(Revised) Biological Technical Report
REDLANDS PASSENGER RAIL PROJECT
Redlands, San Bernardino County, California

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Acronyms

ACB	Articulated Concrete Block
AMSL	Above Mean Sea Level
BMP	Best management practice
BNSF	Burlington Northern Santa Fe Railroad
BTR	Biological Technical Report
BUOW	Burrowing owl
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CISS	Cast-in-steel-shell
CMF	Central Maintenance Facility
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CPUC	California Public Utilities Commission
CWA	Clean Water Act
DH	Disturbed habitat
DSBPRP	Downtown San Bernardino Passenger Rail Project
DW	Disturbed Wetland
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
EW	Eucalyptus Woodland
FBS	Flat-top Buckwheat Scrub
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GLA	Glenn Lukos Associates
HA	Hydrologic Area
HAS	Hydrologic Subarea
HDR	HDR Engineering, Inc.
HCP	Habitat Conservation Plan
IEMF	Inland Empire Maintenance Facility
I-10	Interstate 10
I-215	Interstate 215
MBTA	Migratory Bird Treaty Act
MFS	Mulefat Scrub
MOU	Memoranda of Understanding
MP	Mile Post
NCCP	Natural Communities Conservation Planning
NEPA	National Environmental Policy Act
NJD	Non-Jurisdictional Ditch
NNG	Non-native grasslands
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OHWM	Ordinary High Water Mark
OV	Orchards and Vineyards
OW	Oak Woodland
PCE	Primary Constituent Elements
RAFSS	Riversidean alluvial fan sage scrub

ROW	Right-of-Way
RPRP	Redlands Passenger Rail Project
RWQCB	Regional Water Quality Control Board
SANBAG	San Bernardino County Associated Governments
SAR	Santa Ana River
SAS	Santa Ana Sucker
SBCFCD	San Bernardino County Flood Control
SBKR	San Bernardino kangaroo rat
SCRRA	Southern California Regional Railroad Authority
SCWRF	Southern Cottonwood Willow Riparian Forest
SP	Soil Pit
SWIFL	Southwestern Willow Flycatcher
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SWS	Southern Willow Scrub
TDA	Tom Dodson and Associates
TS	Tamarisk Scrub
UD	Urban developed
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WYBC	Western Yellow-billed Cuckoo

EXECUTIVE SUMMARY

The Redlands Passenger Rail Project (RPRP or Project) was developed by the San Bernardino Associated Governments (SANBAG) to address the transportation needs of the Redlands Corridor, which encompasses an approximate nine (9) mile corridor extending from the City of San Bernardino southeast to the City of Redlands. The Project proposes the construction of new track and bridge infrastructure to support passenger and freight service from E Street in the City of San Bernardino east to University Avenue in the City of Redlands. Construction of the new track would occur along an approximately 9.1 mile section of existing railroad right-of-way owned by SANBAG.

This Biological Technical Report (BTR) has been prepared for the proposed project with the Federal Transit Administration (FTA) as the lead agency under the National Environmental Policy Act (NEPA), and SANBAG as lead agency under the California Environmental Quality Act (CEQA). The BTR addresses the federal Endangered Species Act (ESA), California ESA, NEPA, CEQA, and other applicable federal, state, and local requirements for analysis of potential impacts on biological resources resulting from the construction of the proposed project.

This BTR integrates information collected from a variety of literature sources and field surveys to describe the biological resources within the vicinity of the survey area. Information was gathered from publicly available literature, data provided by relevant land management agencies, reviews of aerial photography and U.S. Geological Survey (USGS) topographic maps, data from the State of California, data from the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), and the results of field surveys conducted in 2012. The purpose of the data collection and analysis for this report is to: (1) assemble a vascular plant and vertebrate animal inventory of the site; (2) determine whether any sensitive species or habitats could be significantly impacted by development of the proposed project; and (3) propose mitigation measures that could avoid or minimize impacts of construction, and maintenance and operation of the proposed project.

Surveys

Various field surveys have been conducted for the proposed project and include:

- Jurisdictional Delineation of federal wetlands and waters, and California Department of Fish and Wildlife jurisdictional features;
- Protocol Surveys for the federally endangered least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and San Bernardino kangaroo rat (*Dipodomys merriami parvus*),
- Habitat assessment for the federally endangered Santa Ana sucker (*Catostomus santaanae*);
- Protocol surveys for the California Species of Special Concern, western burrowing owl (*Athene cunicularis hypugaea*);
- Focused rare plant surveys; and
- General vegetation mapping and floral and faunal compendium.

Sensitive Species

Multiple sensitive plant and wildlife species were observed or have critical habitat mapped within the survey area for the proposed project. These sensitive plant and wildlife species include the following:

- One individual Santa Ana River woolly star (federally listed as Threatened) was observed within the study area at the Santa Ana River.

- Five individual least Bell's vireo (federally listed as Endangered) were observed within the study area at the confluence of the Mission Zanja Flood Control Channel.
- A single western burrowing owl (State special status species) was observed north of the East Street Platform outside of the breeding season in downtown San Bernardino.
- Critical habitat for Santa Ana sucker and San Bernardino kangaroo rat occurs within the study area at the Santa Ana River.
- Presence of western spadefoot toads is assumed within the vicinity of the SAR and Mission Zanja Flood Control Channel due to suitable habitat conditions.
- Implementation of the proposed project would impact up to 6.23 acres of U. S. Army Corps of Engineers (USACE) jurisdictional area. Permanent impacts to USACE jurisdiction are 0.30 acres. Temporary impacts to USACE jurisdiction are the remaining 5.93 acres.
- Implementation of the proposed project would impact up to 14.92 acres of CDFW jurisdiction. Permanent impacts to CDFW jurisdiction are 1.65 acres. Temporary impacts to CDFW jurisdiction comprise the remaining 13.27 acres.

1.0 PROJECT DESCRIPTION AND LOCATION

1.1 DESCRIPTION OF THE PREFERRED PROJECT

The Redlands Passenger Rail Project (RPRP or Project) would involve the implementation rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. Appendix A, Figure 1 depicts the project location.

Construction of the Project would occur within an existing railroad right-of-way (ROW) owned by the San Bernardino Associated Governments (SANBAG). SANBAG's ROW averages 50 to 100 feet in width with the exception of portions of downtown Redlands where the ROW measures less than 40 feet. Additional details regarding each of the components comprising the preferred Project and associated operations are described under the following subheadings.

Track Improvements

The Project would include the construction of track improvements to facilitate train movements along a single track through the rail corridor with an approximately 10,000-foot-long section of passing track or siding, from just west of Richardson Street to just east of California Street (Mile Post [MP] 5.5 to MP 7.4). The proposed track ballast and sub-grade along the 9-mile project corridor would be constructed to 50 feet in width, sufficient to support a parallel maintenance road. In downtown Redlands, this width would be reduced to less than 40 feet in recognition of the constrained ROW. This would require demolition and replacement of the existing track. The rail improvements would also include the construction of a new train signaling and communications system.

Structural Crossings and Bridges

The Project would require the replacement or retrofitting of up to six structural crossings to facilitate the loading requirements of the passenger trains and track foundation. These structural crossings consist of existing bridge structures located at Warm Creek (Historic) at MP 1.1; Twin Creek at MP 2.2; the Santa Ana River at MP 3.4; the Gage Canal at MP 3.8; Bryn Mawr Avenue at MP 5.78; and Mill Zanja Creek at MP 9.4.

Water Crossings

The project will include preparation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will identify Best Management Practices (BMPs) to address potential short-term impacts and post-construction (long-term) measures to be implemented for the project. Stormwater pollution prevention BMPs included as a part of the SWPPP would be implemented in accordance with the California Stormwater Construction Handbook (latest edition) and the Construction General Permit Order No. 2009-0009-DWQ.

Construction could also involve limited dredging of material from the channel bed and/or excavation along the adjacent banks. These activities could also include the placement of fill including concrete and riprap. To minimize construction activity in the channel, the structural improvements would be constructed in two or more phases to the minimize disturbance to the channel bottom and allow for the safe passage of water flow. A similar approach would be employed for the removal of any existing structures. To minimize the sedimentation, in-channel construction activities would be limited to the period between April 15 and October 15 to the extent feasible.

Construction of the structural crossings at local waterways, including the SAR, may require the isolation of the work zone through the installation of a cofferdam and/or construction work pads within the wet area. New structural supports would be constructed behind a temporary cofferdam constructed of sheet piling or similar method, such as the use of cast-in-steel-shell (CISS) piles. The structural foundation

would consist of a reinforced concrete supported by piling, with conventional reinforced concrete piers extending up to the bridge decks.

To minimize the potential for falling debris into local waterways during bridge construction, a debris containment system would be installed under the bridge to catch any falling debris. If flow is present and as an additional precaution, a boom would be strung across the water feature to keep any material that escapes the containment system from being carried down stream.

Roadway Grade Crossings and Signaling

The survey area traverses 32 existing roadway grade crossings including two I-10 underpasses. Roadways grade crossing not subject to closure would be re-designed in accordance with the latest *Grade Crossing Design* guidelines that require in certain cases raised medians, widened sidewalks, traffic striping, flashing lights, pedestrian gate arms where requested by the California Public Utilities Commission (CPUC), and swing gates.

Proposed Rail Platforms

There are currently five (5) station stops proposed for the Project with new rail platforms proposed at four (4) locations. Two (2) station stops (E Street and Tippecanoe Avenue) would be located in the City of San Bernardino, while the other three (3) (New York Street, Downtown Redlands, and the University of Redlands) would be located in the City of Redlands. The E Street Rail Platform would be constructed in conjunction with the already approved Downtown San Bernardino Passenger Rail Project (DSBPRP) and, therefore, only track improvements would be required west of E Street to align the Project tracks with the planned rail platforms.

Rail platforms would in most instances be less than 200 feet long[1]. Pedestrian crossovers would be provided for each platform with accessible parking provided adjacent to pedestrian crossovers.

Train Layover Facility

The Project would require the development of a new Train Layover Facility to include sufficient storage tracks for maintenance activities and operational activities including offices, training rooms, and a crew break room. The Train Layover Facility would be constructed on a long narrow site immediately south of I-10 and west of California Street and would contain up to seven spur tracks.

Utility Replacement and Relocation

The Project would likely necessitate the relocation of existing subsurface and overhead crossing utilities (i.e., water, sewer, storm drain, power, gas, fiber optic, and telephone lines) in accordance with applicable utility accommodation design criteria and engineering standards. The exact method of improvement, if required, would be determined in coordination with the affected utility provider in conjunction with the Project's final design.

Drainage

Several drainage facility improvements would be necessary to accommodate the project. It is anticipated that a majority of the storm drain facilities would be protected in place and would not need to be lowered to meet minimum depth requirements. However, it is likely that the majority of the storm drain casings within the rail ROW would need to be extended to span the entire width of the rail ROW. These improvements would be coordinated with the cities of San Bernardino and Redlands along with San Bernardino County Flood Control District (SBCFCD). In addition, longitudinal storm drain lines located within the rail corridor would need to be relocated further from the proposed track centerlines to comply with BNSF engineering standards.

[1] A minimum of 170 feet is required to accommodate two 85-foot Bombardier passenger coaches.

Mission Zanja Channel Improvements. Mission Zanja Flood Control Channel runs parallel to the rail line from the Santa Ana River (SAR) to approximately 900 feet west of California Street for a distance of approximately 2.6 miles where it diverges from the Survey Area to the south. At approximately milepost 9.4 (Bridge 9.4), the creek rejoins the railroad further east, as Mill Creek Zanja , where it passes under the railroad just west of the I-10 overcrossing.

