29	22.6	49.
72.18	5.0E-05	-0.03	47.9	3.75	6	70.2	187.6	257.8	32.3	38	57.1	6.0	-0.30	23.0	50.
72.34	5.0E-05	-0.02	53.5	3.57	6	78.3	157.6	235.9	30.0	40	60.3	10.0	-0.30	22.0	52.
72.51	5.0E-05	-0.02	58.4	3.44	6	85.3	141.4	226.7	28.4	40	62.7	10.0	-0.30	21.4	54.
72.67	5.0E-05	-0.02	57.9	3.45	6	84.6	142.7	227.3	28.5	40	62.5	10.0	-0.30	21.4	54.
72.83	5.0E-05	-0.02	54.2	3.67	6	79.5	163.7	243.2	30.2	40	60.7	10.0	-0.31	22.6	53.
73.00	5.0E-06	-0.03	48.9	4.02	6	72.1	210.9	283.0	32.9	UnDef	UnDef	6.0	UnDef	30.8	66.
73.16	5.0E-06	-0.03	43.0	4.23	6	63.8	255.2	319.0	35.6	UnDef	UnDef	6.0	UnDef	31.2	62.
73.33	5.0E-06	-0.03	38.1	4.33	6	56.8	227.3	284.1	37.8	UnDef	UnDef	6.0	UnDef	27.8	55.
73.49	5.0E-06	-0.04	32.7	4.46	6	49.3	197.1	246.4	40.7	UnDef	UnDef	6.0	UnDef	24.1	48.
73.65	5.0E-06	-0.04	29.2	4.75	1	44.3	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
73.82	5.0E-06	-0.05	27.8	4.68	1	42.4	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
73.98	5.0E-06	-0.05	28.1	4.49	4	42.8	171.1	213.9	43.5	UnDef	UnDef	6.0	UnDef	20.9	41.
74.15	5.0E-06	-0.05	26.6	4.28	6	40.8	163.0	203.8	43.7	UnDef	UnDef	6.0	UnDef	19.9	39.
74.31	5.0E-08	-0.06	22.4	5.74	1	34.7	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
74.47	5.0E-08	-0.06	19.4	6.21	1	30.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
74.64	5.0E-08	-0.09	13.5	7.38	1	22.1	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
74.80	5.0E-08	-0.09	13.5	6.26	1	22.2	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
74.97	5.0E-08	-0.13	9.6	7.08	1	16.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
75.13	5.0E-08	-0.21	5.8	8.72	1	11.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
75.29	5.0E-08	-0.25	5.0	6.56	1	9.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
75.46	5.0E-08	-0.33	3.8	8.82	1	8.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
75.62	5.0E-08	-0.31	4.0	9.81	1	8.6	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
75.79	5.0E-08	-0.13	9.5	6.11	1	16.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
75.95	5.0E-06	-0.06	19.9	4.10	1	31.5	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
76.11	5.0E-04	-0.03	42.7	2.52	7	64.5	109.8	174.3	28.6	38	54.7	1.0	-0.20	13.7	34.

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Nce	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1,6
76.28	5.0E-05	-0.03	40.0	3.36	6	60.6	187.4	248.0	33.3	38	52.9	6.0	-0.25	21.3	45
76.44	5.0E-04	-0.02	48.2	2.56	7	72.5	104.8	177.4	27.1	38	58.1	1.0	-0.22	13.9	3[illegible]
76.61	5.0E-04	-0.02	51.9	2.21	7	78.0	84.4	162.4	24.5	40	60.2	1.0	-0.21	12.3	3[illegible]
76.77	5.0E-04	-0.01	55.8	1.98	7	83.8	72.3	156.1	22.4	40	62.2	1.0	-0.20	11.2	39
76.93	5.0E-04	0.00	62.9	1.88	7	94.0	65.9	159.9	20.4	40	65.5	1.0	-0.21	10.6	4[illegible]
77.10	5.0E-04	0.00	63.2	2.14	7	94.7	76.5	171.2	21.7	40	65.7	1.0	-0.22	12.0	4[illegible]
77.26	5.0E-04	0.00	62.9	2.26	7	94.3	81.5	175.8	22.4	40	65.6	1.0	-0.23	12.6	4[illegible]
77.43	5.0E-04	0.00	66.7	2.32	7	99.9	82.8	182.7	22.0	40	67.2	1.0	-0.24	12.9	4[illegible]
77.59	5.0E-04	0.00	69.8	2.46	7	104.6	88.0	192.6	22.1	40	68.6	1.0	-0.26	13.7	4[illegible]
77.75	5.0E-04	0.00	69.2	2.53	7	103.7	91.4	195.1	22.5	40	68.3	1.0	-0.26	14.0	4[illegible]
77.92	5.0E-04	0.00	65.2	2.73	7	98.0	102.0	200.1	24.1	40	66.7	1.0	-0.26	15.0	4[illegible]
78.08	5.0E-05	-0.01	57.3	3.16	6	86.6	130.5	217.1	27.5	40	63.1	10.0	-0.28	20.4	54.
78.25	5.0E-04	0.00	61.7	2.80	7	93.2	107.4	200.5	25.1	40	65.2	1.0	-0.26	15.3	4[illegible]
78.41	5.0E-04	-0.01	59.4	2.73	7	89.9	105.3	195.2	25.2	40	64.2	1.0	-0.25	14.9	44
78.58	5.0E-04	-0.01	55.1	2.85	7	83.7	115.3	199.0	26.7	40	62.2	1.0	-0.25	15.5	4[illegible]
78.74	5.0E-05	-0.01	50.4	3.01	6	76.8	130.0	206.9	28.5	38	59.7	10.0	-0.25	19.5	4[illegible]
78.90	5.0E-05	-0.01	49.2	3.16	6	75.1	142.2	217.4	29.5	38	59.1	6.0	-0.26	20.4	4[illegible]
79.07	5.0E-05	-0.01	45.5	3.54	6	69.8	183.9	253.7	32.1	38	57.0	6.0	-0.27	22.7	[illegible]
79.23	5.0E-05	-0.01	42.1	3.91	6	64.8	249.2	313.9	34.7	38	54.8	6.0	-0.29	25.0	5[illegible]
79.40	5.0E-06	-0.01	38.2	4.38	6	59.1	236.5	295.7	37.9	UnDef	UnDef	6.0	UnDef	28.9	5[illegible]
79.56	1.0E-15	-0.02	29.4	5.05	1	46.2	UnDef	UnDef	100.0	36	45.1	1.0	-0.32	UnDef	UnDe
79.72	5.0E-06	-0.02	27.9	4.21	6	44.1	176.5	220.6	42.5	UnDef	UnDef	6.0	UnDef	21.6	4[illegible]
79.89	5.0E-06	-0.03	29.0	4.05	6	45.7	182.8	228.5	41.3	UnDef	UnDef	6.0	UnDef	22.4	44
80.05	1.0E-15	-0.04	21.5	5.42	1	34.8	UnDef	UnDef	100.0	34	37.0	1.0	-0.30	UnDef	UnDe
80.22	5.0E-07	-0.05	18.8	4.98	1	30.8	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
80.38	5.0E-05	-0.03	27.7	3.55	6	43.9	175.6	219.5	40.1	36	43.7	6.0	-0.21	17.2	34.
80.54	5.0E-07	-0.05	18.1	4.80	1	29.7	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
80.71	5.0E-07	-0.07	14.3	4.95	1	24.2	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
80.87	5.0E-06	-0.08	12.3	4.06	1	21.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
81.04	5.0E-06	-0.11	8.6	4.47	1	15.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
81.20	5.0E-08	-0.20	4.7	7.52	1	9.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
81.36	5.0E-08	-0.18	5.1	5.94	1	10.5	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
81.53	5.0E-07	-0.17	5.3	5.10	1	10.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
81.69	5.0E-08	-0.25	3.5	5.96	1	8.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
81.86	5.0E-07	-0.25	3.5	5.19	1	8.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDe
82.02	5.0E-08	-0.30	2.9	5.84	1	7.3	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
82.18	5.0E-08	-0.32	2.7	5.93	1	7.1	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
82.35	5.0E-07	-0.30	2.9	5.52	1	7.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
82.51	5.0E-07	-0.30	2.8	5.30	1	7.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
82.68	5.0E-07	-0.30	2.8	5.11	1	7.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
82.84	5.0E-07	-0.30	2.8	4.94	1	7.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
83.00	5.0E-06	-0.29	2.9	4.48	1	7.4	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
83.17	5.0E-06	-0.30	2.8	4.41	1	7.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
83.33	5.0E-06	-0.30	2.8	4.41	1	7.1	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
83.50	5.0E-06	-0.31	2.7	4.41	1	7.0	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
83.66	5.0E-06	-0.31	2.7	4.41	1	7.0	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
83.82	5.0E-06	-0.30	2.7	4.64	1	7.1	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
83.99	5.0E-06	-0.29	2.9	4.56	1	7.3	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
84.15	5.0E-06	-0.30	2.7	4.81	1	7.1	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
84.32	5.0E-06	-0.31	2.6	4.59	1	7.0	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
84.48	5.0E-06	-0.31	2.6	4.34	1	6.9	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
84.64	5.0E-06	-0.31	2.5	4.11	1	6.8	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
84.81	5.0E-06	-0.30	2.6	4.15	1	6.9	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe
84.97	5.0E-06	-0.31	2.5	4.57	1	6.7	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDe

Gregg In Situ, Inc.
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Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
93.99	5.0E-08	-0.07	8.7	8.05	1	17.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
94.16	5.0E-08	-0.07	8.9	8.38	1	17.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
94.32	5.0E-08	-0.07	9.2	6.66	1	17.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
94.49	5.0E-08	-0.07	9.0	6.49	1	17.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
94.65	5.0E-08	-0.08	8.1	6.42	1	16.1	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
94.82	5.0E-08	-0.08	7.9	5.97	1	15.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
94.98	5.0E-08	-0.09	7.4	6.52	1	15.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
95.14	5.0E-08	-0.08	7.8	6.27	1	15.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
95.31	5.0E-08	-0.08	8.4	6.13	1	16.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
95.47	5.0E-08	-0.07	8.8	5.52	1	17.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
95.64	5.0E-08	-0.07	8.8	5.85	1	17.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
95.80	5.0E-08	-0.07	9.5	6.19	1	18.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
95.96	5.0E-08	-0.07	9.8	6.14	1	19.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
96.13	5.0E-07	-0.06	10.8	5.39	1	20.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
96.29	5.0E-07	-0.06	10.7	5.01	1	20.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
96.46	5.0E-08	-0.07	9.4	5.96	1	18.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
96.62	5.0E-08	-0.07	9.7	6.10	1	18.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
96.78	5.0E-07	-0.05	11.9	5.46	1	22.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
96.95	5.0E-07	-0.05	12.1	5.24	1	22.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
97.11	5.0E-08	-0.06	11.2	5.60	1	21.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
97.28	5.0E-08	-0.05	11.9	6.32	1	22.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
97.44	5.0E-07	-0.04	15.1	5.27	1	27.7	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
97.60	5.0E-08	-0.05	13.1	5.62	1	24.3	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
97.77	5.0E-07	-0.05	12.9	4.91	1	24.2	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
97.93	5.0E-07	-0.05	11.5	5.25	1	21.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
98.10	5.0E-07	-0.05	11.2	5.00	1	21.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
98.26	5.0E-07	-0.05	10.7	5.09	1	20.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
98.42	5.0E-07	-0.05	11.6	4.92	1	22.1	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
98.59	5.0E-08	-0.05	11.7	5.76	1	22.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
98.75	5.0E-07	-0.04	13.3	5.30	1	25.0	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
98.92	5.0E-06	-0.04	13.2	4.82	1	24.8	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
99.08	5.0E-06	-0.05	11.8	4.57	1	22.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
99.24	5.0E-06	-0.05	10.8	4.19	1	20.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
99.41	5.0E-07	-0.06	10.2	4.85	1	19.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
99.57	5.0E-06	-0.05	11.7	4.71	1	22.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
99.74	5.0E-07	-0.05	12.2	5.15	1	23.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
99.90	5.0E-06	-0.04	14.2	4.87	1	26.4	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
100.06	5.0E-07	-0.04	13.9	4.91	1	26.1	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
100.23	5.0E-07	-0.04	12.2	4.89	1	23.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
100.39	5.0E-06	-0.05	11.9	4.77	1	22.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
100.56	5.0E-07	-0.05	11.8	5.19	1	22.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
100.72	5.0E-06	-0.04	13.6	4.74	1	25.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
100.88	5.0E-07	-0.04	13.3	5.52	1	25.1	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
101.05	5.0E-07	-0.03	15.0	5.12	1	27.9	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
101.21	5.0E-07	-0.04	13.5	5.50	1	25.5	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
101.38	5.0E-07	-0.04	13.6	5.03	1	25.7	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
101.54	5.0E-07	-0.04	12.6	5.17	1	24.1	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
101.70	5.0E-07	-0.04	12.3	4.94	1	23.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
101.87	5.0E-07	-0.04	10.9	4.95	1	21.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
102.03	5.0E-07	-0.05	10.1	5.07	1	20.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
102.20	5.0E-08	-0.05	9.9	5.82	1	19.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
102.36	5.0E-06	-0.04	12.0	4.83	1	23.1	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
102.53	5.0E-07	-0.04	12.0	5.37	1	23.1	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
102.69	5.0E-07	-0.04	12.3	5.34	1	23.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60c
102.85	5.0E-06	-0.04	12.9	4.89	1	24.8	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
103.02	5.0E-07	-0.04	12.5	5.41	1	24.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
103.18	5.0E-08	-0.04	10.8	6.21	1	21.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
103.35	5.0E-08	-0.04	10.7	6.28	1	21.1	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
103.51	5.0E-08	-0.04	10.8	6.57	1	21.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
103.67	5.0E-08	-0.04	11.0	6.21	1	21.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
103.84	5.0E-07	-0.04	11.6	5.08	1	22.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
104.00	5.0E-07	-0.04	10.4	5.33	1	20.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
104.17	5.0E-07	-0.05	9.6	5.48	1	19.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
104.33	5.0E-06	-0.04	10.2	4.17	1	20.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
104.49	5.0E-06	-0.05	9.7	4.46	1	19.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
104.66	5.0E-06	-0.04	10.0	3.91	1	20.1	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
104.82	5.0E-06	-0.04	9.9	4.39	1	20.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
104.99	5.0E-08	-0.03	11.3	5.65	1	22.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
105.15	5.0E-08	-0.03	13.6	5.65	1	26.2	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
105.31	5.0E-08	-0.03	12.8	5.75	1	24.8	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDe
105.48	5.0E-07	-0.03	12.0	5.02	1	23.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
105.64	5.0E-06	-0.03	11.4	4.70	1	22.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
105.81	5.0E-08	-0.04	9.3	5.66	1	19.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
105.97	5.0E-07	-0.04	9.6	5.28	1	19.5	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
106.13	5.0E-08	-0.04	8.5	6.00	1	17.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
106.30	5.0E-08	-0.04	9.5	5.59	1	19.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
106.46	5.0E-08	-0.04	9.5	6.08	1	19.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
106.63	5.0E-07	-0.03	10.8	5.54	1	21.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
106.79	5.0E-07	-0.04	10.4	5.23	1	20.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
106.95	5.0E-07	-0.04	9.4	5.40	1	19.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
107.12	5.0E-08	-0.04	9.0	5.66	1	18.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
107.28	5.0E-08	-0.04	8.4	6.30	1	17.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
107.45	5.0E-08	-0.04	9.4	6.05	1	19.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
107.61	5.0E-08	-0.03	10.0	5.78	1	20.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
107.77	5.0E-07	-0.03	11.1	5.14	1	22.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
107.94	5.0E-06	-0.03	10.8	4.88	1	21.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
108.10	5.0E-08	-0.03	9.1	5.72	1	18.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
108.27	5.0E-07	-0.03	9.3	5.29	1	19.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
108.43	5.0E-08	-0.04	7.8	6.12	1	16.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
108.59	5.0E-06	-0.03	8.9	4.58	1	18.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
108.76	5.0E-07	-0.04	7.8	5.31	1	16.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
108.92	5.0E-07	-0.04	8.3	5.47	1	17.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
109.09	5.0E-06	-0.03	10.4	4.79	1	21.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
109.25	5.0E-07	-0.03	9.3	5.56	1	19.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
109.41	5.0E-08	-0.03	8.1	5.61	1	17.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
109.58	5.0E-07	-0.04	7.6	5.42	1	16.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
109.74	5.0E-07	-0.04	7.3	5.50	1	15.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
109.91	5.0E-07	-0.03	8.4	5.43	1	17.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
110.07	5.0E-07	-0.03	8.7	5.58	1	18.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
110.23	5.0E-08	-0.03	8.6	6.06	1	18.1	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
110.40	5.0E-06	-0.03	9.4	4.31	1	19.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
110.56	5.0E-06	-0.03	10.0	4.26	1	20.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDe
110.73	5.0E-05	0.00	12.9	3.29	4	25.6	102.3	127.8	53.9	32	30.0	6.0	-0.09	10.0	20.

APPENDIX D

Ninyo & Moore

APPENDIX D

CORRESPONDENCE

November 30, 2005
Project No. 103645001

Mr. Edgar A. Camerino, P.E.
Rick Engineering Company
5620 Friars Road
San Diego, California 92110-2596

Subject: Update Letter for Draft Geotechnical Report
El Camino Real Roadway Widening
San Diego, California

References: "Draft Geotechnical Report, El Camino Real Roadway Widening, San Diego, California," prepared by Ninyo & Moore, dated August 19, 1998.

Dear Mr. Camerino:

In accordance with your request, we are submitting this update letter for the referenced draft geotechnical report on the subject roadway widening project. Based on our communication with you and Ms. Katherine Hon, P.E., of Hon Consulting, Inc., it is our opinion that the conclusions and recommendations presented in the referenced draft report are still valid for the proposed improvements.

We appreciate the opportunity to be of service on this project. If you have questions regarding this submittal, please contact the undersigned.

Respectfully submitted,
NINYO & MOORE

Erik Olsen, G.E.
Chief Geotechnical Engineer

REGISTERED PROFESSIONAL ENGINEER
ERIK OLSEN
No. 2213
Exp. 3/31/06
GEOTECHNICAL
STATE OF CALIFORNIA

Randal L. Irwin, C.E.G.
Chief Engineering Geologist

REGISTERED GEOLOGIST
Randal L. Irwin
No. 1521
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Engineering
Geologist
Exp. 9/30/07
STATE OF CALIFORNIA

TQ/EO/RI/yye

Distribution: (10) Addressee

December 4, 2012
Project No. 107179004

Mr. Dean Marsden
City of San Diego
Engineering and Capital Projects Department
600 B Street, Suite 800
San Diego, California 92101

Subject: Geotechnical Update
El Camino Real Bridge and Road Widening Project
San Diego, California

Dear Mr. Marsden:

In accordance with your request, we are providing this geotechnical update for the El Camino Real Bridge/Road Widening project. We understand that the project will include the widening of El Camino Real including the existing bridge over the San Dieguito River to a four-lane major road. While multiple alternatives are under consideration for the project design, we understand that the alternatives include reconstruction of the widened roadway and bridge above the 100-year flood level and cast-in-place concrete pile foundations for the new bridge.

Conditions of the referenced reports (Ninyo & Moore, 2005 and 2006) addressing project alternatives remain valid unless specifically superseded herein. We recommend additional subsurface exploration be conducted to provide geotechnical design criteria upon selection of a project design alternative.

Our scope of services for this project included the following:

- Reviewing Ninyo & Moore's geologic and geotechnical reporting for this project (Ninyo & Moore, 1998a, 1998b, 2005, and 2006) and update as appropriate by:
  - Reviewing readily available geologic and geotechnical data that postdates our previous reporting. This data includes geologic maps, earthquake fault maps, seismic hazard maps, published geologic literature, and reports and/or plans provided by the client.
  - Reviewing readily available groundwater data that postdates out previous reporting. This data includes published regional groundwater maps and review of monitoring well data.

- Performing a site reconnaissance to observe existing site conditions.
- Compile and analyze newly acquired and existing data regarding site subsurface conditions and potential geologic and geotechnical impacts/constraints to the project.
- Preparing this update letter report presenting the results of our data review and reconnaissance activities.

SITE RECONNAISSANCE

We performed a geologic site reconnaissance of the project area on November 19, 2012. Based on observations made during our site reconnaissance and review of the previous geotechnical report for the site, the conditions are similar to those noted in our geotechnical report (Ninyo & Moore, 2006) for the project.

FAULTING AND SEISMICITY

Based on our review of the referenced geologic maps and stereoscopic aerial photographs, as well as on our geologic field mapping, the subject site is not underlain by known active or potentially active faults (i.e., faults that exhibit evidence of ground displacement in the last 11,000 years and 2,000,000 years, respectively). However, the site is located in a seismically active area, as is the majority of southern California, and the potential for strong ground motion is considered significant during the design life of the proposed structure. Table 1 lists selected principal known active faults that may affect the subject site and the maximum moment magnitudes (M_{max}) as published for the California Geological Survey (CGS) by Cao et al. (2003). The approximate fault-to-site distances were calculated using the computer program FRISKSP (Version 4.00) developed by Blake (2001).