Mission Zanja Channel is characterized as an improved, trapezoidal earthen channel with some segments including wire revetment (USACE, 1994). To ensure the structural integrity of the track improvements along sections of Mission Zanja Channel, the Project may include bank stabilization improvements (e.g., armoring, slope keying, etc.) to the northern bank of the Mission Zanja Channel, from MP 3.5 to just east of MP 6, to ensure that the bank is able to support the additional loading requirements and withstand scour during high flow events. At this time, SANBAG is considering the use of an articulated concrete block (ACB) to support the armoring of the northern bank, which would allow for the growth of limited vegetation. This improvement would be coordinated and constructed with the SBCFCD, which maintains the Mission Zanja Channel.

Maintenance

Maintenance of the railroad ROW is currently the responsibility of BNSF, which is the current operator of the rail line. This includes routine maintenance of the track and track ties, grade crossings, and communication system. Vegetation management and weed abatement would also be required along the ROW. Each platform would also require routine landscaping and facility maintenance (e.g., replacement of lighting fixtures). Typical railroad maintenance and inspections would be conducted by a contractor hired by SANBAG throughout the operational phase of the Project in accordance with SCRRA/Metrolink and BNSF standard practices.

Construction

Construction of the proposed Project would begin in 2015 and take up to 36 months to complete. Construction would proceed generally from the west of E Street to the SAR and similarly from the SAR east to Cook Street. Construction scheduling and phasing would ultimately be at the discretion of SANBAG's contractor. A description of anticipated construction activities over the course of Project construction is provided as follows:

- Construction easement acquisition, clearing and grubbing, and removal of existing track;
- Relocate, extend, or encase utilities, as appropriate, to remove conflicts;
- Construct embankments, culvert extensions, an retaining walls for the proposed rail corridor, as necessary;
- Re-grade, install drainage, and construct bridge crossings, including as appropriate, new, standard height parapets on both sides of each bridge, construct in-fill walls, plug deck drains, construct new spread footings at each pile, and seal parapet joints;
- Construct new rail platforms at proposed rail platform locations and layover facility; and,
- Construct new continuous welded rail track, roadway grade crossings, and install pedestrian access improvements and landscaping, where appropriate.

These activities would likely overlap at times. Staging areas for construction equipment and materials would be located primarily within the SANBAG ROW to the extent feasible. In addition, a part of the proposed layover facility would be used as a centralized construction staging area for heavy equipment due to its centralized location along the rail corridor. The total construction area for the proposed Project is estimated at 134.9 acres.

1.1.1 ALTERNATIVES AND DESIGN OPTIONS

In conjunction with the environmental review for RPRP, SANBAG is considering several alternatives and design options for the project. The alternatives and design options evaluated in this BTR are identified and summarized below:

- ***Reduced Project Footprint Alternative.*** This alternative would involve a reduced construction area (127.7 acres) to minimize impacts to sensitive habitats. These reductions in the construction area occur at Twin Creek, the SAR, and along the Mission Zanja Flood Control Channel. Additionally, this alternative would include an alternate bridge design for Bridge 3.4 to further minimize permanent impacts to the SAR as a result of the placement of the new bridge pier foundations. All other aspects of this alternative would be similar to the Preferred Project.
- ***Design Option 1 (Layover at Waterman Avenue).*** Design Option 1 would entail the placement of the proposed layover facility at an alternative location, just east of Waterman Avenue and north of the railroad corridor. The total construction area under the design option would slightly increase to 140.5 acres. All other aspects of this design option would be similar to the Preferred Project.
- ***Design Options 2 (Use of Existing Layover Facilities).*** Design Option 2 would entail the use of existing layover facilities to the west of the Survey Area in place of constructing a new layover facility. The total construction area under the design option would decrease to 128.1 acres. All other aspects of this design option would be similar to the Preferred Project.
- ***Design Option 3 (Waterman Station).*** Design Option 3 would entail the construction of a new station platform just east of Waterman Avenue and south of the railroad corridor in place of the Tippecanoe Avenue platform. The total construction area under the design option would slightly increase to 136.6 acres. All other aspects of this design option would be similar to the Preferred Project.

Additionally, a No Build Alternative is under consideration as part of the environmental review. Under this alternative, SANBAG would not construction the project, but would still be required to perform regularly scheduled maintenance of the existing track and corresponding improvements at grade crossings and bridges to facilitate continued freight service per SANBAG's obligations with BNSF. As a result, the some renovation and rehabilitation of the railroad corridor, including replacement, would still be required. Impacts resulting from the No Build Alternative are not quantified in this BTR.

1.1.2 DEFINITIONS

The following definitions are used to describe the location of the various survey activities conducted during on-site fieldwork:

- ***Project area*** is defined as the limits of impacts associated with full build-out of the proposed project. The project area is synonymous with the proposed project's construction footprint, which is estimated at 134.9 acres.
- ***Survey area*** is defined as the area within 200 feet on either side of the centerline of the existing rail corridor that was mapped and evaluated for potential direct and indirect impacts to biological resources. In several instances, additional areas were added to the survey to include entire properties given uncertainties related to the actual placement of physical improvements. The survey area for the project is approximately 534 acres.

1.2 PROJECT LOCATION

The proposed action extends from the City of San Bernardino east to the City of Redlands within southwestern County of San Bernardino, California (Appendix A, Figure 1, RPRP Survey area). The

proposed action limits include the existing track and right-of-way along with adjacent areas beginning at E Street in San Bernardino and extend east to the University of Redlands, just east of University Avenue (Appendix A, Figures 2a and 2b, USGS Topographic Map).

1.2.1 PROJECT SOILS AND TOPOGRAPHY

Soils within the survey boundary were mapped using the Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2008). The proposed project crosses eight different soil types (Appendix A, Figure 3, Soils), including:

- ***Grangeville Fine Sandy Loam (Gr) –*** This nearly level soil occurs on alluvial fans and alluvial plains and is used for pasture, truck crops, tomatoes, and flowers. It is a poorly drained, very deep fine sandy loam derived from granitic alluvium. The available water holding capacity is 6 to 8.5 inches. Runoff is very slow, and the erosion hazard is slight. The elevation ranges from 50 to 200 feet.
- ***Tujunga Gravelly Loamy Sand (TvC), 0-9 percent slopes –*** This soil occurs on alluvial fans and flood plains and is used mainly for grazing. Tujunga series consists of very deep, somewhat excessively drained soils formed in alluvium weathered mostly from granitic sources. The soils formed in sandy alluvium derived mostly from granitic sources. Runoff is very low or negligible and permeability is rapid. The elevation ranges from 5 to 4,300 feet.
- ***Hanford Coarse Sandy Loam (HaC), 2-9 percent slopes –*** This soil occurs on stream bottoms, floodplains and alluvial fans and is used for growing a wide range of fruits, vegetables, and general farm crops. Hanford series consists of very deep, well drained soils that formed in moderately coarse textured alluvium dominantly from granite. Runoff is well drained or low and permeability is moderately rapid. The elevation ranges from 150 to 3,500 feet.
- ***Psamments and Fluvents, Frequently Flooded (Ps) –*** Psamment soils are sandy in all layers and are among the most productive rangeland soils. Psamments are used mostly as rangeland, pasture, or wildlife habitat. Fluvents are more the more or less freely drained entisols that have formed in recent water-deposited sediments on flood plains, fans, and deltas along rivers and small streams. Fluvents are used as rangeland, forest, pasture, or wildlife habitat and sometimes used as cropland. Most fluvents are frequently flooded with normal stratification of materials unless they are protected by dams or levees.
- ***Tujunga Loamy Sand (TvB), 0-5 percent slope –*** This soil occurs in somewhat excessively drained soils formed in alluvium and is used for growing citrus, grapes and other fruits but mainly used for grazing. Tujunga series consists of mostly weathered granitic sources. Runoff is very low to negligible with rapid permeability. The elevation ranges from 5-4,300 feet.
- ***Grangeville Fine Sandy Loam, Saline-Alkali (Gs) –*** This nearly level soil occurs on alluvial fans and alluvial plains and is used for pasture, truck crops, tomatoes, and flowers. It is a poorly drained, very deep fine sandy loam derived from granitic alluvium. The available water holding capacity is 6 to 8.5 inches. Formerly, most areas of Grangeville soils were occasionally flooded. Runoff is negligible, with moderate permeability in saline-sodic phases. The elevation ranges from 50 to 200 feet.
- ***Hanford Sandy Loam (HbA), 0-2 percent slopes –*** This soil occurs on stream bottoms, floodplains and alluvial fans and is used mostly for growing a wide range of fruits, vegetables, and general farm crops. Hanford series consists of mostly granite and other quartz bearing rocks. Runoff is well drained, negligible to low runoff, and with moderately rapid permeability. The elevation ranges from 150-3,500 feet.

- ***Ramona Sandy Loam (RmC), 2-9 percent slopes –*** This soil occurs on terraces and fans and used mostly for production of grain, irrigated citrus and deciduous fruits. Ramona series consists of mostly granitic and related rock sources. Runoff is slow to rapid and permeability is moderately slow. The elevation ranges from 250-3,500 feet.

1.3 TOPOGRAPHY

The survey area is located in the southeastern margin of the San Bernardino Basin, in un-sectioned portions of Township 1 South; Range 4 West and Township 1 South at elevations above 1,000 feet above mean sea level (AMSL) (Appendix A, Figures 2a and 2b). Survey area topography is typical of low land valley areas with gentle slopes ranging from 1 to 3 percent. The general topography within the survey area grades towards the SAR from the cities of San Bernardino and Redlands, respectively. Topographical elevations in the general proximity of the Santa Ana River averages 1,028 feet AMSL and extend up to 1,078 feet AMSL in the vicinity of downtown San Bernardino and 1,474 feet AMSL in downtown Redlands.

1.4 HYDROLOGY

The survey area is located within the SAR Watershed[2], which is approximately 2,800 square miles in area, originates at San Gorgonio Peak in San Bernardino County and drains southwesterly towards northwesterly through Riverside and Orange Counties prior to emptying into the Pacific Ocean at Newport Beach. The survey area is located with the Upper SAR Watershed, which corresponds with Hydrologic Area (HA) 801.50 and, more specially, Hydrologic Subareas (HAS) 801.52 (Bunker Hill) and 801.53 (Redlands). The boundary of these two HASs on generally corresponds with New York Street in the City of Redlands.

[2] Note the SAR Watershed is located within the South Coast Hydrologic Region and corresponds to Hydrologic Unit Code (HUC) 18070203 accordingly to the U.S. Geological Survey.

2.0 SURVEY METHODS AND LIMITATIONS

Numerous surveys have been conducted in and around the survey area in association with the proposed project. These surveys include a biological constraints memorandum; general biological survey with a focus on vegetation community classification and mapping and sensitive species habitat assessment; springtime rare plants; focused sensitive species including least Bell's vireo, southwestern willow flycatcher, western burrowing owl, Santa Ana sucker, and San Bernardino kangaroo rat; and a jurisdictional wetland and waterway delineation. Surveys were undertaken based on consultation with regulatory agencies including USFWS, California Department of Fish and Wildlife (CDFW), and United States Army Corps of Engineers (USACE) and based on the results of a California Natural Diversity Database (CNDDB) search of nine quadrangles including and surrounding the survey area (Appendix N). Surveys were conducted for sensitive species known to occur, or with the potential to occur within or adjacent to onsite habitat. A complete list of surveys conducted in association with this project and the dates they were conducted is shown in Appendix B. The methods used for these studies, as well as survey limitations, are discussed below. A discussion of the survey results can be found in Sections 2.1.1 through 2.2, and Section 3. All vascular plants and wildlife encountered during the survey periods are listed in Appendices C and D. Tables of sensitive botanical and zoological species with the potential to occur on-site are located in Appendices E and F.