Table 1 – Principal Active Faults

Fault	Distance miles (kilometers) [1,2]	Moment Magnitude[2]
Rose Canyon	4.4 (7.1)	7.2
Newport-Inglewood (Offshore)	17 (21)	7.1
Coronado Bank	18 (29)	7.6
Elsinore (Julian Segment)	30 (48)	7.1
Elsinore (Temecula Segment)	30 (49)	6.8
Notes: [1] Blake (2001); [2] Cao, et al. (2003)		

The most significant seismic event likely to affect the proposed project would be a moment magnitude 7.2 earthquake within the Rose Canyon fault zone located approximately 4.4 miles west of the project site.

CITY OF SAN DIEGO SEISMIC SAFETY STUDY

According to the City of San Diego Seismic Safety Study (2008), the project area is mapped in Hazard Zone 32. Hazard Zone 32 designates areas with fluctuating groundwater within minor drainages where the potential for liquefaction is low. Hazard Zone 31, characterized as areas with shallow groundwater, major drainages, and hydraulic fills where the potential for liquefaction is high, is mapped approximately 300 feet west of the existing bridge.

We appreciate the opportunity to be of service on this project.

Sincerely,
NINYO & MOORE

Ronald D. Hallum, PG, CEG
Senior Geologist

Emil Rudolph, PE, GE
Principal Engineer

Gregory T. Farrand, CEG
Principal Geologist

NMM/RDH/ER/GTF/gg

Attachment: References

Distribution: (1) Addressee

REFERENCES

California Building Standards Commission (CBSC), 2010, California Building Code (CBC), Title 24, Part 2, Volumes 1 and 2.

Cao, T., Bryant, W. A., Rowshandel, B., Branum, D., and Willis, C. J., 2003, The Revised 2002 California Probabilistic Seismic Hazards Maps: California Geological Survey: dated June City of San Diego, 2008, Seismic Safety Study, Geologic Hazards and Faults.

GeoTracker, 2012, California Environmental Database, http://geotracker.waterboards.ca.gov/.

Jennings, C.W., 2010, Fault Activity Map of California and Adjacent Areas: California Geological Survey, California Geological Map Series, Map No. 6.

Kennedy, M.P., and Tan, S.S., 2008, Geologic Map of the San Diego 30'x 60' Quadrangle, California; California Geological Survey, Regional Geologic Map Series.

Ninyo & Moore, 1998a, Draft Foundation Report, El Camino Real Bridge Widening, San Diego, California: dated August 14.

Ninyo & Moore, 1998b, Draft Geotechnical Report, El Camino Real Road Widening, San Diego, California: dated August 19.

Ninyo & Moore, 2005, Revised Geotechnical Report, El Camino Real/San Dieguito River Bridge Project, San Diego, California: revised June 17.

Ninyo & Moore, 2006, Final Geotechnical Report, El Camino Real Roadway Widening, San Diego, California: revised January 23, 2006.

United States Federal Emergency Management Agency (FEMA), 2012, Flood Insurance Rate Map (FIRM), No. 06073C1326 G: dated May 16.

The EDR Area Study Report

Study Area
El Camino
Del Mar, CA 92014

May 22, 2003

Inquiry number 0981322.1s

Environmental Data Resources, Inc.

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06890

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR).

TARGET PROPERTY INFORMATION

ADDRESS

EL CAMINO
DEL MAR, CA 92014

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records within the requested search area for the following databases:

FEDERAL ASTM STANDARD

NPL	National Priority List
Proposed NPL	Proposed National Priority List Sites
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP	CERCLIS No Further Remedial Action Planned
CORRACTS	Corrective Action Report
RCRIS-TSD	Resource Conservation and Recovery Information System
RCRIS-LQG	Resource Conservation and Recovery Information System
ERNS	Emergency Response Notification System

STATE ASTM STANDARD

AWP	Annual Workplan Sites
Cal-Sites	Calsites Database
Notify 65	Proposition 65 Records
Toxic Pits	Toxic Pits Cleanup Act Sites
SWF/LF	Solid Waste Information System
WMUDS/SWAT	Waste Management Unit Database
CA BOND EXP. PLAN	Bond Expenditure Plan
UST	List of Underground Storage Tank Facilities
VCP	Voluntary Cleanup Program Properties
INDIAN UST	Underground Storage Tanks on Indian Land
CA FID UST	Facility Inventory Database
HIST UST	Hazardous Substance Storage Container Database

FEDERAL ASTM SUPPLEMENTAL

CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
Delisted NPL	National Priority List Deletions

HMIRS	Hazardous Materials Information Reporting System
MLTS	Material Licensing Tracking System
MINES	Mines Master Index File
NPL Liens	Federal Superfund Liens
PADS	PCB Activity Database System
DOD	Department of Defense Sites
RAATS	RCRA Administrative Action Tracking System
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
SSTS	Section 7 Tracking Systems
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

AST	Aboveground Petroleum Storage Tank Facilities
CA WDS	Waste Discharge System
DEED	List of Deed Restrictions
NFA	No Further Action Determination
REF	Unconfirmed Properties Referred to Another Agency
SCH	School Property Evaluation Program
NFE	Properties Needing Further Evaluation
CA SLIC	Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas	Former Manufactured Gas (Coal Gas) Sites

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL ASTM STANDARD

RCRIS: The Resource Conservation and Recovery Act database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act. The source of this database is the U.S. EPA.

A review of the RCRIS-SQG list, as provided by EDR, and dated 09/09/2002 has revealed that there is 1 RCRIS-SQG site within the searched area.

Site	Address	Map ID	Page
SILVER HANGER DRY CLEANERS	***3790 VIA DE LA VALLE ST***	***5***	***8***

EXECUTIVE SUMMARY

STATE ASTM STANDARD

CHMIRS: The California Hazardous Material Incident Report System contains information on reported hazardous material incidents, i.e., accidental releases or spills. The source is the California Office of Emergency Services.

A review of the CHMIRS list, as provided by EDR, and dated 12/31/2001 has revealed that there is 1 CHMIRS site within the searched area.

Site	Address	Map ID	Page
Not reported	3790 VIA DE LA VALLE SU	2	5

CORTESE: This database identifies public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with USTs having a reportable release and all solid waste disposal facilities from which there is known migration. The source is the California Environmental Protection Agency/Office of Emergency Information.

A review of the Cortese list, as provided by EDR, has revealed that there is 1 Cortese site within the searched area.

Site	Address	Map ID	Page
DAVID PLANK ESTATE	*14905 EL CAMINO REAL*	*1*	*3*

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, and dated 04/02/2003 has revealed that there is 1 LUST site within the searched area.

Site	Address	Map ID	Page
DAVID PLANK ESTATE	*14905 EL CAMINO REAL*	*1*	*3*

FEDERAL ASTM SUPPLEMENTAL

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 01/14/2003 has revealed that there is 1 FINDS site within the searched area.

Site	Address	Map ID	Page
SILVER HANGER DRY CLEANERS	*3790 VIA DE LA VALLE ST*	*5*	*8*

STATE OR LOCAL ASTM SUPPLEMENTAL

DRYCLEANERS:A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaners' agents; linen supply; coin-operated laundries and cleaning; drycleaning plants except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

A review of the CLEANERS list, as provided by EDR, and dated 03/18/2002 has revealed that there is 1 CLEANERS site within the searched area.

Site	Address	Map ID	Page
SILVER HANGER DRY CLEANERS	*3790 VIA DE LA VALLE ST*	*5*	*8*

HAZNET: The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually, representing approximately 350,000-500,000 shipments. Data from non-California manifests & continuation sheets are not included at the present time. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, & disposal method. The source is the Department of Toxic Substance Control is the agency

A review of the HAZNET list, as provided by EDR, has revealed that there are 3 HAZNET sites within the searched area.

Site	Address	Map ID	Page
DAVID PLANK ESTATE	*14905 EL CAMINO REAL*	*1*	*3*
MORGAN RUN RESORT	4000 VIA DE LA VALLE	3	6
ALL CREATURES ANIMAL HOSPITAL	*3665 VIA DE LA VALLE*	*6*	*10*

Hazardous Materials Management Division Database: The Hazardous Materials Management Division Database comes from the Hazardous Materials Management Division.

A review of the SAN DIEGO CO. HMMD list, as provided by EDR, has revealed that there are 4 SAN DIEGO CO. HMMD sites within the searched area.

Site	Address	Map ID	Page
DAVID PLANK ESTATE	*14905 EL CAMINO REAL*	*1*	*3*
CASA PALMERA CARE CENTER	14750 EL CAMINO REAL	4	6
SILVER HANGER DRY CLEANERS	*3790 VIA DE LA VALLE ST*	*5*	*8*
ALL CREATURES ANIMAL HOSPITAL	*3665 VIA DE LA VALLE*	*6*	*10*

EXECUTIVE SUMMARY

Please refer to the end of the findings report for unmapped orphan sites due to poor or inadequate address information.

MAP FINDINGS SUMMARY

Database	Total Plotted
FEDERAL ASTM STANDARD	
NPL	0
Proposed NPL	0
CERCLIS	0
CERC-NFRAP	0
CORRACTS	0
RCRIS-TSD	0
RCRIS Lg. Quan. Gen.	0
RCRIS Sm. Quan. Gen.	1
ERNS	0
STATE ASTM STANDARD	
AWP	0
Cal-Sites	0
CHMIRS	1
Cortese	1
Notify 65	0
Toxic Pits	0
State Landfill	0
WMUDS/SWAT	0
LUST	1
CA Bond Exp. Plan	0
UST	0
VCP	0
INDIAN UST	0
CA FID UST	0
HIST UST	0
FEDERAL ASTM SUPPLEMENTAL	
CONSENT	0
ROD	0
Delisted NPL	0
FINDS	1
HMIRS	0
MLTS	0
MINES	0
NPL Liens	0
PADS	0
DOD	0
RAATS	0
TRIS	0
TSCA	0
SSTS	0
FTTS	0
STATE OR LOCAL ASTM SUPPLEMENTAL	
AST	0

Database	Total Plotted
CLEANERS	1
CA WDS	0
DEED	0
NFA	0
REF	0
SCH	0
NFE	0
CA SLIC	0
HAZNET	3
San Diego Co. HMMD	4

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas	0

NOTES:

Sites may be listed in more than one database

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

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1 **DAVID PLANK ESTATE**
14905 EL CAMINO REAL
DEL MAR, CA 92067

HAZNET **S101579576**
LUST **N/A**
Cortese
SAN DIEGO CO. HMMD

LUST Region 9:

Case Number:	9UT3448	Release Date:	08/29/1995
Local Agency:	37000		
Substance:	12034	Qty Leaked:	0
Date Found:	08/29/1995	How Found:	Not reported
Date Stopped:	08/29/1995	How Stopped:	Not reported
Source:	Tank	Cause:	Corrosion
Lead Agency:	Local Agency		
Status:	Case Closed		
Case Type:	Soil only		
Abate Method:	Excavate and Dispose - remove contaminated soil and dispose in approved site, Cap Site - install horizontal impermeable layer to reduce rainfall infiltration		
Confirm Date:	Not reported	Submit Workplan:	Not reported
Prelim Assess:	Not reported	Desc Pollution:	Not reported
Remed Plan:	Not reported	Remed Action:	Not reported
Began Monitor:	1/28/97	Closed Date:	1/28/97
Enforce Type:	Not reported		
Enforce Date:	Not reported		
Pilot Program:	LOP	Local Case:	H32367-001
Basin Number:	905.11	Gwater Depth:	51'
File Dispn:	Administratively opened on database, however no file physically exists		

Interim Remedial Actions:	Not reported
Beneficial Use:	BU
Cleanup and Abatement order Number:	Not reported
Waste Discharge Requirement Number:	Not reported
NPDES Number:	Not reported

HAZNET:

Gepaid:	CAC001053872
Tepaid:	CAD028409019
Gen County:	San Diego
Tsd County:	Los Angeles
Tons:	.6672
Category:	Hydrocarbon solvents (benzene, hexane, Stoddard, etc.)
Disposal Method:	Treatment, Tank
Contact:	DAVID PLANK
Telephone:	(000) 000-0000
Mailing Address:	14905 EL CAMINO REAL RANCHO SANTA FE, CA 92067
County	San Diego

CORTESE:

Reg Id:	9UT3448
Region:	CORTESE
Reg By:	Leaking Underground Storage Tanks

HMMD:

Facility ID:	H32367		
Inactive Indicator:	Inactive	Business Code:	Not reported
SIC:	Not reported	Permit Expiration:	08/31
Owner:	DAVID PLANK	2nd Name:	Not reported

DAVID PLANK ESTATE (Continued) **S101579576**

Mailing Address: SAN ANTONIO
TX
78251
Corporate Code: Not reported
Census Tract #: Not reported
Inspection Date: Not reported
Inspector Name: Not reported
Facility Contact: DAVID PLANK
Property Owner: Not reported
PO Address: Not reported
Tank Owner: Not reported
TO Address: Not reported
Last Update: 08/05/1998 0:00:00
Fire Dept District: RANCHO SANTA FE FPD
EPA ID: Not reported
Reinspection Date: Not reported
Gas Station: Not reported
Delinquent Flag: Not Delinquent
Last Delinquent Letter: 10/07/1997 0:00:00
Last Letter Type: 30
Violation Notice Issued: Not reported
Map Code/Business Plan on File: Not reported
Business Plan Acceptance Date: Not reported
Reinspection Date Y2K Compatible: Not reported

HMMD DISCLOSURE INVENTORY:
Chemical Name: Not reported
Item Number: Not reported
Stored at 1 Time: Not reported
Measurement UnitsNot reported
Carcinogen: No
Storage Method: Not reported
Annual Qty String: Not reported
Quantity Stored At One Time: Not reported
Annual Quantity String: Not reported
Material Safety Data Sheet: Not reported
1st Hazard Category: Not reported
2nd Hazard Category: Not reported

HMMD UNDERGROUND TANKS:
Tank Number: T001
Capacity (Gal): 8000.00
Waste or Product: Product
Tank ID Number: AT3499
Tank Exempt: No
Tank Contents: DIESEL

HMMD WASTE STREAMS:
Inspection Date: Not reported
Waste Code: Not reported
Qnty at Inspection: Not reported
Measurement Unit: Not reported
Treatment Method: Not reported
Waste Description: Not reported
Carcinogen: No
Quantity String: Not reported
Waste Item #: Not reported
Waste Name: Not reported
Annual Quantity: Not reported
Storage Method: Not reported
Haz Waste Hauler: Not reported
Annual Qty String: Not reported

HMMD VIOLATIONS:
Inspection Date: Not reported
Waste Code: Not reported
Type of Violation: Not reported
Violation Description:
Occurrences: Not reported

HMMD ENVIRONMENTAL ASSESSMENT INFORMATION:
Case Status Date: 01/28/1997 0:00:00
Case Type: TANK, RELEASE
Case Status: CLOSED
Release Occurrence Number: 001
Historical Name: DAVID PLANK ESTATE
Date Release Began: 08/29/1995 0:00:00

DAVID PLANK ESTATE (Continued) **S101579576**

Lead Agency: DEH

The CA HMMD database may contain additional details for this site.
Please contact your EDR Account Executive for more information.

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2 **CHMIRS** **S100276586**

3790 VIA DE LA VALLE SUIT 213 **N/A**
RANCHO SANTE FE, CA 92067

CHMIRS:

OES Control Number:	9100106	DOT ID:	1270
DOT Hazard Class:	Flammable liquid		
Chemical Name:	MOTOR OIL		
Extent of Release:	Not reported		
CAS Number:	Not reported	Quantity Released:	2
Environmental Contamination:	Ground	Property Use:	Mercantile, Business
Incident Date:	02-FEB-91	Date Completed:	02-FEB-91

Time Completed :	1143
Physical State Stored :	Liquid
Physical State Released :	Liquid
Release Unit :	Gallons
Container Description :	3
Container Type :	09
Container Material :	Iron Steel and Other Iron Alloys
Level Of Container :	Ground Level
Container Capacity :	2
Container Capacity Units (code) :	Gallons
Extent Of Release (code) :	6
Agency Id Number :	37135
Agency Incident Number :	1832
OES Incident Number :	9100106
Time Notified :	1031
Surrounding Area :	500
Estimated Temperature :	68
Property Management :	P
More Than Two Substances Involved? :	Not reported
Special Studies 1 :	Not reported
Special Studies 2 :	Not reported
Special Studies 3 :	Not reported
Special Studies 4 :	Not reported
Special Studies 5 :	Not reported
Special Studies 6 :	Not reported
Responding Agency Personel # Of Injuries :	0
Responding Agency Personel # Of Fatalities :	0
Resp Agncy Personel # Of Decontaminated :	0
Others Number Of Decontaminated :	0
Others Number Of Injuries :	0
Others Number Of Fatalities :	0
Vehicle Make/year :	MERCEDES 405SE
Vehicle License Number :	5883 KPP
Vehicle State :	CA
Vehicle Id Number :	Not reported
CA/DOT/PUC/ICC Number :	Not reported
Company Name :	Not reported
Reporting Officer Name/ID :	WILLIAM LUTZ
Report Date :	02-FEB-91
Comments :	Yes
Facility Telephone Number :	619 756-5971
Waterway Involved :	Not reported

Map ID Direction Distance Distance (ft.)	Site	Database(s)	EDR ID Number EPA ID Number

(Continued) **S100276586**

Waterway :	Not reported
Spill Site :	Not reported
Cleanup By :	Not reported
Containment :	Not reported
What Happened :	Not reported
Date/Time :	Not reported
Evacuations :	Not reported
Type :	Not reported
Other :	Not reported
Chemical 1 :	Not Reported
Chemical 2 :	Not Reported
Chemical 3 :	Not Reported

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3 **MORGAN RUN RESORT** **HAZNET** **S104575416**
4000 VIA DE LA VALLE **N/A**
RANCHO SANTA FE, CA 92091

HAZNET:

Gepaid:	CAL000009380
Tepaid:	CAT080013352
Gen County:	San Diego
Tsd County:	Los Angeles
Tons:	.6255
Category:	Unspecified oil-containing waste
Disposal Method:	Recycler
Contact:	WHISPERING PALMS
Telephone:	(000) 000-0000
Mailing Address:	5690 CANCHA DE GOLF RANCHO SANTA FE, CA 92091 - 3209
County	San Diego

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4 **CASA PALMERA CARE CENTER** **SAN DIEGO CO. HMMD** **S104751875**
14750 EL CAMINO REAL **N/A**
DEL MAR, CA 92014

HMMD:

Facility ID:	H29009		
Inactive Indicator:	Active	Business Code:	MEDICAL/HEALTH-RELATED
SIC:	8059	Permit Expiration:	06/30
Owner:	LEE JOHNSON	2nd Name:	Not reported
Mailing Address:	DEL MAR CA 92014, 9616		
Corporate Code:	20	Fire Dept District:	Not reported
Census Tract #:	17106	EPA ID:	Not reported
Inspection Date:	02/22/2002 0:00:00	Reinspection Date:	02/03
Inspector Name:	MANN	Gas Station:	Not reported
Facility Contact:	ROBERTO ENRIQUEZ	Delinquent Flag:	Not Delinquent
Property Owner:	Not reported		
PO Address:	Not reported		
Tank Owner:	Not reported		
TO Address:	Not reported		
Last Update:	03/29/2002 0:00:00		

Last Delinquent Letter:	Not reported
Last Letter Type:	Not reported
Violation Notice Issued:	Not reported
Map Code/Business Plan on File:	Not reported
Business Plan Acceptance Date:	06/04/97

CASA PALMERA CARE CENTER (Continued) **S104751875**

Reinspection Date Y2K Compatible: Feb 2003

HMMD DISCLOSURE INVENTORY:
Chemical Name: DIESEL FUEL OIL #2
Item Number: D001
Stored at 1 Time: 150.00
Measurement Units:0000000300
Storage Method: Not reported
Carcinogen: Yes
Annual Qty String: 0000000150
Quantity Stored At One Time: 684-76-346
Annual Quantity String: 300.00
Material Safety Data Sheet: A
1st Hazard Category: Not reported
2nd Hazard Category: IMMED HEALTH HAZRD

Chemical Name: OXYGEN, O2, COMPRESSED GAS:
Item Number: D002
Stored at 1 Time: 1306.00
Measurement Units:0000001806
Storage Method: Not reported
Carcinogen: Yes
Annual Qty String: 0000001306
Quantity Stored At One Time: 7782-44-7
Annual Quantity String: 1806.00
Material Safety Data Sheet: C
1st Hazard Category: Not reported
2nd Hazard Category: FIRE HAZARD

HMMD UNDERGROUND TANKS:
Tank Number: Not reported
Tank ID Number: Not reported
Capacity (Gal): Not reported
Tank Exempt: Not reported
Waste or Product: Not reported
Tank Contents: Not reported

HMMD WASTE STREAMS:
Inspection Date: 02/22/2002 0:00:00
Waste Item #: W001
Waste Code: 901.00
Waste Name: INFECTIOUS WASTE, GENERAL
Qnty at Inspection: 1.00
Annual Quantity: 12.00
Measurement Unit: LBS
Treatment Method: AUTOCLAVE
Storage Method: BAGS: BRLAP,CLOTH,PAPER,PLSTIC
Waste Description: GENERAL INFECTIOUS WASTE
Haz Waste Hauler: STERICYCLE, INC
Carcinogen: No
Annual Qty String: 0000000012
Quantity String: 0000000001

Inspection Date: 02/22/2002 0:00:00
Waste Item #: W002
Waste Code: 902.00
Waste Name: INFECTIOUS WASTE, SHARPS
Qnty at Inspection: 10.00
Annual Quantity: 120.00
Measurement Unit: LBS
Treatment Method: AUTOCLAVE
Storage Method: FIBER/PLSTIC BOXES,CRTNS,CASES
Waste Description: SHARPS
Haz Waste Hauler: STERICYCLE, INC
Carcinogen: No
Annual Qty String: 0000000120
Quantity String: 0000000010

HMMD VIOLATIONS:
Inspection Date: 02/22/2002 0:00:00
Occurrences: 02
Waste Code: Not reported
Type of Violation: GENERAL VIOLATION
Violation Description: HAZARDOUS MATERIALS HAVE NOT BEEN ADEQUATELY LABELED WITHIN 10 DAYS AND ARE NOW DECLARED HAZARDOUS WASTE
HSC 25124(E)

Inspection Date: 02/22/2002 0:00:00
Occurrences: 01
Waste Code: Not reported

CASA PALMERA CARE CENTER (Continued) **S104751875**

Type of Violation: GENERAL VIOLATION
Violation Description: DID NOT PLACE A LABEL WITH THE GENERATOR'S NAME, ADDRESS, & PHONE NUM. ON THE OUTSIDE OF THE RED BAG AND/OR SHARPS CONT. 68.1201 & 68.1205

Inspection Date: 02/22/2002 0:00:00 Occurrences: 01
Waste Code: Not reported
Type of Violation: GENERAL VIOLATION
Violation Description: GENERATOR DID NOT RETAIN ON FILE DISPOSAL RECEIPTS AND/OR TRACKING DOCUMENTS FOR WASTE SHIPPED OFFSITE FOR AT LEAST 2 YEARS. 117945

Inspection Date: 06/22/1998 0:00:00 Occurrences: 01
Waste Code: Not reported
Type of Violation: GENERAL VIOLATION
Violation Description: HAZARDOUS MATERIALS HAVE NOT BEEN ADEQUATELY LABELED WITHIN 10 DAYS AND ARE NOW DECLARED HAZARDOUS WASTE HSC 25124(E)

HMMD ENVIRONMENTAL ASSESSMENT INFORMATION:
Case Status Date: Not reported
Case Type: Not reported
Case Status: Not reported
Release Occurrence Number: Not reported
Historical Name: Not reported
Date Release Began: Not reported
Lead Agency: Not reported

The CA HMMD database may contain additional details for this site.
Please contact your EDR Account Executive for more information.

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5 **SILVER HANGER DRY CLEANERS** **RCRIS-SQG** **1000430752**
3790 VIA DE LA VALLE STE 216 **FINDS** **CAD982048811**
DEL MAR, CA 92014 **SAN DIEGO CO. HMMD**
CLEANERS

RCRIS:
Owner: BERNARD COOPER
(415) 555-1212
EPA ID: CAD982048811

Contact: ENVIRONMENTAL MANAGER
(619) 792-1111

Classification: Small Quantity Generator
Used Oil Recyc: No
TSDF Activities: Not reported

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
Facility Registry System (FRS)
Resource Conservation and Recovery Act Information system (RCRAINFO)

CA Cleaners:
Create Date: 03/01/1988
Inactive Date: 06/30/1995
EPA Id: CAD982048811
County : San Diego

SILVER HANGER DRY CLEANERS (Continued) **1000430752**

HMMD:

Facility ID:	H28519		
Inactive Indicator:	Inactive	Business Code:	Not reported
SIC:	Not reported	Permit Expiration:	01/31
Owner:	BERNARD COOPER	2nd Name:	Not reported
Mailing Address:	DEL MAR CA 92014, 9601		
Corporate Code:	97	Fire Dept District:	RANCHITA-MONTEZUMA VALLEY
Census Tract #:	17302	EPA ID:	Not reported
Inspection Date:	Not reported	Reinspection Date:	Not reported
Inspector Name:	Not reported	Gas Station:	Not reported
Facility Contact:	BERNARD COOPER	Delinquent Flag:	Not Delinquent
Property Owner:	Not reported		
PO Address:	Not reported		
Tank Owner:	Not reported		
TO Address:	Not reported		
Last Update:	10/03/1999 0:00:00		
Last Delinquent Letter:	Not reported		
Last Letter Type:	Not reported		
Violation Notice Issued:	Not reported		
Map Code/Business Plan on File:	Not reported		
Business Plan Acceptance Date:	Not reported		
Reinspection Date Y2K Compatible:	Not reported		

HMMD DISCLOSURE INVENTORY:

Chemical Name:	Not reported		
Item Number:	Not reported		
Stored at 1 Time:	Not reported		
Measurement Units	Not reported	Storage Method:	Not reported
Carcinogen:	No	Annual Qty String:	Not reported
Quantity Stored At One Time:	Not reported		
Annual Quantity String:	Not reported		
Material Safety Data Sheet:	Not reported		
1st Hazard Category:	Not reported		
2nd Hazard Category:	Not reported		

HMMD UNDERGROUND TANKS:

Tank Number:	Not reported	Tank ID Number:	Not reported
Capacity (Gal):	Not reported	Tank Exempt:	Not reported
Waste or Product:	Not reported	Tank Contents:	Not reported

HMMD WASTE STREAMS:

Inspection Date:	Not reported	Waste Item #:	Not reported
Waste Code:	Not reported	Waste Name:	Not reported
Qnty at Inspection:	Not reported	Annual Quantity:	Not reported
Measurement Unit:	Not reported		
Treatment Method:	Not reported	Storage Method:	Not reported
Waste Description:	Not reported	Haz Waste Hauler:	Not reported
Carcinogen:	No	Annual Qty String:	Not reported
Quantity String:	Not reported		

HMMD VIOLATIONS:

Inspection Date:	Not reported	Occurrences:	Not reported
Waste Code:	Not reported		
Type of Violation:	Not reported		
Violation Description:			

HMMD ENVIRONMENTAL ASSESSMENT INFORMATION:

SILVER HANGER DRY CLEANERS (Continued) **1000430752**

Case Status Date: Not reported
Case Type: Not reported
Case Status: Not reported
Release Occurrence Number: Not reported
Historical Name: Not reported
Date Release Began: Not reported
Lead Agency: Not reported

The CA HMMD database may contain additional details for this site.
Please contact your EDR Account Executive for more information.

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6 **ALL CREATURES ANIMAL HOSPITAL** **HAZNET** **S103949391**
3665 VIA DE LA VALLE **SAN DIEGO CO. HMMD** **N/A**
DEL MAR, CA 92014

HAZNET:
Gepaid: CAL000089689
Tepaid: CAD981402522
Gen County: San Diego
Tsd County: Kern
Tons: .0166
Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: MICHAEL MULVANY DVM
Telephone: (619) 481-7992
Mailing Address: 3665 VIA DE LA VALLE
DEL MAR, CA 92014
County San Diego

HMMD:
Facility ID: H50079
Inactive Indicator: Active
SIC: 8900
Owner: MICHAEL MULVANEY
Mailing Address: DEL MAR
CA
92014, 9713
Business Code: SMALL QTY MED WASTE GEN
Permit Expiration: 06/30
2nd Name: Not reported
Corporate Code: Not reported
Census Tract #: Not reported
Inspection Date: 08/29/2001 0:00:00
Inspector Name: FRIEDMAN
Facility Contact: JEAN HAMILTON
Fire Dept District: DEL MAR FD
EPA ID: Not reported
Reinspection Date: 08/04
Gas Station: Not reported
Delinquent Flag: Not Delinquent
Property Owner: Not reported
PO Address: Not reported
Tank Owner: Not reported
TO Address: Not reported
Last Update: 11/25/2001 0:00:00
Last Delinquent Letter: 01/07/1998 0:00:00
Last Letter Type: 60
Violation Notice Issued: Not reported
Map Code/Business Plan on File: Not reported
Business Plan Acceptance Date: Not reported
Reinspection Date Y2K Compatible: Aug 2004

HMMD DISCLOSURE INVENTORY:
Chemical Name: Not reported
Item Number: Not reported
Stored at 1 Time: Not reported
Measurement UnitsNot reported
Carcinogen: No
Storage Method: Not reported
Annual Qty String: Not reported

ALL CREATURES ANIMAL HOSPITAL (Continued) **S103949391**

Quantity Stored At One Time: Not reported
Annual Quantity String: Not reported
Material Safety Data Sheet: Not reported
1st Hazard Category: Not reported
2nd Hazard Category: Not reported

HMMD UNDERGROUND TANKS:
Tank Number: Not reported
Capacity (Gal): Not reported
Waste or Product: Not reported
Tank ID Number: Not reported
Tank Exempt: Not reported
Tank Contents: Not reported

HMMD WASTE STREAMS:
Inspection Date: 08/29/2001 0:00:00
Waste Code: 901.00
Qnty at Inspection: 80.00
Measurement Unit: LBS
Treatment Method: AUTOCLAVE
Waste Description: GEN. INFECTIOUS WASTE
Carcinogen: No
Quantity String: 0000000080
Waste Item #: W001
Waste Name: INFECTIOUS WASTE, GENERAL
Annual Quantity: 800.00
Storage Method: BAGS: BRLAP,CLOTH,PAPER,PLSTIC
Haz Waste Hauler: BFI MEDICAL WASTE SYSTEMS
Annual Qty String: 0000000800

Inspection Date: 08/29/2001 0:00:00
Waste Code: 901.00
Qnty at Inspection: 75.00
Measurement Unit: LBS
Treatment Method: AUTOCLAVE
Waste Description: SHARPS
Carcinogen: No
Quantity String: 0000000075
Waste Item #: W002
Waste Name: INFECTIOUS WASTE, GENERAL
Annual Quantity: 800.00
Storage Method: FIBER/PLSTIC BOXES,CRTNS,CASES
Haz Waste Hauler: BFI MEDICAL WASTE SYSTEMS
Annual Qty String: 0000000800

Inspection Date: 08/29/2001 0:00:00
Waste Code: 541.00
Qnty at Inspection: 5.00
Measurement Unit: LBS
Treatment Method: RECYCLE
Waste Description: X-RAY FIXER WASTE
Carcinogen: No
Quantity String: 0000000005
Waste Item #: W003
Waste Name: PHOTOCHEM/PHOTOPROC WASTE
Annual Quantity: 48.00
Storage Method: PROCESSING EQUIPMENT
Haz Waste Hauler: COMMODITY RESOURCE AND EN
Annual Qty String: 0000000048

HMMD VIOLATIONS:
Inspection Date: 11/22/1995 0:00:00
Occurrences: 01
Waste Code: Not reported
Type of Violation: GENERAL VIOLATION
Violation Description: PERS. TRAINING IN THE HANDLING AND DISPOSAL OF MED. WST. (BIOHAZ) IS NOTADEQUATE OR PROP. DOCUMENTED. (SDCC 68.1201 (H); 1206, HSC25045; 42; 52)

HMMD ENVIRONMENTAL ASSESSMENT INFORMATION:
Case Status Date: Not reported
Case Type: Not reported
Case Status: Not reported
Release Occurrence Number: Not reported
Historical Name: Not reported
Date Release Began: Not reported
Lead Agency: Not reported

The CA HMMD database may contain additional details for this site.
Please contact your EDR Account Executive for more information.