2.1 GENERAL BIOLOGICAL SURVEY

2.1.1 HABITAT TYPES/VEGETATION

HDR biologists Allegra Simmons, Aaron Newton, Sean Harris and Summer Adleberg conducted vegetation mapping of the proposed alignment in February of 2012 (Appendix B). Where access permitted, the survey area was surveyed on-foot. Where access was prohibited (i.e., residences, gated properties, etc.) habitat type and vegetation was mapped opportunistically from adjacent areas with the use of binoculars, when necessary. Vegetation communities in this report generally follow Holland (1986). Botanical species discussed in this report follow both Latin and common names taken from the Jepson Manual (Hickman 1993). A comprehensive list of botanical species observed within the survey area during the field surveys is presented in Appendix C.

2.1.2 WILDLIFE

All wildlife species observed or detected during general biological, jurisdictional delineation, and focused species surveys were noted. Nomenclature for wildlife species follows Stebbins (2003) for reptiles and amphibians, American Ornithologists' Union (2009) for birds, Reid (2006) for mammals, and Emmel and Emmel (1973) for butterflies. A list of zoological species observed within the survey area during the field surveys is presented in Appendix D.

2.1.3 RARE PLANT SURVEY

A CNDDB search of nine quads surrounding and including the site identified several federal and state sensitive species known to occur in the region. From this search, seven (7) species of federally/state or CNPS list 2 (or above; CNPS 2010a) species were identified to have a low to high potential to occur within onsite habitat and include: federally endangered Santa Ana River woolly star (*Eriastrum densifolium ssp. sanctorum*), federally endangered slender-horned spineflower (*Dodecahema leptoceras*), federally endangered Gambel's water cress (*Nasturtium gambelii*), CNPS list 1B.1 Horn's milk-vetch (*Astragalus hornii* var. *hornii*), CNPS list 2.2 smooth tarplant (*Centromadia pungens* ssp. *laevis*), CNPS list 2.2 salt spring checkerbloom (*Sidalcea neomexicana)*, and CNPS list 2.1 California satintail (*Imperata brevifolia*) (Appendices E and N).

HDR biologists Allegra Simmons, Aaron Newton, Sean Harris, Summer Adleberg, Joseph Schroeder, and Dustin Janeke conducted focused surveys for sensitive plants known to occur, or with the potential to occur in the survey area. Rare plant survey dates, times, weather conditions, and surveyors are summarized in Table 1 below. Three separate surveys were conducted to capture the peak blooming period for smooth tarplant (Appendix B). The blooming period for the remaining sensitive species with potential to occur onsite is shorter than for the tarplant. Two surveys were conducted during the peak blooming period for these species. All areas supporting suitable habitat for sensitive species was surveyed on foot and at 10-meter transects where appropriate.

Table 1. Rare Plant Surveys-Survey Date, Time, Weather Conditions, and Surveyors

Date	Surveyors**	Time (Start/End)	Weather Conditions	Plants Surveyed
05/08/2012	AS/AN/SA/JS	1000/1700	0%cc, 75F, winds 1-2 mph	All species
05/09/2012	AS/AN/SA/JS	0800/1300	0%cc, 75F, winds 1-2 mph	All species
06/04/2012*	AS/AN	1747/1930 hours	0% cc, 76F, winds 1-6 mph	Smooth tarplant
06/05/2012*	AS/AN	0745/0957 hours	0% cc, 66F, winds 0-3 mph	Smooth tarplant
06/12/2012	AS/DJ	0830/1200 hours	0% cc, 80F, winds 0-3 mph	All species except for tarplant
07/09/2012*	SH	1800/2000 hours	0% cc, 100F, winds 3-4 mph	Smooth tarplant
07/10/2012*	SH	0546/0746 hours	15% cc, 70F, no wind	Smooth tarplant
07/10/2012*	SH	1803/1943 hours	15% cc, 107F, winds 2-4 mph	Smooth tarplant
07/11/2012*	SH	0625/0745 hours	10%cc, 73F, winds 3-6 mph	Smooth tarplant

* These surveys were conducted concurrently with western burrowing owl surveys as the two species share similar habitat. Suitable habitat for smooth tarplant extended beyond what was suitable for burrowing owl, thus, the remainder of tarplant habitat was surveyed once owl surveys were completed for the day.

** (AN) Aaron Newton, (AS) Allegra Simmons, (DJ) Dustin Janeke, (JS) Joseph Schroeder, (SA) Summer Adleberg, and (SH) Sean Harris.

Prior to surveying the SAR for Woolly Star (*Eriastrum densifolium* ssp. *sanctorum*), a reference population located east of highway 215 in the City of Highland was visited on May 7, 2012 and observed blooming. A complete list of all plant species observed during the rare plant survey and those observed opportunistically is presented in Appendix C.

2.1.4 LEAST BELL'S VIREO

Suitable habitat for the federally and state endangered least Bell's vireo (*Vireo bellii pusillus*; LBV) occurs within the survey area, primarily where the alignment crosses the SAR and adjacent to the western terminus of Mission Zanja Channel. HDR biologists Allegra Simmons and Aaron Newton conducted three of the eight required focused surveys for LBV between April 16 and May 8, 2012. Glenn Lukos Associates (GLA) biologist, Jeff Ahrens completed the remaining five surveys between May 21 and July 5, 2012. Survey methodology followed guidelines identified in Least Bell's Vireo Survey Guidelines prepared by the United States Fish and Wildlife Service (USFWS) on January 19, 2001 (USFWS 2001). Per the guidelines, surveys of the project area were conducted between dawn and 11:00a.m. and were surveyed where appropriate habitat was found. A detailed discussion of survey methods can be found in the Least Bell's Vireo Presence/Absence Survey Report located in Appendix G of this BTR. The surveys detected three non-mated male LBV, and one nested pair, all within the immediate vicinity of SAR corridor.

2.1.5 SOUTHWESTERN WILLOW FLYCATCHER

Protocol surveys for the southwestern willow flycatcher (*Empidonax traillii extimus*; SWIFL) were performed in all areas of suitable habitat on site. Suitable habitat occurs primarily where the alignment transects the SAR and runs adjacent to the western terminus of the Mission Zanja Channel.

Surveys were conducted in accordance with the 2010 USFWS guidelines[3], which stipulate that for Projects, five surveys (divided into three survey periods) shall be conducted in all areas of suitable habitat. One survey was conducted during the first survey period (May 15 to May 31). Two surveys were conducted during the second survey period (June 1 to June 24), and two surveys were conducted during the third survey period (June 25 to July 17).

GLA biologist Jeff Ahrens (TE052159-3) conducted the protocol surveys on May 21, June 1, June 11, June 25, and July 5, 2012. All surveys were conducted during the morning hours and were completed before 10:30 A.M. No surveys were conducted during extreme weather conditions (i.e., winds exceeding 15 miles per hour, rain, or temperatures in excess of 95ºF). All areas of suitable habitat were surveyed on foot by walking slowly and methodically. Taped vocalizations primarily using the willow flycatcher's main contact call "fitz-bew" was used to elicit responses from SWIFLs that might be present on site. No detection of SWIFL within the survey area was documented based on both sight and call. A detailed discussion of survey methods can be found in the Southwest Willow Flycatcher Presence/Absence Survey Report located in Appendix H of this BTR.

2.1.6 WESTERN BURROWING OWL

HDR biologists Allegra Simmons, Aaron Newton, Sean Harris, Summer Adleberg, and Joseph Schroeder conducted focused surveys for the California Species of Concern, western burrowing owl (*Athene cunicularis hypugaea*; BUOW). Surveys were conducted on April 10, May 7-8, June 4-5, and July 9-11, 2012. Survey methodology followed guidelines identified in the Staff Report on Burrowing Owl Mitigation prepared by the Department of Fish and Game on March 7, 2012 (CDFG 2012a). Per the guidelines, the project area and a 150-meter (500-foot) buffer surrounding the site were surveyed where appropriate habitat was found. No evidence of BUOW was documented during the focused surveys.

Following focused surveys in 2012, an individual BUOW was observed by HDR biologist Aaron Newton on January 9, 2013 during a site inspection at the western end of the survey area (near the intersection of West Rialto Avenue and E Street in the City of San Bernardino, CA). This area had previously been surveyed during focused burrowing owl surveys conducted for the project in 2012. Based on the results of the 2012 focused survey, this individual is likely wintering onsite or passing through the area. A detailed discussion of survey methodology can be found in the Burrowing Owl Survey Report prepared for the project and located in Appendix I.

2.1.7 SANTA ANA SUCKER

The portion of the survey area within the SAR occurs within critical habitat for the Santa Ana sucker (*Catostomus santaanae*; SAS). Specifically, this portion occurs within critical habitat Unit 1, Subunit 1a in an area that is not currently occupied by the species but provides transit of water and coarse materials downstream to occupied habitat. Substrate at the SAR/Bridge 3.4 is primarily sand with some coarser material mixed in. Sand dominates the river bed downstream to the Prado Basin. Course materials (gravel and cobbles) from upstream sources pass through the project area during larger runoff events when water velocity is high enough to transport them.

A number of barriers to upstream fish movement occur downstream of the Bridge 3.4 within the SAR. These include grade control structures at the I-10 freeway crossing and La Cadena Drive. Downstream distance to occupied habitat from the project site is approximately 2.25 miles.

Since Santa Ana suckers do not occur within the project area, a field survey was not required. A detailed description of the methodology used in the habitat assessment for Santa Ana sucker is provided in the Santa Ana Sucker Habitat Evaluation prepared by Cardno-Entrix in Appendix J.

[3] *A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher*, prepared by the USGS.

2.1.8 SAN BERNARDINO KANGAROO RAT

The survey area supports suitable habitat for the San Bernardino kangaroo rat (*Dipodomys merriami parvus*; SBKR). HDR contracted Tom Dodson and Associates (TDA) to conduct a focused SBKR habitat assessment of the survey area. On May 8, 2012, TDA Biologist, Shay Lawrey conducted a habitat suitability assessment for SBKR along the entire alignment. Ms. Lawrey walked the alignment to visually assess the site conditions. During the site walk over, Ms. Lawrey looked for burrows, tail drags, tracks, and scat indicative of kangaroo rats. She also looked at the soil type and level of friability as well as habitat type and habitat structure. Ms. Lawrey found that the area surrounding the SAR bridge crossing was the only area along the alignment suitable for SBKR. Since this area warranted follow-on surveys, Ms. Lawrey conducted a focused trapping survey between May 18 and May 23, 2012.

The trapping protocol calls for five consecutive nights of trapping, when the animal is active above ground at night. During the trapping session, a total of 100 traps (five trap lines consisting of 20 traps) were set. The trap lines consisted of 12-inch, Sherman live traps placed 10 meters apart. Traps were placed in suitable habitat areas, concentrating on locating traps in areas containing sandy soils, relatively free of debris and containing suitable vegetation. Areas with kangaroo rat/small mammal sign (scat, burrows, tail drags) were also targeted. Each trap was baited with a mixture of bird seed and rolled oats placed at the back of the traps. The traps were set at dusk each night and inspected once during the night and at dawn each morning. All animals were identified and released unharmed at the point of capture. No SBKR were trapped over the course of the 5-night trapping survey. A detailed discussion of survey methodology can be found in the San Bernardino Kangaroo Rat Report prepared for the project and located in Appendix K of this BTR.

2.2 JURISDICTIONAL WETLAND AND WATERWAY DELINEATION SURVEY

HDR biologists Allegra Simmons and Sean Harris conducted a jurisdictional delineation survey for the proposed project in February 2012. The survey area extends 200 feet from the project centerline to capture jurisdictional features within and adjacent to the proposed project footprint. HDR biologists examined the project site to determine the limits of: (1) USACE jurisdiction pursuant to Section 404 of the Clean Water Act (CWA); and (2) California Department of Fish and Wildlife jurisdiction pursuant to Section 1600-1616 of the California Fish and Game Code. The site was evaluated in accordance with the 1987 USACE Wetland Delineation Manual (Environmental Laboratory, 1987), the 2008 Interim Regional Supplement to the USACE Wetland Delineation Manual: Arid West Supplement (Arid West Supplement) (USACE 2008a), the Regulatory Program CWA Guidance to Implement the U.S. Supreme Court Decision for the Rapanos and Carabell Cases (USACE 2008b) and the Field Guide to the Identification of the Ordinary High Water Mark (OHWM) on the Arid West Region of the United States (USACE 2008c). A detailed description of delineation methodology can be found in the Jurisdictional Delineation Report prepared for this project located in Appendix L.

2.3 LITERATURE SEARCH

Prior to surveying the survey area, background research was performed to identify any sensitive species that may occur within the survey area. This was conducted using the CNDDB RareFind Version 4 (CDFG 2012b), the USFWS website, the California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Vascular Plants (CNPS 2010B), and other pertinent scientific literature.

2.4 REGULATORY FRAMEWORK

2.4.1 FEDERAL

Federal Endangered Species Act

The federal ESA defines and lists *species* as "endangered" or "threatened" and provides regulatory protection for the listed species. The federal ESA provides a program for conservation and recovery of threatened and endangered species. It also ensures the conservation of designated critical habitat that the USFWS has determined is required for the survival and recovery of these listed species. Section 9 of the federal ESA prohibits the "Take" of species listed by USFWS as threatened or endangered. *Take* is defined as: "…to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." In recognition that *Take* cannot always be avoided, Section 10(a) of the federal ESA includes provisions for *Take* that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) permits (incidental take permits) may be issued if *Take* is incidental and does not jeopardize the survival and recovery of the species.

Section 7(a)(2) of the federal ESA requires that all federal agencies, including the USFWS, evaluate projects with respect to any species proposed for listing or already listed as endangered or threatened and any proposed or designated critical habitat for the species. Federal agencies must undertake programs for the conservation of endangered and threatened species and are prohibited from authorizing, funding, or carrying out any action that will jeopardize a listed species or destroy or modify its critical habitat.

As defined in the federal ESA, individuals, organizations, states, local governments, and other nonfederal entities are affected by the designation of critical habitat only if their actions occur on federal lands; require a federal permit, license, or other authorization; or involve federal funding (USFWS 2011).

The project does not occur within an approved Habitat Conservation Plan (HCP). Therefore, potential impacts to threatened or endangered species, as considered by the USFWS or CDFW, are not covered under an existing HCP. Consequently, should any listed species be detected during the associated focused species surveys, incidental take permits will need to be obtained.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 Code of Federal Regulations (C.F.R.) Part 10, including feathers, or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 C.F.R. 21). Sections 3505, 3503.5, and 3800 of the CDFG Code also prohibit the take, possession, or destruction of birds, their nests, or eggs.

Section 404 Permit (Clean Water Act)

The Clean Water Act establishes a program to regulate the discharge of dredge and fill material into waters of the U.S. including wetlands. Activities regulated under this program include fills for development, water resource projects (e.g., dams and levees), infrastructure development (e.g., highways and airports), and conversion of wetlands to uplands for farming and forestry. Either an individual 404b permit or authorization to use an existing USACE Nationwide Permit will need to be obtained if any portion of the construction requires fill into a river, stream, or stream bed that has been determined to be a jurisdictional waterway. When applying for a permit a company or organization must show that they would avoid wetlands when practicable, minimize wetland impacts, and provide compensation for any unavoidable destruction of wetlands (CWIS 2007).

Section 401 Water Quality Certification (Clean Water Act)

The Clean Water Act protects water quality by regulating the dumping or flow of pollutants into streams, lakes, and rivers. A water quality certification, obtainable through the State Water Resources Control

Board (SWRCB) and Regional Water Quality Control Boards (RWQCB), must be obtained in order to receive a 404 permit or be authorized under the 404 nationwide permits (USEPA 2011).

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 (42 United States Code Section 4321-4347) is a Federal statute requiring the identification and analysis of potential environmental effects associated with proposed Federal actions before those actions are taken. The intent of NEPA is to help decision makers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. The process for implementing NEPA is outlined in Title 40 of the Code of Federal Regulations (CFR), Parts 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.*

NEPA established the Council on Environmental Quality (CEQ) that was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. The CEQ regulations define major Federal actions to include adoption of official policy (i.e., rules and regulations), adoption of formal plans, adoption of programs, and approval of specific projects (40 CFR 1508.18). The CEQ regulations mandate that all Federal agencies use a prescribed structured approach to environmental impact analysis.

FTA is the federal lead agency under NEPA for the proposed project. As a federal agency, the FTA must meet NEPA requirements whenever it is the FTA's decision that would result in an impact on the human environment, even if the impact would be beneficial and regardless of who proposes the action or where it would take place (40 CFR 1508.18). FTA is requiring the preparation of an Environmental Impact Statement (EIS) for the Project to fulfill the requirements of NEPA.

2.4.2 STATE

California Endangered Species Act

The California ESA prohibits the *take* of listed species, except as otherwise provided in state law. The *take* for the California ESA is defined as it is in the federal ESA; however, unlike the federal ESA, the California ESA also applies the *take* prohibitions to species petitioned for listing as state candidates rather than only those listed species. State lead agencies are required to consult with the CDFW to ensure that any actions undertaken by the lead agency are not likely to jeopardize the continued existence of any state-listed species or result in destruction or degradation of required habitat. CDFW is authorized to enter into a Memorandum of Understanding (MOU) with individuals, public agencies, universities, zoological gardens, and scientific or educational institutions to import, export, take, or possess listed species for scientific, educational, or management purposes.

Due to the potential presence of state-listed rare, threatened, endangered, or candidate species within the proposed project area (e.g., least Bell's vireo, San Bernardino Kangaroo Rat, etc.), compliance with the California ESA was considered in the evaluation of the proposed project.

Section 2080 and 2081 of the State Fish and Game Code

Section 2080 of the State Fish and Game Code (Code) states:

> No person shall import into this state [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission [State Fish and Game Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter [Chapter 1.5, Endangered Species], or the Native Plant Protection Act, or the California Desert Native Plants Act (Justia 2010).

Pursuant to Section 2081 of the Code, the CDFW may authorize individuals or public agencies to import, export, take, or possess, any state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or MOUs: (1) if the *take* is incidental to an otherwise lawful activity, (2) if impacts of the authorized *take* are minimized and fully mitigated, (3) if the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and (4) if the applicant ensures adequate funding to implement the measures required by CDFW. CDFW shall make this determination based on available scientific information and shall include consideration of the ability of the species to survive and reproduce.

Due to the potential presence of state-listed rare, threatened, endangered, or candidate species within the proposed project area, Sections 2080 and 2081 of the Code were considered in the evaluation of the proposed project.

Sections 3503 and 3503.5 of the State Fish and Game Code

These sections of the Code provide regulatory protection to resident and migratory birds and all birds of prey within the State of California, including the prohibition of the taking of nests and eggs, unless otherwise provided for by the Code. Specifically, these sections of the Code make it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code.

Due to the presence of resident and migratory breeding birds within the proposed project area, Sections 3503 and 3503.5 of the Code were considered in the evaluation of the proposed project.

Sections 1600 to 1603 of the State Fish and Game Code

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California are subject to the regulatory authority of the CDFW pursuant to Sections 1600 through 1603 of the State Fish and Game Code (Code) and require preparation of a Streambed Alteration Agreement. Pursuant to the Code, a *stream* is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or wildlife, including all wild animals, birds, plants, fish, amphibians, invertebrates, reptiles, and related ecological communities, including the habitat upon which they depend for future viability. Based on this definition, a watercourse with surface or subsurface flows that support or have supported riparian vegetation is a stream and is subject to CDFW jurisdiction (CDFG 2004).

Altered or artificial waterways valuable to fish and wildlife are subject to CDFW jurisdiction. Due to the presence of ephemeral streams within the project area, Sections 1600 through 1603 of the Code were considered in the evaluation of the proposed project.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires state and local agencies to identify impacts to the environment that might be caused by their actions. Projects undertaken by public or private agencies must comply with this act if there is any approval given by a state agency (CEQA 2012). CEQA is a self-regulating statute; however, agencies that do not comply may face litigation from the public. CEQA is a statute that requires state agencies to provide information about environmental impacts of their actions and requires that actions be taken to avoid, minimize, or mitigate those impacts. All listed species are protected as well as candidates and those listed by the CNPS (Lists 1A, 1B, and 2) and CDFW (CEQA 2012). Any plants listed by the CNPS existing within the project area would be avoided to the extent possible. SANBAG is preparing an Environmental Impact Report (EIR) for the Project to comply with the requirements of CEQA.

2.4.3 LOCAL

The Cities of Redlands and San Bernardino have adopted tree protection ordinance to implement policies described in each City's respective General Plans. These ordinances apply to incorporated portions of each jurisdiction and include several native and non-native tree species. These species include, but are not limited to: oak, willow, cottonwood, walnut, citrus, and palm. The intent of these ordinances is to regulate the removal or disturbance of the trees within each city's jurisdiction.

City of San Bernardino Tree Ordinance

Section 19.28.090, Removal or Destruction of Trees, of the City of San Bernardino's municipal code discourages the removal of healthy, shade providing, and aesthetically valuable trees. More specifically, in the event that more than 5 trees are to be cut down, uprooted, destroyed or removed within a 36 month period, the City will require the securing of a tree removal.

City of Redlands Ordinance

Section 12.52.140, Work on Public Trees, of the Redlands Municipal Code requires that no person shall plant, chemically spray, fertilize, preserve, prune, remove, cut or otherwise disturb any public tree without first procuring a permit from the City. Additionally, Section 12.52.190, Protection of Trees During Improvements, of the Redlands Municipal Code requires that all trees on any street or other public place near any excavation or construction of any building, structure or street work, shall be guarded with a substantial fence, frame or box not less than four feet (4') high and eight feet (8') square, or at a distance in feet from the tree equal to the diameter of the trunk in inches at breast height, whichever is greater, and all building material, dirt or other debris shall be kept outside that barrier. Further, no person shall excavate any ditches, tunnels, trenches, or lay any driveway within a radius of ten feet (10') from any public tree without first obtaining a permit from the City (Ord. 2554 §1, 2004).

3.0 SURVEY RESULTS

The following discussion identifies biological resources (e.g., vegetation communities, botanical and zoological species, and jurisdictional areas) observed during the various biological surveys conducted for the project.

3.1 GENERAL BIOLOGICAL SURVEY

3.1.1 HABITAT TYPES/VEGETATION

Vegetation types or plant communities are assemblages of plant species that usually coexist in the same area. The classification of vegetation communities is based upon the life form of the dominant species within that community and the associated flora. Vegetation was classified using the R.F. Holland system of natural communities as described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Nomenclature follows Hickman (1993) and Roberts, et al. (2004). The survey area supports 15 distinct vegetation communities (Table 2); however, the predominant land cover was identified as being urban/developed. Two State-ranked sensitive vegetation communities occur within the survey area, southern cottonwood willow riparian forest and southern willow scrub. These communities are considered sensitive by the CDFW. The majority of the survey area is made up of paved roadways, man-made structures, adjacent lands that are unvegetated, and landscaped parcels. A vegetation communities map depicting the location of these communities is included as Appendix A, Figures 4a-4t.