ALL CREATURES ANIMAL HOSPITAL (Continued) **S103949391**

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
DEL MAR	S105690930	CHEVRON #8561	941 CAMINO DEL MAR	92014	LUST
DEL MAR	S105691003	CHEVRON #9-8561	941 CAMINO DEL MAR	92014	LUST
DEL MAR	S105692667	CHEVRON USA	941 CAMINO DEL MAR	92014	LUST
DEL MAR	S102066306	DEL MAR DUMP	NEAR FAIRGROUNDS	92014	SWF/LF
DEL MAR	S105693549	TEXACO REFINING & MARKETING	2205 VIA DE LA VALLE	92014	LUST
DEL MAR	S105693646	MOBIL	2750 VIA DE LA VALLE	92014	HAZNET, LUST
DEL MAR	S105694265	TEXACO/VIA DE LA VALLE 2205	2205 VIA DE LA VALLE	92014	LUST
SAN DIEGO	S103990101	SW MARINE INC/USS JUNEAU	32ND ST NAVAL BASE	92130	HAZNET, CHMIRS
SAN DIEGO	S103655862	TEXACO REFINING AND MARKETING INC	3711 W CAMINO DEL RIO/HANCOCK	92130	HAZNET
SAN DIEGO	S103987183	SCRIPPS CLINIC DEL MAR	12395 EL CAMINO REAL STE 120	92130	HAZNET
SAN DIEGO	S104575006	SKRIPPS CLINIC DEL MAR RADIOLOGY	12395 EL CAMINO REAL STES 101,120	92130	HAZNET
SAN DIEGO	S103655858	TEXACO REFINING AND MARKETING INC	3711 S EL CAMINO DEL RIO	92130	HAZNET

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

FEDERAL ASTM STANDARD RECORDS

NPL: National Priority List
Source: EPA
Telephone: N/A
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 01/29/03
Date Made Active at EDR: 03/04/03
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 02/04/03
Elapsed ASTM days: 28
Date of Last EDR Contact: 02/04/03

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 6
Telephone: 214-655-6659

EPA Region 8
Telephone: 303-312-6774

Proposed NPL: Proposed National Priority List Sites
Source: EPA
Telephone: N/A

Date of Government Version: 01/29/03
Date Made Active at EDR: 03/04/03
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 02/04/03
Elapsed ASTM days: 28
Date of Last EDR Contact: 02/04/03

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
Source: EPA
Telephone: 703-413-0223
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 03/19/03
Date Made Active at EDR: 04/08/03
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 03/24/03
Elapsed ASTM days: 15
Date of Last EDR Contact: 03/24/03

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned
Source: EPA
Telephone: 703-413-0223
As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

Date of Government Version: 03/19/03
Date Made Active at EDR: 04/08/03
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 03/24/03
Elapsed ASTM days: 15
Date of Last EDR Contact: 03/24/03

CORRACTS: Corrective Action Report
Source: EPA
Telephone: 800-424-9346
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 01/15/03
Date Made Active at EDR: 03/04/03
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 01/21/03
Elapsed ASTM days: 42
Date of Last EDR Contact: 03/10/03

RCRIS: Resource Conservation and Recovery Information System
Source: EPA/NTIS
Telephone: 800-424-9346
Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Date of Government Version: 09/09/02
Date Made Active at EDR: 10/28/02
Database Release Frequency: Varies
Date of Data Arrival at EDR: 09/24/02
Elapsed ASTM days: 34
Date of Last EDR Contact: 04/18/03

ERNS: Emergency Response Notification System
Source: National Response Center, United States Coast Guard
Telephone: 202-260-2342
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/01
Date Made Active at EDR: 07/15/02
Database Release Frequency: Annually
Date of Data Arrival at EDR: 07/02/02
Elapsed ASTM days: 13
Date of Last EDR Contact: 04/28/03

FEDERAL ASTM SUPPLEMENTAL RECORDS

BRS: Biennial Reporting System
Source: EPA/NTIS
Telephone: 800-424-9346
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/99
Database Release Frequency: Biennially
Date of Last EDR Contact: 03/17/03
Date of Next Scheduled EDR Contact: 06/16/03

CONSENT: Superfund (CERCLA) Consent Decrees
Source: EPA Regional Offices
Telephone: Varies
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: N/A
Database Release Frequency: Varies
Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

ROD: Records Of Decision
Source: EPA
Telephone: 703-416-0223
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 01/09/03
Database Release Frequency: Annually

Date of Last EDR Contact: 04/07/03
Date of Next Scheduled EDR Contact: 07/07/03

DELISTED NPL: National Priority List Deletions
Source: EPA
Telephone: N/A
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 01/29/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 02/04/03
Date of Next Scheduled EDR Contact: 05/05/03

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report
Source: EPA
Telephone: N/A
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 01/14/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/07/03
Date of Next Scheduled EDR Contact: 07/07/03

HMIRS: Hazardous Materials Information Reporting System
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 11/30/02
Database Release Frequency: Annually

Date of Last EDR Contact: 04/25/03
Date of Next Scheduled EDR Contact: 07/21/03

MLTS: Material Licensing Tracking System
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/16/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/07/03
Date of Next Scheduled EDR Contact: 07/07/03

MINES: Mines Master Index File
Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959

Date of Government Version: 09/10/02
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/31/03
Date of Next Scheduled EDR Contact: 06/30/03

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 205-564-4267
Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 02/27/03
Date of Next Scheduled EDR Contact: 05/26/03

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-564-3887
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/12/02
Database Release Frequency: Annually

Date of Last EDR Contact: 02/10/03
Date of Next Scheduled EDR Contact: 05/12/03

DOD: Department of Defense Sites
Source: USGS
Telephone: 703-648-5920
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 10/01/02
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/10/03
Date of Next Scheduled EDR Contact: 05/12/03

RAATS: RCRA Administrative Action Tracking System
Source: EPA
Telephone: 202-564-4104
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 03/10/03
Date of Next Scheduled EDR Contact: 06/09/03

TRIS: Toxic Chemical Release Inventory System
Source: EPA
Telephone: 202-260-1531
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/00
Database Release Frequency: Annually

Date of Last EDR Contact: 03/25/03
Date of Next Scheduled EDR Contact: 06/23/03

TSCA: Toxic Substances Control Act
Source: EPA
Telephone: 202-260-5521
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/98
Database Release Frequency: Every 4 Years

Date of Last EDR Contact: 03/06/03
Date of Next Scheduled EDR Contact: 06/09/03

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA
Telephone: 202-564-2501

Date of Government Version: 01/28/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/24/03
Date of Next Scheduled EDR Contact: 06/23/03

SSTS: Section 7 Tracking Systems
Source: EPA
Telephone: 202-564-5008
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/00
Database Release Frequency: Annually
Date of Last EDR Contact: 04/23/03
Date of Next Scheduled EDR Contact: 07/21/03

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-564-2501
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/28/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/24/03
Date of Next Scheduled EDR Contact: 06/23/03

STATE OF CALIFORNIA ASTM STANDARD RECORDS

AWP: Annual Workplan Sites
Source: California Environmental Protection Agency
Telephone: 916-323-3400
Known Hazardous Waste Sites. California DTSC's Annual Workplan (AWP), formerly BEP, identifies known hazardous substance sites targeted for cleanup.

Date of Government Version: 03/31/03
Date Made Active at EDR: 04/25/03
Database Release Frequency: Annually
Date of Data Arrival at EDR: 04/07/03
Elapsed ASTM days: 18
Date of Last EDR Contact: 04/07/03

CAL-SITES: Calsites Database
Source: Department of Toxic Substance Control
Telephone: 916-323-3400
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database.

Date of Government Version: 02/28/03
Date Made Active at EDR: 03/21/03
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 03/11/03
Elapsed ASTM days: 10
Date of Last EDR Contact: 03/11/03

CHMIRS: California Hazardous Material Incident Report System
Source: Office of Emergency Services
Telephone: 916-845-8400
California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/01
Date Made Active at EDR: 01/15/03
Database Release Frequency: Varies
Date of Data Arrival at EDR: 12/02/02
Elapsed ASTM days: 44
Date of Last EDR Contact: 02/24/03

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-9100
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 04/01/01 | Date of Data Arrival at EDR: 05/29/01
Date Made Active at EDR: 07/26/01 | Elapsed ASTM days: 58
Database Release Frequency: No Update Planned | Date of Last EDR Contact: 02/18/03

NOTIFY 65: Proposition 65 Records
Source: State Water Resources Control Board
Telephone: 916-445-3846
Proposition 65 Notification Records. NOTIFY 65 contains facility notifications about any release which could impact drinking water and thereby expose the public to a potential health risk.

Date of Government Version: 10/21/93 | Date of Data Arrival at EDR: 11/01/93
Date Made Active at EDR: 11/19/93 | Elapsed ASTM days: 18
Database Release Frequency: No Update Planned | Date of Last EDR Contact: 04/21/03

TOXIC PITS: Toxic Pits Cleanup Act Sites
Source: State Water Resources Control Board
Telephone: 916-227-4364
Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/95 | Date of Data Arrival at EDR: 08/30/95
Date Made Active at EDR: 09/26/95 | Elapsed ASTM days: 27
Database Release Frequency: No Update Planned | Date of Last EDR Contact: 02/03/03

SWF/LF (SWIS): Solid Waste Information System
Source: Integrated Waste Management Board
Telephone: 916-341-6320
Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 03/14/03 | Date of Data Arrival at EDR: 03/17/03
Date Made Active at EDR: 04/04/03 | Elapsed ASTM days: 18
Database Release Frequency: Quarterly | Date of Last EDR Contact: 03/17/03

WMUDS/SWAT: Waste Management Unit Database
Source: State Water Resources Control Board
Telephone: 916-227-4448
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/00 | Date of Data Arrival at EDR: 04/10/00
Date Made Active at EDR: 05/10/00 | Elapsed ASTM days: 30
Database Release Frequency: Quarterly | Date of Last EDR Contact: 03/17/03

LUST: Leaking Underground Storage Tank Information System
Source: State Water Resources Control Board
Telephone: 916-341-5740
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 04/02/03 | Date of Data Arrival at EDR: 04/16/03
Date Made Active at EDR: 04/25/03 | Elapsed ASTM days: 9
Database Release Frequency: Quarterly | Date of Last EDR Contact: 04/16/03