Table 2. Existing Vegetation within the Project Survey Area

Vegetation Communities	Survey Area Acreage
Disturbed Habitat	24.50
Disturbed Wetland	0.02
Eucalyptus Woodland	2.78
Flat-top Buckwheat Scrub (disturbed)	0.91
Mulefat Scrub	0.04
Non-Jurisdictional Ditch	1.31
Non-Native Grassland	61.90
Non-Vegetated Channel	29.22
Oak Woodland	9.62
Orchard and Vineyards	5.28
Southern Cottonwood Willow Riparian Forest	8.21
Southern Willow Scrub	0.64
Tamarisk Scrub	0.47
Riversidean alluvial fan sage scrub	0.10
Urban/Developed	388.88
Total	**533.88**

Disturbed Habitat (Holland Code 11300)

Disturbed habitat (DH) is primarily used to identify areas of severe impacts to natural communities to the extent where it is no longer sustaining or functioning naturally. These areas have been previously physically disturbed, but continue to retain a soil substrate. Disturbed areas consist of predominantly non-native weedy and ruderal exotic species. This is not a natural community and generally does not provide habitat for wildlife or sensitive species. Examples of disturbed habitat include areas that have

been graded, cleared areas for fuel management, staging areas, off-road vehicle trails, and abandoned home sites.

Disturbed habitat in the survey area consists of abandoned staging areas, home sites, and parking areas, unpaved roads, and areas that have been graded, repeatedly cleared, and/or experienced repeated use that prevents natural revegetation (Appendix M, Photograph 1). Characteristic species include invasive, non-native forbs, such as prickly Russian-thistle/ tumbleweed (*Salsola tragus*), London rocket (*Sisymbrium irio*), fennel (*Foeniculum vulgare*). In addition, a limited amount of annual grasses typical of non-native grassland (42200) occur but do not dominate DH.

Disturbed Wetland (Holland Code 11200)

Disturbed Wetland (DW) is generally associated with areas of wetlands that have been disturbed in the past by clearing, grubbing, or mowing. The vegetation community has indicators of wetland species that have been disturbed and non-native species such as castor bean (*Ricinus communis*), giant reed grass (*Arundo donax*), pampas grass (*Cortaderia selloana*), and other invasive species.

Within the survey area, a small area of DW occurs along the northern portion of the streambed in Twin Creek just west of the existing railroad bridge. Vegetation is sparse and consists of young arroyo willow (*Salix lasiolepis*), mulefat (*Baccharis salicifolia*), Typha (*Typha* sp.), and water speedwell (*Veronica anagallis-aquatica*). Within the DW a significant amount of trash and debris has accumulated such as mattresses, clothing, and shopping carts (Appendix M, Photograph 2). There is evidence of vegetation maintenance (i.e., mowing) within the streambed. The DW does not connect upstream or downstream to wetland habitats.

Eucalyptus Woodland (Holland Code 11100)

Eucalyptus woodland (EW) is characterized by landscaped areas around homes or roadways. The primary indicator in EW is eucalyptus (*Eucalyptus* spp.), which is a non-native tree species from Australia. The understory is sparse and mostly dominated by leaf litter and weedy species including brome grasses.

Within the survey area, EW occurs adjacent to the SAR with individuals and smaller stands of Eucalyptus occurring throughout the survey area (Appendix M, Photograph 3).

Flat-top Buckwheat Scrub (Holland Code 37K00)

Flat-top buckwheat scrub (FBS) consists of a monoculture of successional vegetation that formally supported coastal sage scrub and chaparral in areas that experience continued disturbances. In the survey corridor this community is disturbed, however, it is dominated by flat-topped buckwheat (*Eriogonum fasciculatum*) and Wright's buckwheat (*Eriogonum wrightii)*, with the presence of other species. Other species that were present include annual brome grasses, fescue (*Vulpia* spp.), filaree (*Erodium* spp.), deerweed (*Lotus scoparius*), white sage (*Salvia apiana*), and ranchers fiddleneck (*Amsinckia menziesii* vars. *intermedia*).

Within the survey area, FBS occurs within a vacant lot located north of the railroad tracks adjacent to Warm Creek and east of D Street. This habitat is disturbed due to frequent mowing.

Mulefat Scrub (Holland Code 63310)

Mulefat scrub (MFS) is generally characterized by tall, herbaceous riparian scrub dominated by mulefat. This vegetation community is frequently flooded and absent floods this community would likely succeed to cottonwood- or sycamore-dominated riparian forest or woodlands.

Within the survey area this habitat occurs primarily within the SAR.

Non-native Grassland (Holland Code 42200)

Non-native grassland (NNG) is often associated with numerous species of wildflowers and a dense to sparse cover of annual grasses. Characteristic plant species of NNG include oat (*Avena* sp.), rip gut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), foxtail brome *(Bromus madritensis* ssp. *rubens)*, four-spot clarkia *(Clarkia purpurea)*, sierra shooting star (*Dodecatheon clevelandii*), and California melica (*Melica californica*).

NNG within the survey area is often disturbed and appears to have been previously irrigated and/or cultivated for agricultural purposes. Characteristics that comprise this attribute include the occurrence of previously open space between rows and these areas appear to be currently maintained.

Proposed Non-jurisdictional Ditch (no Holland Code)

Several proposed non-jurisdictional ditches (NJD) occur within the survey area. These ditches occur entirely within upland areas and are generally associated with the railroad ROW. These features are typically unvegetated, or vegetated with weedy ruderal species, and do not provide significant wildlife habitat. These features serve to drain road runoff from the ROW and are often connected through a series of culverts running parallel with the ROW.

Non-Vegetated Channel (Holland Code 64200)

Non-Vegetated Channel (NVC) consists primarily of engineered/leveed channels maintained by the SBCFCD or local municipality. The channels consist of a concrete, fine to coarse sandy or sandy cobbly substrate and are sparsely vegetated or unvegetated. Leveed banks consist of either concrete, concrete-covered cobble, or rock rip rap.

Within the SAR are small patchy areas of Riversidean Alluvial Fan Sage Scrub (RAFSS - Holland Code 32720), which includes scalebroom (*Lepidospartum squamatum*), broom matchweed (*Gutierrezia sarothrae*), and coastal goldenbush (*Isocoma menziesii*). These areas are considerably less than 15 percent vegetated and were therefore left out of the larger vegetation assessment[4].

Within the survey area, NVC occurs primarily in Warm Creek, and portions of Twin Creek (Appendix M, Photographs 2 and 5).

Oak Woodland (Holland Code 71100)

Oak woodland (OW) consists primarily of monotypic stands or various species of oak (*Quercus* sp.) with a poorly developed shrub layer, and well developed herbaceous layer generally dominated by grasses (*Bromes* spp.).

In the survey area this vegetation community consists of uniformly distributed scrub oak (*Quercus berberidifolia*) with an occasional live oak (*Quercus agrifolia*) and a disturbed understory made up of non-native grasses that appear to be maintained (Appendix M, Photograph 6). The area provides little habitat value due to the amount of disturbance and the surrounding land uses.

Orchard and Vineyards (Holland Code 18100)

Orchard and Vineyards (OV) occurs as an active orange grove located north of the ROW between California and Nevada Streets.

Southern Cottonwood Willow Riparian Forest (Holland Code 61330)

Tall, open, broad-leafed winter-deciduous riparian forests dominated by Fremont cottonwood (*Populus fremontii)* and several willow species (*Salix* spp). This habitat occurs in sub-irrigated and frequently overflowed lands along rivers and streams. The dominant species require moist, bare mineral soil for germination and establishment. The understory is generally vegetated by herbaceous and viney species such as sedges (*Carex* sp.), grape (*Vitis* sp.), and introduced wetland species.

[4] Isolated occurrences of RAFSS may occur within the NVC mapping unit and within the understory of the SCWRF and SWS mapping units.

Within the survey area, Southern cottonwood willow riparian forest (SCWRF) occurs primarily within the western portion of Mission Zanja Channel and within the SAR. SCWARF is a State-ranked S3.2 (threatened) sensitive habitat.

Southern Willow Scrub (Holland Code 63320)

Southern willow scrub (SWS) is usually made up of a dense thicket of various willow species (*Salix* spp.). This habitat occurs in loose, sandy alluvium near stream channels and is frequently flooded. The habitat is limited by the dense thicket of willows and frequent flooding which impacts the development of an understory.

Within the survey area, SWS occurs as small patches within the SAR and Twin Creek (Appendix M, Photographs 4 and 7). SWS is a State-ranked S2.1 (very threatened) sensitive habitat.

Riversidean alluvial fan sage scrub (Holland Code 32720)

RAFSS is a Mediterranean shrubland community that dominates washes, floodplains, and alluvial fans in southern California. Because alluvial fan sage scrub is characterized by its diversity, it can also be described as an intermediate between chaparral and sage scrub habitats, in that all three vegetation communities share similar floral components. However, the distinguishing factor is that alluvial fan sage scrub undergoes periodic scouring from frequent flooding events, creating three seral stages; pioneer, intermediate, and mature.

The study area contains disturbed intermediate RAFSS. This habitat generally occurs between the active flood channels and terraces of the Santa Ana River and is subjected to infrequent flooding events. Species composition onsite includes scalebroom (*Lepidospartum squamatum*), California buckwheat, brittlebush, matchweed (*Gutierrezia californica*), broom matchweed (*Gutierrezia sarothrae*), telegraph weed (*Heterotheca grandiflora*), coastal goldenbush (*Isocoma menziesii*), interior goldenbush (*Ericameria linearifolia*), hairy yerba santa (*Eriodictyon trichocalyx*), California sagebrush (*Artemisia californica*), Coastal prickly pear (*Opuntia littoralis*), valley cholla (*Opuntia parryi*), shrubby butterweed (*Senecio flaccidus*), and Our Lord's candle (*Yucca whipplei*). Soils are mainly gravelly, coarse alluvium with approximately 50 percent vegetative cover. RAFSS is a State-ranked S1.1 (very threatened) sensitive habitat.

Tamarisk Scrub (Holland Code 63810)

Tamarisk scrub (TS) is made up of almost a monoculture of any of several tamarisk (*Tamarix* spp.) species. This vegetation community is often associated with major disturbances in areas where native vegetation is being supplemented by tamarisk.

Within the survey area Tamarisk Scrub occurs in primarily within the SAR and the Mission Zanja Channel.

Urban/Developed (Holland Code 12000)

Urban/Developed (UD) land is comprised of areas of intensive use with much of the land constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. Developed land is highly modified and characterized by permanent or semi-permanent structures, pavement, unvegetated areas and landscaped areas that require irrigation.

Within the survey corridor, developed areas are comprised of paved roadways, man-made structures, adjacent lands that are unvegetated, or landscapes with a variety of ornamental (typically non-native/ exotic) plants (Appendix M, Photograph 8).

3.1.2 BOTANICAL RESOURCES

During the general biological and rare plant surveys conducted by HDR, all native and naturalized botanical species observed were recorded and are included in Appendix C. The species detected are representative of the vegetation communities located within the survey area. One individual sensitive plant (SAR woolly star, *Eriastrum densifolium* ssp. *sanctorum*) was observed onsite during rare plant surveys. This is discussed in detail in Section 4.1 of this report.

3.1.3 ZOOLOGICAL RESOURCES

Birds

A large diversity of birds were observed during the surveys that reflect an assemblage of typical species encountered in riparian habitats, southern willow scrub, oak woodland, non-native grasslands, disturbed areas, and urban habitats. A total of 62 species of birds were observed in the larger survey area during site surveys (Appendix D). Sensitive avifauna observed or with the potential to occur within the survey area is discussed in Sections 4.2 of this biological technical report.

Mammals

A total of 11 species of mammals were observed or detected in the survey area during the general biological survey and focused species surveys including: coyote (*Canis latrans*), raccoon (*Procyon lutor*), California ground squirrel (*Spermophilus beecheyi*), and desert cottontail (*Sylvilagus audubonii*) (Appendix D). These species are commonly found in the vegetation communities occurring within the survey area. Sensitive mammalian species observed or with the potential to occur within the survey area are discussed in Section 4.2, Sensitive Wildlife Species of this biological technical report.

Reptiles and Amphibians

Amphibian and reptilian species observed during the general biological survey are commonly found in local habitats. Amphibians detected during the surveys were associated with stream courses and riparian habitats encountered in the survey area. Two reptilian species and one amphibian species were observed within the survey area and include: western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), and Pacific tree frog (*Pseudacris regilla*) (Appendix D).

3.2 JURISDICTIONAL WETLAND AND WATERWAY DELINEATION SURVEY

A jurisdictional delineation was conducted to identify the limits of waters of the U.S., including wetlands, pursuant to the Clean Water Act and subject to USACE jurisdiction as well as wetlands and non-wetland waters subject to CDFW jurisdiction pursuant to Section 1600 of the Fish and Game Code. The following is a summary of the jurisdictional delineation conducted within the site, further detail of findings can be found in the delineation report prepared for the project and located in Appendix L. Appendix A, Figures 6a through 6t, (Preferred Project) and Figure 7 (Reduced Project) illustrate the USACE and CDFW jurisdictional areas within the survey area.

A total of five major offsite drainage features either cross or is located longitudinally to the rail corridor. The crossings from west to east are known as Warm Creek (Historic) [Bridge 1.1], Twin Creek [Bridge 2.2], SAR [Bridge 3.4], and Mill Creek Zanja [Bridge 9.4]. Mission Zanja Channel occurs adjacent and to the south of the railroad corridor from MP 3.5 to MP 6. The following is a description of these features.

Santa Ana River

The main drainage feature within the Santa Ana Watershed is the SAR which is approximately 96 miles long, with its major upstream tributaries, including Bear Creek and Mill Creak. Other tributaries just

downstream of the survey area include Lytle Creek originating in the San Gabriel Mountains and the San Jacinto River originating in the San Jacinto Mountains. The SAR bisects the survey area at MP 3.4 (or Bridge 3.4), which corresponds with approximately River Mile 28.62 (or Reach 4) (Appendix A, Figure 6g [Preferred Project]).

A portion of the SAR occurs within the survey area between Waterman and Tippecanoe Streets. The streambed consists primarily of unvegetated fine sandy substrate with some cobble and areas of raised vegetated bars/islands. The bars and islands are primarily dominated by willow (*Salix* sp.) scrub, cottonwood, and mulefat with some upland species occurring in the understory such as California sagebrush (*Artemisia californica*) and flat-top buckwheat (Appendix M, Photograph 9). Within the survey area the river is generally confined to the east and west by development or maintained (i.e., reinforced) floodplain. The northeastern and southeastern banks of the river are vegetated with cottonwood and willow scrub vegetation. The northwest portion of the river bank is leveed with concrete and metal mesh rip rap and the southwest bank supports a large stand of eucalyptus trees (Appendix M, Photograph 3). Off-road vehicles tracks are common within the unvegetated portion of the channel. Within the SAR are small patchy areas of Riversidean alluvial fan sage scrub (Holland Code 32720), which includes scalebroom (*Lepidospartum squamatum*), broom matchweed (*Gutierrezia sarothrae*), and coastal goldenbush (*Isocoma menziesii*). These areas are considerably less than 15 percent vegetated and where therefore left out of the larger vegetation assessment.

The portion of the SAR within the survey area supports an ephemeral flow regime. Ponded water was observed in the low points of the riverbed up to several weeks after winter and spring rains. However, during various biological surveys, the riverbed was generally observed to be dry. Within the survey area, the SAR supports federal waters of the U.S. and CDFW riparian and unvegetated streambed.

Mission Zanja Flood Control Channel

The Mission Zanja Flood Control Channel (Mission Zanja Channel) parallels the rail corridor to the south from its confluence with the SAR to approximately 1,000 feet west of California Street; a total distance of approximately 2.5 miles (Appendix A, Figure 6g-6m [Preferred Project]). The Mission Zanja Channel consists of an un-improved trapezoidal earthen channel with some segments supported by wire revetment (Appendix M, Photograph 10) and is maintained by SBCFCD, The western terminus of the channel (outlet into the SAR) supports dense native riparian vegetation and is heavily incised (15-20 feet) (Appendix M, Photograph 7). Trash and debris can be found throughout the channel.

Mission Zanja Channel is culverted where it is crossed by paved roads through the cities of Loma Linda and Redlands. The channel has been artificial levied to decrease the risk of flooding to near by communities as a result to surrounding urban encroachment. Due to the surrounding urbanization there are many storm water drains that discharge into the channel.

Within the survey area, Mission Zanja Channel is ephemeral and supports federal waters of the U.S. and CDFW riparian and unvegetated streambed.

Twin Creek

Twin Creek (also known as “East Twin Creek and Warm Creek Channel”) is a major channel that conveys flows from the Twin Creek Spreading Grounds in northern San Bernardino to its confluence with the SAR at the northeast quadrant of I-10/Interstate 215 (I-215) separation. Twin Creek is owned, operated, and maintained by the San Bernardino County Flood Control District (SBCFCD). According to USACE record drawings, Twin Creek consists of a 60-foot wide by 14-foot high rectangular concrete channel (RCC) through the survey area (Appendix A, Figure 6c and 6d (Preferred Project); Appendix M, Photograph 2). Further downstream, the channel transitions to an unimproved (earthen) 202-foot wide base trapezoidal channel (with 2 to 1 side slopes) prior to discharging into Reach 5 of the SAR. The portion crossing the rail corridor was constructed in 1958.

Twin Creek primarily occurs as a large, unvegetated, concrete-lined channel, with vertically incised banks, and flows northeast to southwest through the survey area. The southern portion of the creek occurring in the survey area transitions to a sandy substrate with steeply sloped concrete banks. The sandy streambed supports sparse wetland vegetation, primarily low herbaceous plants and early successional shrub (mulefat) and sapling tree species (*Salix* spp., *Populus fremontii*).

Within the survey area, Twin Creek is ephemeral and supports federal wetlands and waters of the U.S. and CDFW riparian and unvegetated streambed.

Warm Creek

Warm Creek extends from north of the City of Highland downstream to its confluence with the SAR at the southwest quadrant of the I-10/I-215 separation (Appendix A, Figure 6a (Preferred Project); Appendix M, Photograph 5). The East Twin and Warm Creek improvements constructed by the USACE in 1961 diverted most of the original flows to the SAR at a point 1.4 miles upstream of its original confluence, resulting in a rerouting of the portion of Warm Creek from about 5th Street south to Central Avenue. Hence, the remaining portion of the channel is referred to as Warm Creek (Historic) throughout the BTR. Currently, the City of San Bernardino owns, operates, and maintains Warm Creek (Historic).

Within the survey area, Warm Creek primarily occurs as a narrow, unvegetated, concrete-lined channel, with vertically incised banks, and flows north to south through the survey area. Warm Creek supports federal waters of the U.S. and CDFW unvegetated streambed.

Mill Creek Zanja

Mill Creek Zanja occurs within the survey area at MP 9.5 (Appendix A, Figure 6r and 6s (Preferred Project); Appendix M, Photograph 11). The ephemeral creek was originally built by Native Americans as a ditch for water supply in 1819. As the area developed, the use of the Mill Creek transformed from water supply to a flood control and drainage channel. The Mill Creek Zanja, from 9th Street to Mill Creek, is designated as a State and Federal Historic Structure. SBCFCD owns the portion of the Mill Creek upstream and downstream of the Survey area. Mill Creek is covered with grouted rip rap as it conveys flow under I-10 (east crossing). The creek supports sparse non-native vegetation, sandy substrate, riprap banks, and substantial urban trash and debris.

Within the survey area, Mill Creek Zanja is ephemeral and supports federal waters of the U.S. and CDFW unvegetated streambed.

3.2.1 NON-JURISDICTIONAL FEATURES

Throughout the survey area, storm water from adjacent urban areas is channeled into the railroad ROW and transported through a series of ditches (Appendix A, Figure 6a-6t (Preferred Project); Appendix M, Photograph 12). These features occur entirely within upland areas, exhibit indistinct or intermittent OHWM and do not support hydrophytic vegetation. Within the survey area there are 1.39 acres of proposed non-jurisdiction ditches. A summary of acreages by non-jurisdictional ditch is found in Appendix L, Table 2.

3.2.2 FEDERAL WETLANDS

Potential jurisdictional areas were field checked for the presence of an Ordinary OHWM, definable channels and/or wetland vegetation, soils and hydrology. Suspected wetland habitats within the survey area were evaluated using the methodology set forth in the USACE 1987 *Wetland Delineation Manual*[5] (Wetland Manual), Regional Supplement to the USACE *Wetland Delineation Manual: Arid West Region* (USACE 2008), and *A Field Guide to the Identification of the OHWM in the Arid West Region of the*

[5] Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1, U.S. Army Engineer Waterways Experimental Station, Vicksburg, Mississippi.

Western United States (USACE 2008b). Where distinct boundaries between wetland vegetation communities, those that are dominated by obligate species, and upland vegetation communities, those that are dominated by facultative upland or upland species, occurred, wetland limits were based upon vegetation mapping. Where the presence of wetlands was suggested by either hydrophytic vegetation or indicators of hydrology, a soil pit was established (Appendix A, Figures 6a-6t [Preferred Project]). In some instances, soil pits were not conducted even with the presence of the hydrophytic vegetation and hydrology, such as in the SAR and Mission Zanja Channel, because the presence of well drained sandy substrate would prohibit the development of hydric soils. Four soil pits were conducted within the survey area. The following is a summary of the results; soil data sheets can be found in the attached delineation report (Appendix L):

Soil Pit 1

Soil Pit 1 (SP1) was located in a depressional area located north of the railroad tracks (Appendix A, Figure 6h (Preferred Project); Appendix M, Photographs 13 and 14). The area is supported by stormwater runoff from the ROW and is located adjacent to Mission Zanja Channel. Hydrophytic vegetation is dominant at SP1 and includes: arroyo willow (FACW), Fremont cottonwood (FAC), mulefat (FAC), and desert wild grape (*Vitis girdiana*; FAC). SP1 soils supported a loam matrix of very dark brown (10YR 3/2) and exhibited redoximorphic concentrations of strong brown (7.5YR 5/6) within 25 percent of the soil matrix. Hydric soils were identified as redox depression (F8). Hydrologic indicators at SP1 included water-stained leaves and biotic crust. SP1 meets the criteria for wetlands.