CA BOND EXP. PLAN: Bond Expenditure Plan
Source: Department of Health Services
Telephone: 916-255-2118
Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/89
Date Made Active at EDR: 08/02/94
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 07/27/94
Elapsed ASTM days: 6
Date of Last EDR Contact: 05/31/94

CA UST:

UST: Active UST Facilities
Source: SWRCB
Telephone: 916-341-5700
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 04/02/03
Date Made Active at EDR: 04/30/03
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 04/16/03
Elapsed ASTM days: 14
Date of Last EDR Contact: 04/16/03

VCP: Voluntary Cleanup Program Properties
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 02/28/03
Date Made Active at EDR: 04/04/03
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 03/05/03
Elapsed ASTM days: 30
Date of Last EDR Contact: 03/05/03

INDIAN UST: Underground Storage Tanks on Indian Land
Source: EPA Region 9
Telephone: 415-972-3368

Date of Government Version: N/A
Date Made Active at EDR: N/A
Database Release Frequency: Varies
Date of Data Arrival at EDR: N/A
Elapsed ASTM days: 0
Date of Last EDR Contact: N/A

CA FID UST: Facility Inventory Database
Source: California Environmental Protection Agency
Telephone: 916-445-6532
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/94
Date Made Active at EDR: 09/29/95
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 09/05/95
Elapsed ASTM days: 24
Date of Last EDR Contact: 12/28/98

HIST UST: Hazardous Substance Storage Container Database
Source: State Water Resources Control Board
Telephone: 916-341-5700
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/90
Date Made Active at EDR: 02/12/91
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 01/25/91
Elapsed ASTM days: 18
Date of Last EDR Contact: 07/26/01

STATE OF CALIFORNIA ASTM SUPPLEMENTAL RECORDS

AST: Aboveground Petroleum Storage Tank Facilities
Source: State Water Resources Control Board
Telephone: 916-341-5712
Registered Aboveground Storage Tanks.

Date of Government Version: 03/18/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 02/03/03
Date of Next Scheduled EDR Contact: 05/05/03

CLEANERS: Cleaner Facilities
Source: Department of Toxic Substance Control
Telephone: 916-225-0873
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 03/18/02
Database Release Frequency: Annually
Date of Last EDR Contact: 04/07/03
Date of Next Scheduled EDR Contact: 07/07/03

CA WDS: Waste Discharge System
Source: State Water Resources Control Board
Telephone: 916-657-1571
Sites which have been issued waste discharge requirements.

Date of Government Version: 03/21/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/24/03
Date of Next Scheduled EDR Contact: 06/23/03

DEED: List of Deed Restrictions
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
The use of recorded land use restrictions is one of the methods the DTSC uses to protect the public from unsafe exposures to hazardous substances and wastes.

Date of Government Version: 04/04/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/07/03
Date of Next Scheduled EDR Contact: 07/07/03

NFA: No Further Action Determination
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains properties at which DTSC has made a clear determination that the property does not pose a problem to the environment or to public health.

Date of Government Version: 02/28/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/11/03
Date of Next Scheduled EDR Contact: 06/02/03

REF: Unconfirmed Properties Referred to Another Agency
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains properties where contamination has not been confirmed and which were determined as not requiring direct DTSC Site Mitigation Program action or oversight. Accordingly, these sites have been referred to another state or local regulatory agency.

Date of Government Version: 03/18/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/11/03
Date of Next Scheduled EDR Contact: 06/02/03

SCH: School Property Evaluation Program
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 02/28/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/11/03
Date of Next Scheduled EDR Contact: 06/02/03

NFE: Properties Needing Further Evaluation
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains properties that are suspected of being contaminated. These are unconfirmed contaminated properties that need to be assessed using the PEA process. PEA in Progress indicates properties where DTSC is currently conducting a PEA. PEA Required indicates properties where DTSC has determined a PEA is required, but not currently underway.

Date of Government Version: 02/28/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/11/03
Date of Next Scheduled EDR Contact: 06/02/03

HAZNET: Hazardous Waste Information System
Source: California Environmental Protection Agency
Telephone: 916-255-1136
Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/01
Database Release Frequency: Annually

Date of Last EDR Contact: 02/10/03
Date of Next Scheduled EDR Contact: 05/12/03

LOCAL RECORDS

ALAMEDA COUNTY:

Local Oversight Program Listing of UGT Cleanup Sites
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

Date of Government Version: 12/02/02
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/28/03
Date of Next Scheduled EDR Contact: 07/28/03

Underground Tanks
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

Date of Government Version: 11/26/02
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/28/03
Date of Next Scheduled EDR Contact: 07/28/03

CONTRA COSTA COUNTY:

Site List
Source: Contra Costa Health Services Department
Telephone: 925-646-2286
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 06/05/02
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/03/03
Date of Next Scheduled EDR Contact: 06/02/03

FRESNO COUNTY:

CUPA Resources List
Source: Dept. of Community Health
Telephone: 559-445-3271
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 03/28/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 01/24/03
Date of Next Scheduled EDR Contact: 05/12/03

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Kern County Sites and Tanks Listing.

Date of Government Version: 03/25/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/10/03
Date of Next Scheduled EDR Contact: 06/09/03

LOS ANGELES COUNTY:

List of Solid Waste Facilities
Source: La County Department of Public Works
Telephone: 818-458-5185

Date of Government Version: 03/01/03
Database Release Frequency: Varies

Date of Last EDR Contact: 02/20/03
Date of Next Scheduled EDR Contact: 05/19/03

City of El Segundo Underground Storage Tank
Source: City of El Segundo Fire Department
Telephone: 310-607-2239

Date of Government Version: 03/01/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/18/03
Date of Next Scheduled EDR Contact: 05/19/03

City of Long Beach Underground Storage Tank
Source: City of Long Beach Fire Department
Telephone: 562-570-2543

Date of Government Version: 05/30/02
Database Release Frequency: Annually

Date of Last EDR Contact: 02/24/03
Date of Next Scheduled EDR Contact: 05/26/03

City of Torrance Underground Storage Tank
Source: City of Torrance Fire Department
Telephone: 310-618-2973

Date of Government Version: 02/25/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/18/03
Date of Next Scheduled EDR Contact: 05/19/03

City of Los Angeles Landfills
Source: Engineering & Construction Division
Telephone: 213-473-7869

Date of Government Version: 03/01/02
Database Release Frequency: Varies

Date of Last EDR Contact: 03/17/03
Date of Next Scheduled EDR Contact: 06/16/03

HMS: Street Number List
Source: Department of Public Works
Telephone: 626-458-3517
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 02/27/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/18/03
Date of Next Scheduled EDR Contact: 05/19/03

Site Mitigation List
Source: Community Health Services
Telephone: 323-890-7806
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/07/03
Database Release Frequency: Annually
Date of Last EDR Contact: 02/18/03
Date of Next Scheduled EDR Contact: 05/19/03

San Gabriel Valley Areas of Concern
Source: EPA Region 9
Telephone: 415-972-3178
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 12/31/98
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 06/29/99
Date of Next Scheduled EDR Contact: N/A

MARIN COUNTY:

Underground Storage Tank Sites
Source: Public Works Department Waste Management
Telephone: 415-499-6647
Currently permitted USTs in Marin County.

Date of Government Version: 03/04/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 02/03/03
Date of Next Scheduled EDR Contact: 05/05/03

NAPA COUNTY:

Sites With Reported Contamination
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 03/31/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/31/03
Date of Next Scheduled EDR Contact: 06/30/03

Closed and Operating Underground Storage Tank Sites
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 03/31/03
Database Release Frequency: Annually
Date of Last EDR Contact: 03/31/03
Date of Next Scheduled EDR Contact: 06/30/03

ORANGE COUNTY:

List of Underground Storage Tank Cleanups
Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 11/04/02
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/14/03
Date of Next Scheduled EDR Contact: 06/09/03

List of Underground Storage Tank Facilities
Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 11/27/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/14/03
Date of Next Scheduled EDR Contact: 06/09/03

List of Industrial Site Cleanups
Source: Health Care Agency
Telephone: 714-834-3446
Petroleum and non-petroleum spills.

Date of Government Version: 10/24/00
Database Release Frequency: Annually

Date of Last EDR Contact: 03/14/03
Date of Next Scheduled EDR Contact: 06/09/03

PLACER COUNTY:

Master List of Facilities
Source: Placer County Health and Human Services
Telephone: 530-889-7312
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 02/03/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/25/03
Date of Next Scheduled EDR Contact: 06/23/03

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Source: Department of Public Health
Telephone: 909-358-5055
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 02/24/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/21/03
Date of Next Scheduled EDR Contact: 07/21/03

Underground Storage Tank Tank List
Source: Health Services Agency
Telephone: 909-358-5055

Date of Government Version: 02/24/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/21/03
Date of Next Scheduled EDR Contact: 07/21/03

SACRAMENTO COUNTY:

CS - Contaminated Sites
Source: Sacramento County Environmental Management
Telephone: 916-875-8406

Date of Government Version: 10/25/02
Database Release Frequency: Quarterly

Date of Last EDR Contact: 02/03/03
Date of Next Scheduled EDR Contact: 05/05/03

ML - Regulatory Compliance Master List
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/05/02
Database Release Frequency: Quarterly

Date of Last EDR Contact: 02/03/03
Date of Next Scheduled EDR Contact: 05/05/03

SAN BERNARDINO COUNTY:

Hazardous Material Permits
Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 04/01/03 — Date of Last EDR Contact: 03/10/03
Database Release Frequency: Quarterly — Date of Next Scheduled EDR Contact: 06/09/03

SAN DIEGO COUNTY:

Solid Waste Facilities
Source: Department of Health Services
Telephone: 619-338-2209
San Diego County Solid Waste Facilities.