Soil Pit 2

Soil Pit 2 (SP2) was located in a depressional area located north of SP1 and the railroad tracks on land owned and maintained by the City of Riverside (Appendix A, Figure 6h (Preferred Project); Appendix M, Photograph 15). The depressional area is supported by stormwater runoff from adjacent, industrially-zoned properties which flows south-southwest towards the railroad ROW and is obstructed by the existing track profile (Appendix M, Photograph 16). The area supports moderately dense cover of 50 percent tamarisk (*Tamarisk* sp.; FAC) and 15 percent Johnson grass (*Sorghum halipense*; FACU). Using both the hydrophytic dominance test and prevalence index worksheets, SP2 does not meet USACE hydrophytic vegetation criteria. SP2 supported a silty clay loam dusky red (2.5YR 3/2) matrix at 0-2 inches and a silty clay loam olive (5Y 4/3) matrix at 2-15 inches. Soils did not exhibit redoximorphic features. Soils were not determined to be hydric. Hydrologic indicators at SP2 included surface soil cracks and inundation on aerial imagery. SP2 does not meet the criteria for wetlands.

Soil Pit 3

Soil Pit 3 (SP3) was located on the northern side of the Twin Creek streambed (Appendix A, Figure 6d (Preferred Project); Appendix M, Photographs 2 and 17). Hydrophytic vegetation is dominant at SP1 and includes sparse coverage of mulefat (FAC) and Typha (*Typha* sp.; OBL). The area occurs at the transition from concrete-lined channel bottom to sandy substrate. This area is highly disturbed with a significant amount of urban trash and debris (Appendix M, Photograph 2). SP3 soils were inundated and had a hydrogen sulfide smell when agitated. Hydric soils were identified as redox hydrogen sulfide (A4). Hydrologic indicators at SP3 included surface water, saturation, water-stained leaves, and muck surface. SP3 meets the criteria for wetlands.

Soil Pit 4

Soil Pit 4 (SP4) was located on the southern side of the Twin Creek streambed (Appendix A, Figure 6d [Preferred Project]); Appendix M, Photograph 2). Hydrophytic vegetation is dominant at SP1 and includes: *Salix* sp. (FACW) and mulefat (FAC). Similar to SP3 area, SP4 occurs at the transition from concrete-lined channel bottom to sandy substrate and supports urban trash and debris (Appendix M, Photograph 2). SP4 soils were inundated and had a hydrogen sulfide smell when agitated. Hydric soils

were identified as redox hydrogen sulfide (A4). Hydrologic indicators at SP4 included saturation, water marks, water-stained leaves, inundation on aerial imagery, and muck surface. SP4 meets the criteria for wetlands.

In summary, the survey area primarily supports federal waters of the U.S. including several small areas of federal wetlands (Appendix A, Figures 6a-6t [Preferred Project]). Federal jurisdictional areas mapped within the survey area are summarized in Table 3 below.

Table 3. USACE Jurisdictional Areas within the Survey Area

Jurisdiction	Existing Acreage within the Survey Area
USACE Waters of the US*	16.70
USACE Wetlands**	0.05
Total	**16.75**
Proposed Non-Jurisdictional Ditch	1.39

* Includes DH, non-vegetated channel, southern willow scrub, and southern cottonwood willow riparian forest.
** Includes disturbed wetland, southern willow scrub, and southern cottonwood willow riparian forest.

3.2.3 WATERS OF THE STATE

All USACE jurisdictional drainages within the survey area are considered jurisdictional by the CDFW. CDFW jurisdiction is similar to that of USACE jurisdiction, but also extends to the top of the bank and encompasses riparian vegetation when present. CDFW jurisdictional areas occurring within the survey area are summarized in Table 4 and identified in Appendix A, Figure 6.

Table 4. CDFW Jurisdictional Areas within the Survey Area

Jurisdiction	Existing Acreage within the Survey Area
CDFW Riparian	8.77
CDFW Unvegetated Streambed*	29.84
Total	**38.61**
Proposed Non-jurisdictional Ditch	1.39

*This includes DH and non-vegetated channel.

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4.0 SENSITIVE BIOLOGICAL RESOURCES

This section documents the potential occurrence within the survey area of sensitive plant and animal species, sensitive natural communities, and wildlife dispersal corridors or linkages. Sensitive species are those recognized by the USFWS (or other federal agencies) and/or CDFW as sensitive due to their declining, limited, or threatened populations. Sensitive natural communities are defined by city ordinances.

4.1 SENSITIVE BOTANICAL SPECIES

Sensitive plants include those listed by USFWS and CDFW as threatened or endangered, candidates for listing by the USFWS and CDFW, and/or are considered sensitive by the CDFW and/or the CNPS. CNDDB record searches indicated 26 known occurrences of rare or sensitive botanical species within nine quadrangles surrounding the survey area (Appendix N). The following is a description of sensitive plant species with a moderate to high potential for occurring within the survey area. The majority of suitable habitat for sensitive plants is located within the SAR crossing. A list of all the sensitive plant species with potential for occurrence are identified in Appendix E.

4.1.1 FEDERALLY THREATENED AND ENDANGERED BOTANICAL SPECIES

The following federally and/or state listed botanical species have been identified as having a moderate to high potential to occur within the project and survey areas. In general, suitable habitat for these species is limited to portions of the survey area within close proximity to the SAR.

Santa Ana River woolly star (*Eriastrum densifolium ssp. sanctorum*)
Federal: Endangered
State: Endangered
CNPS List: 1B.1

The Santa Ana River Woolly Star is a perennial herb that is native to California at elevations of 298 to 2,001 feet (91 to 610 meters) above mean sea level. This species is associated with sandy or gravelly chaparral and coastal scrub (alluvial fan). This species blooms and is best surveyed for in May through September (CNPS 2010B).

Habitat for the federally endangered species occurs as sandy areas associated with all sandy-bottomed drainages located within the survey area (e.g., SAR, Warm Creek, Mission Zanja Channel, etc.) The species is known to occur upstream and downstream of where the SAR transects the survey area. The nearest elemental occurrence of this species is located within approximately 1,700 feet of the survey area. One individual was observed during the 2012 springtime rare plant survey located within approximately 50 feet of Bridge 3.4 in the SAR (Figure 4g [Preferred Project]).

Slender-horned spineflower (*Dodecahema leptoceras*)
Federal: Endangered
State: Endangered
CNPS List: 1B.1

The Slender-horned Spineflower is an annual herb that is native to California at elevations of 656 to 2,493 feet (200 to 760 meters) above mean sea level (Calflora 2010). This species is associated with sandy chaparral, cismontane woodland and coastal scrub (alluvial fan) (CNPS 2010B). This species blooms and is best surveyed for in April through June (CNPS 2010B).

Habitat for the federally endangered species occurs as sandy areas associated with all sandy-bottomed drainages located within the survey area (e.g., SAR, Warm Creek, Mission Zanja Channel, etc.) The species is known to occur upstream and downstream of where the SAR transects the survey area and upstream of the survey area in Warm Creek. CNDDB data indicate that there is one elemental occurrence

of this species within the survey area; however, this record was in 1983. Although moderately suitable habitat occurs within the survey area, this species was not observed during focused rare plant surveys.

4.1.2 STATE THREATENED, ENDANGERED AND SPECIES OF SPECIAL CONCERN

The following species are CNPS listed sensitive botanical species.

Smooth tarplant (*Centromadia pungens* ssp. *laevis*)
Federal: None
State: None
CNPS List: 1B.1

The Smooth tarplant is an annual herb that is native to California at elevations 0 to 2,099 feet (0 to 640 meters) above mean seal level. This species is associated with chenopod scrub, playas, riparian woodland, valley and foothill grassland, and meadows and seeps. This species blooms and is best surveyed for April through September (CNPS 2010B). CNDDB data indicate that there are elemental occurrences of this species within the survey area; however, the most recent record was in 1925. A single individual was observed within the survey corridor where the railroad tracks go under I-10 (the west crossing) during general biological surveys conducted in June and July, 2010. This species was not observed during 2012 focused rare plant surveys.

Salt spring checkerbloom (*Sidalcea neomexicana)*
Federal: None
State: None
CNPS List: 2.2

The Salt Spring checkerbloom is a perennial herb that is native to California and the western North America at elevations 49 to 5,019 feet (15 to 1,530 meters) above mean sea level. This species is associated with chaparral, coastal scrub, lower montane coniferous forest, mojavean desert scrub and playas. This species blooms and is best surveyed for March through June (CNPS 2010B). CNDDB data indicate that there is one record of elemental occurrence of this species within the survey area; however, no observation date is provided. Although moderately suitable habitat occurs within the survey area, this species was not observed during focused rare plant surveys.

4.2 SENSITIVE WILDLIFE SPECIES

Sensitive animals are species or subspecies listed as threatened, endangered, or being evaluated (proposed) for listing by the USFWS or by the CDFW, and/or are considered sensitive by the CDFW. A sensitive designation includes those listed as rare or of "Special Concern," and includes a number of migratory bird species protected under the MBTA. CNDDB record searches indicated 32 known occurrences of rare or sensitive zoological species within 9 quadrangles surrounding the survey area (Appendix N). Species not considered federally or state sensitive were eliminated from consideration.

4.2.1 FEDERAL THREATENED AND ENDANGERED SPECIES

Least Bell's vireo (*Vireo bellii pusillus*)
Federal: Endangered
State: Endangered

The least Bell's vireo historically occurred throughout California, from the coastal ranges, Central Valley, Sierra Nevada foothills, Owens Valley, Death Valley, Mojave Desert and northwestern Baja California (Matthews and Moseley 1990). In 1990, 80 percent of the U.S. population occurred along just five drainages: Santa Margarita River, Sweetwater River, San Luis Rey River, San Diego River and the SAR (Prado Basin) (Ehrlich et al. 1992).

Habitat for the LBV ranges from riparian, shrubland/chaparral, and woodland. LBV prefer dense brush, mesquite, willow-cottonwood forest, streamside thickets, and scrub oak in arid regions but often near water (AOU 1983). They often return to the same breeding territory in successive years and only make nests in shrubs or low trees usually averaging about 1 meter aboveground (Franzreb 1989). The loss of about 95 percent of the former U.S. range and the loss of breeding habitat due to agricultural, urban and commercial development, flood control, river channelization and cowbird parasitism have lead to a dramatic decline in population and distribution (1994 End. Sp. Tech. Bull. 19(5):12; Saul 1995, Greaves 1997) (Franzreb 1989).

The LBV usually has a clutch size of 3-5 with incubation lasting 14 days. The LBV eats almost exclusively insects, spiders, snails, fruits, and forages in dense brush and occasionally tree tops (Terres 1980, NGS 1983). This species was observed within the survey area during general biological surveys conducted in June and July 2012. During focused protocol surveys several LBV were detected. On April 16, 2012 a male was observed calling approximately 600 feet to the northeast of the bridge crossing along the eastern side of the river in the riparian scrub. This male was also observed again on April 27, 2012 and May 8, 2012. On April 27, 2012, another male was observed approximately 500 feet south of the bridge along the east bank in the riparian forest floodplain. GLA observed a pair of LBV displaying breeding behavior which was detected south of the railroad within the Mission Zanja Channel. Several single male LBV were also detected outside of the survey area. A single male LBV (LBV 1) was observed approximately 400 feet sound of the railroad crossing on June 1, 11, 25, and July 5, 2012. LBV 2 was a single male that was observed approximately 500 feet north of the bridge crossing on June 1 and June 11, 2012. LBV 3 was a male that was observed on June 11, 2012, approximately 600 feet south of the railroad crossing. LBV 3 arrived south of the project site, was observed briefly counter singing with LBV 1 and then flew back south out of the survey area.