Date of Government Version: 08/01/00 — Date of Last EDR Contact: 02/24/03
Database Release Frequency: Varies — Date of Next Scheduled EDR Contact: 05/26/03

Hazardous Materials Management Division Database
Source: Hazardous Materials Management Division
Telephone: 619-338-2268
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 03/31/02 — Date of Last EDR Contact: 04/16/03
Database Release Frequency: Quarterly — Date of Next Scheduled EDR Contact: 07/07/03

SAN FRANCISCO COUNTY:

Local Oversite Facilities
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920

Date of Government Version: 03/17/03 — Date of Last EDR Contact: 03/10/03
Database Release Frequency: Quarterly — Date of Next Scheduled EDR Contact: 06/09/03

Underground Storage Tank Information
Source: Department of Public Health
Telephone: 415-252-3920

Date of Government Version: 03/17/03 — Date of Last EDR Contact: 03/10/03
Database Release Frequency: Quarterly — Date of Next Scheduled EDR Contact: 06/09/03

SAN MATEO COUNTY:

Fuel Leak List
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921

Date of Government Version: 03/13/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/28/03
Date of Next Scheduled EDR Contact: 07/28/03

Business Inventory
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 05/01/02
Database Release Frequency: Annually
Date of Last EDR Contact: 04/28/03
Date of Next Scheduled EDR Contact: 07/14/03

SANTA CLARA COUNTY:

Fuel Leak Site Activity Report
Source: Santa Clara Valley Water District
Telephone: 408-265-2600

Date of Government Version: 01/08/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/31/03
Date of Next Scheduled EDR Contact: 06/30/03

Hazardous Material Facilities
Source: City of San Jose Fire Department
Telephone: 408-277-4659

Date of Government Version: 01/03/02
Database Release Frequency: Annually
Date of Last EDR Contact: 03/10/03
Date of Next Scheduled EDR Contact: 06/09/03

SOLANO COUNTY:

Leaking Underground Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

Date of Government Version: 12/20/02
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/17/03
Date of Next Scheduled EDR Contact: 06/16/03

Underground Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

Date of Government Version: 12/18/02
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/17/03
Date of Next Scheduled EDR Contact: 06/16/03

SONOMA COUNTY:

Leaking Underground Storage Tank Sites
Source: Department of Health Services
Telephone: 707-565-6565

Date of Government Version: 01/01/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/28/03
Date of Next Scheduled EDR Contact: 07/28/03

SUTTER COUNTY:

Underground Storage Tanks
Source: Sutter County Department of Agriculture
Telephone: 530-822-7500

Date of Government Version: 07/01/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/07/03
Date of Next Scheduled EDR Contact: 07/07/03

VENTURA COUNTY:

Inventory of Illegal Abandoned and Inactive Sites
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 09/01/02
Database Release Frequency: Annually

Date of Last EDR Contact: 02/24/03
Date of Next Scheduled EDR Contact: 05/26/03

Listing of Underground Tank Cleanup Sites
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 03/10/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/17/03
Date of Next Scheduled EDR Contact: 06/16/03

Underground Tank Closed Sites List
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 10/21/02
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/17/03
Date of Next Scheduled EDR Contact: 06/16/03

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 02/11/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/17/03
Date of Next Scheduled EDR Contact: 06/16/03

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Source: Yolo County Department of Health
Telephone: 530-666-8646

Date of Government Version: 10/28/02
Database Release Frequency: Annually

Date of Last EDR Contact: 04/21/03
Date of Next Scheduled EDR Contact: 07/21/03

California Regional Water Quality Control Board (RWQCB) LUST Records

LUST REG 1: Active Toxic Site Investigation
Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-576-2220
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/01
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 02/24/03
Date of Next Scheduled EDR Contact: 05/26/03

LUST REG 2: Fuel Leak List
Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457

Date of Government Version: 03/28/03 | Date of Last EDR Contact: 04/15/03
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 07/14/03

LUST REG 3: Leaking Underground Storage Tank Database
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147

Date of Government Version: 02/18/03 | Date of Last EDR Contact: 02/18/03
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 05/19/03

LUST REG 4: Underground Storage Tank Leak List
Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-266-6600
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 08/09/01 | Date of Last EDR Contact: 03/31/03
Database Release Frequency: No Update Planned | Date of Next Scheduled EDR Contact: 06/30/03

LUST REG 5: Leaking Underground Storage Tank Database
Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-255-3125

Date of Government Version: 01/01/03 | Date of Last EDR Contact: 04/08/03
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 07/07/03

LUST REG 6L: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 916-542-5424
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 04/10/03 | Date of Last EDR Contact: 04/07/03
Database Release Frequency: No Update Planned | Date of Next Scheduled EDR Contact: 07/07/03

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-346-7491

Date of Government Version: 01/24/03 | Date of Last EDR Contact: 04/07/03
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 07/07/03

LUST REG 7: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-346-7491

Date of Government Version: 07/02/02 | Date of Last EDR Contact: 03/31/03
Database Release Frequency: Semi-Annually | Date of Next Scheduled EDR Contact: 06/30/03

LUST REG 8: Leaking Underground Storage Tanks
Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4498
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/14/03 | Date of Last EDR Contact: 02/10/03
Database Release Frequency: No Update Planned | Date of Next Scheduled EDR Contact: 05/12/03

LUST REG 9: Leaking Underground Storage Tank Report
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/01 | Date of Last EDR Contact: 04/21/03
Database Release Frequency: No Update Planned | Date of Next Scheduled EDR Contact: 07/21/03

California Regional Water Quality Control Board (RWQCB) SLIC Records

SLIC REG 1: Active Toxic Site Investigations
Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220

Date of Government Version: 04/03/03 | Date of Last EDR Contact: 03/10/03
Database Release Frequency: Semi-Annually | Date of Next Scheduled EDR Contact: 05/26/03

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 03/28/03 | Date of Last EDR Contact: 04/15/03
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 07/14/03

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 02/18/03 | Date of Last EDR Contact: 02/18/03
Database Release Frequency: Semi-Annually | Date of Next Scheduled EDR Contact: 05/19/03

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 02/01/03 | Date of Last EDR Contact: 04/28/03
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 07/28/03

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-855-3075
Unregulated sites that impact groundwater or have the potential to impact groundwater.

Date of Government Version: 03/01/03 | Date of Last EDR Contact: 04/08/03
Database Release Frequency: Semi-Annually | Date of Next Scheduled EDR Contact: 07/07/03

SLIC REG 6L: SLIC Sites
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574

Date of Government Version: 04/10/03 | Date of Last EDR Contact: 03/10/03
Database Release Frequency: Varies | Date of Next Scheduled EDR Contact: 06/09/03

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583

Date of Government Version: 07/19/01
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/08/03
Date of Next Scheduled EDR Contact: 07/07/03

SLIC REG 7: SLIC List
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491

Date of Government Version: 03/01/03
Database Release Frequency: Varies
Date of Last EDR Contact: 02/28/03
Date of Next Scheduled EDR Contact: 05/26/03

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-3298

Date of Government Version: 06/01/02
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/21/03
Date of Next Scheduled EDR Contact: 07/07/03

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980

Date of Government Version: 03/03/03
Database Release Frequency: Annually
Date of Last EDR Contact: 03/03/03
Date of Next Scheduled EDR Contact: 06/02/03

EDR PROPRIETARY HISTORICAL DATABASES

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. ©Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

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OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

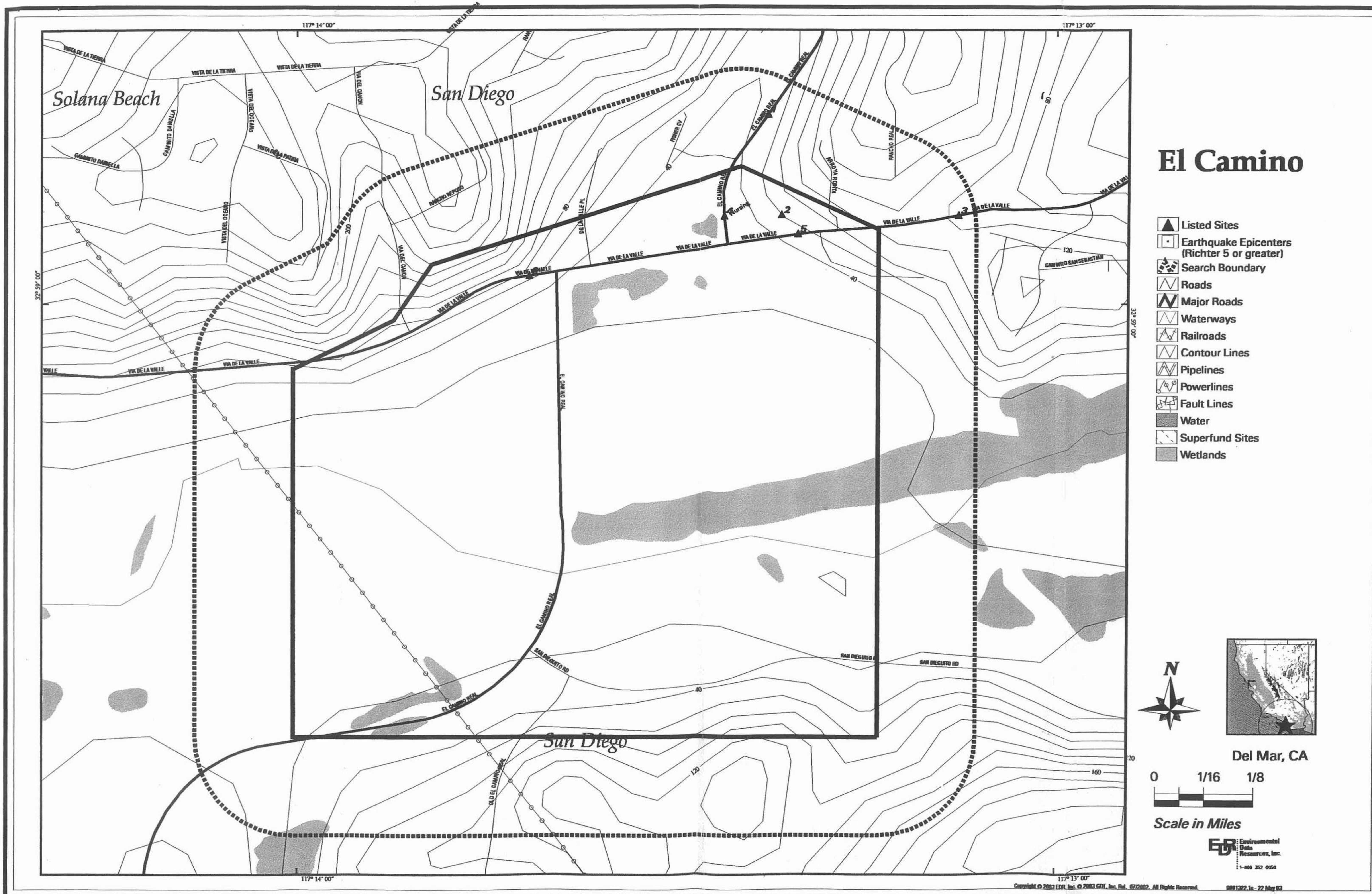
Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

STREET AND ADDRESS INFORMATION

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.


El Camino
Listed Sites
Earthquake Epicenters (Richter 5 or greater)
Search Boundary
Roads
Major Roads
Waterways
Railroads
Contour Lines
Pipelines
Powerlines
Fault Lines
Water
Superfund Sites
Wetlands
Solana Beach
San Diego
San Diego
VIA DE LA VALLE
EL CAMINO REAL
SAN DIEGUITO RD
OLD EL CAMINO REAL
VISTA DE LA TIERRA
VIA DEL CANON
VISTA DEL OCEANO
CAMINITO DANIELLA
CAMINITO SAN SEBASTIAN
RANCHO REAL
117° 14' 00"
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32° 59' 00"
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Del Mar, CA
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Scale in Miles
EDR Environmental Data Resources, Inc.