Southwestern willow flycatcher (*Empidonax traillii extimus*)
Federal: Endangered
State: Endangered

The southwestern willow flycatcher breeds throughout the southwestern U.S. as far west as Texas and possibly northern Baja California. SWIFL typically nest in relatively dense riparian vegetation where surface water is present for part of the year, or soil moisture is high enough to maintain the appropriate vegetation characteristics. SWIFL breeding habitat is restricted to relatively dense growths of trees and shrubs in riparian ecosystems and can be composed of a single species of willow (*Salix* sp.) or a mixture of native and nonnative trees and shrubs (Bent 1960). Species decline is a result of destruction and fragmentation of riparian habitat by the way of dams, reservoirs, diversions, channelization, groundwater pumping, and mismanagement of livestock, recreational development and cowbird parasitism (USFWS 2002) (USFWS 2011).

SWIFL eat mainly insects (wasps, bees, flies, beetles, spittlebugs butterflies/moths and caterpillars) caught in flight while occasionally gleaning insects from foliage and berries (Bent 1960). breeding usually occurs from early June through the end of July with incubation of normally one brood lasting 12-15 days. The riparian scrub/forest habitat associated with the SAR and Mission Zanja Channel provides suitable breeding habitat for SWIFL. Habitat ranges from around 1,460 feet in elevation.

Suitable habitat for this species was observed in the surveys area during general biological surveys conducted in February 2012. Although suitable habitat for this species exists on site, no SWIFL were detected during the five protocol surveys within the project site (Appendix H).

San Bernardino kangaroo rat (*Dipodomys merriami parvus*)
Federal: Endangered
State: Species of Special Concern

The historical range of the San Bernardino kangaroo rat (SBKR) extends from the San Bernardino Valley in San Bernardino County to the Menifee Valley in Riverside County (Lidicker 1960). SBKR occur on sandy soils and sandy loam soils within relatively open vegetation, generally along rivers, streams and drainages. The habitat of the San Bernardino kangaroo rat is described as being confined to primary and secondary alluvial fan scrub habitats, with sandy soils deposited by fluvial (water) rather than eolian (wind) processes. Burrows are dug in loose soil, usually near or beneath shrubs. While the general habitat preference for the species is alluvial scrub, it mainly occurs in early and intermediate seral stages of this plant community (McKernan 1997).

The project site is within the historical range of SBKR. The USFWS (2008) has designated parts of the SAR as critical habitat for the species. CNDDB data indicate there is one record of elemental occurrence of this species within the survey area, this occurred in 1993. The disturbed and relatively undisturbed habitat that occurs where the project site intersects Warm Creek and the SAR are potential SBKR habitat. Elsewhere along the project site, the ROW does not contain floodplain and agricultural habitats that could support SBKR, and is separated from such habitats by urban development. Robust populations of SBKR are documented approximately 1 mile upstream of the survey area. According to recent surveys conducted in the vicinity of the Project, SBKR have recently (2010 and 2012) been located approximately 0.25 mile upstream of the SAR crossing.

The trapping results show that SBKR do not currently occupy habitat within the survey area (Appendix K). No SBKR were trapped over the course of the 5-night trapping survey.

Santa Ana sucker (*Catostomus santaaneae*)
Federal: Threatened
State: State Species of Concern

The Santa Ana sucker (SAS) is a small fish that occurs in the rivers, larger streams and tributaries in southern California and is believed that the species' historical occupancy varied depending on suitability and access to these different areas (USFWS 2000, p. 19686). Santa Ana sucker generally inhabits perennial streams that have water depths ranging from a few inches to several feet and water currents from slight to swift (Smith 1966, p. 57).

The Santa Ana sucker's population has declined due to habitat availability/modification as a result to surrounding urban encroachment. Modifications to the watershed such as diversions, dams and recharge basins along with the volume and flow rate of water are key factors that shape the watershed and impact the Santa Ana sucker population. The Santa Ana sucker has lost approximately 70 percent of its historic range in the SAR watershed and 75 percent of its historic range (USFWS 2000, pp. 19687-19688).
The project is located near the upstream edge of Unit 1 (SAR), Subunit 1B, in an area that is not currently occupied by Santa Ana sucker due to the barrier to upstream movement at La Cadena Drive. This area is not currently occupied by the species but provides transit of water and coarse materials downstream to occupied habitat. Downstream distance to occupied habitat from the SAR (Bridge 3.4) is approximately 2.25 miles. Based on these circumstances, no Santa Ana suckers are expected to occur within the survey area.

4.2.2 STATE THREATENED, ENDANGERED AND SPECIES OF SPECIAL CONCERN

Western spadefoot toad (*Spea hammondii*)
Federal: None
State: Species of Special Concern

The Western Spadefoot toad's range includes the Central Valley and bordering foothills of California and the Coast Ranges (south of San Francisco Bay) and extends southward into northwestern Baja California, Mexico (NatureServe 2009).

Since this species spends most of its time underground in burrows, the aboveground observations may not be appropriate criteria for determining estimated population density, range, and abundance. Recent scientific literature does not discuss population densities of western spadefoot toad. No vernal pools or open water were mapped or observed within the survey area. Appropriate breeding locations occur within the proposed project footprint among portions of disturbed wetlands, the Mission Zanja Channel, and other areas that have temporary or permanent water associated with them (Jennings and Hayes 1994; Stebbins 1972; Ruibal et al. 1969). No western spadefoot toads were observed within the survey area during 2012 surveys.

Species-specific surveys for western spadefoot toads were not conducted. For the purposes of this BTR, presence is assumed. Suitable habitat occurs in the Mission Zanja Channel, in portions of Twin Creek, and in some non-jurisdictional ditches.

Loggerhead shrike (*Lanius ludovicianus*)
Federal: None
State: Species of Special Concern

The loggerhead shrike has a breeding range that extends from central and southern Canada, throughout the continental U.S. and through most of Mexico. The loggerhead shrike is a permanent resident in California and breeds from as early as January or February to July (Shuford and Gardali 2008). Loggerhead Shrike is diurnal and their diet consists primarily of large insects, other invertebrates, small birds, lizards, frogs, and rodents (Fraser and Luukonen 1986). However diet varies with season and location (Terres 1980). Primary threats across the North America of the Loggerhead Shrike are habitat loss and degradation, pesticides and fragmentation (USFWS).

The loggerhead shrike is associated with grassland habitats throughout their annual cycle, although have shifted over time to include altered landscapes such as agricultural areas (USFWS). Loggerhead Shrikes often perch on poles, wires or fence posts. These elevated perches are used for hunting, pair maintenance, and territory advertisement (USFWS). An individual was observed during 2012 surveys foraging within the survey area in an open field adjacent to MP 5.5 (location of MP on Figure 5k, Impacts on Vegetation Communities [Preferred Project]). No additional loggerhead shrikes were observed during avian surveys of the survey area.

Western burrowing owl (*Athene cunicularis hypugaea*)
Federal: None
State: Species of Special Concern

Western burrowing owl has a broad distribution that includes open country throughout the Midwest, western United States, Texas, southern Florida, parts of central Canada, Mexico, and the drier regions of Central and South America. In southern California, the species is known to occur in lowlands over much of the region, particularly in agricultural areas. In California, the BUOW has been extirpated as a breeding species during the last 10-15 years from approximately 8 percent of its former range (Klute 2003). Primary threats across the North American range of the BUOW are habitat loss and fragmentation primarily due to intensive agricultural and urban development, and habitat degradation due to declines in populations of colonial burrowing mammals (Grant 1965, Konrad and Gilmer 1984, Ratcliff 1986, Haug

et al. 1993, Dundas and Jensen 1994/95, Rodriguez- Estrella et al. 1998, Sheffield 1997a, Dechant et al. 1999).

BUOW is primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity (Shuford and Gardali 2008, references found therein). The overriding characteristics of suitable habitat appear to be burrows for roosting and breeding and relatively short vegetation with only sparse shrubs and taller vegetation (Green and Anthony 1989, Haug et al. 1993). Owls in agricultural environments nest along roadsides and water conveyance structures (open canals, ditches, drains) surrounded by crops (DeSante et al. 2004, Rosenberg and Haley 2004). Burrowing Owls often nest near and under runways and associated structures (Thomsen 1971, Gervais et al. 2003). Individual Burrowing Owls have moderate to high site fidelity to general breeding areas, prairie dog colonies, and even to particular nest burrows (Klute 2003). Burrow fidelity has been reported in some areas; however, more frequently, Burrowing Owls reuse traditional breeding areas without necessarily using the same burrow (Haug et al. 1993, Dechant et al. 1999). Occupancy of suitable habitat can be verified at a site by observing owls during the spring and summer months or, alternatively, the presence of molted feathers, cast pellets, prey remains, eggshell fragments, or excrement (white wash) at or near a burrow entrance.

BUOW follow a crepuscular habit, being most active during the early morning and evening hours. Their diet consists predominantly of large insects and small rodents, but they will also take small birds, reptiles, amphibians, fish, scorpions, and other available prey.

Migratory individuals arrive on the breeding areas either singly or paired. Non-migratory owls retain pair bonds throughout the year (Haug et al. 1993). The breeding season for BUOW generally begins in the month of April.

Habitat Assessment

The habitat assessment for BUOW was conducted by HDR biologists Summer Adleberg and Aaron Newton and was conducted on February 7th and 8th, 2012. Weather was conducive for surveying with cloudy/clearing skies, temperatures ranging from 53 to 71 degrees Fahrenheit and a light winds (3-5 mph). The alignment was surveyed on foot to identify the potential suitable habitat. The survey area included the 500 foot buffer from the centerline of the alignment and extended for approximately nine miles.

Within the survey area there are both vacant parcels and stretches of streambed slope that occur adjacent to the ROW and are separated by developed urban land uses. Vacant parcels were organized into three categories, urbanized/disturbed, low potential and medium/high potential. The vacant parcels range from low potential to medium/high potential and are generally flat and mowed/disked, and with sparse ruderal vegetation (i.e., DH). Low potential habitats consisted of few small animal burrows on sandy soils with less then 30% vegetation covering. High potential habitats were comprised of uneven sandy soils with animal burrows and less then 30 percent vegetation. Both the low and high potential habitats have non-native grasses.

Protocol Survey

Four focused surveys were conducted between April 10 and July 11, 2012 (Appendix I). Survey methodology followed guidelines identified in the Staff Report on Burrowing Owl Mitigation prepared by the Department of Fish and Game on March 7, 2012 (CDFG 2012a). Per the guidelines, the project area and a 150-meter (500 foot) buffer surrounding the site were surveyed where appropriate habitat was found. No BUOW or their sign were observed within the survey area or within 500 feet (150-meters) of the project centerline. While the survey area supports open habitat, the lack of large burrows, other birds of prey, regularly mowed and disked fields, makeshift homeless camps, surrounding commercial/urban development and several feral cats have created less then ideal conditions to support high populations of burrowing owls and breeding/foraging habitat. Although moderately suitable habitat occurs within the

survey area, this species was not observed during focused surveys. However, an individual burrowing owl was observed in the western portion of the survey area on January 09, 2013 by HDR biologist Aaron Newton during a site inspection (Appendix A, Figure 4A). The burrowing owl was observed using a ground squirrel burrow located near the top of a large dirt berm. The berm occurs adjacent to the railroad tracks approximately 300 feet southwest of the intersection of E Street and West Rialto Avenue in the City of San Bernardino, CA. This area experiences heavy pedestrian traffic and is highly urbanized. However, the berm occurs within a moderately large undeveloped lot which provides marginal foraging habitat. The lot has been graded in the past, is partially covered by decomposing asphalt and is dominated by ruderal and non-native grass species. The burrowing owl was observed in an area that had been surveyed (with negative results) during 2012 focused protocol burrowing owl surveys. Based on the previous focused survey results, the individual is likely wintering on the site or passing through.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis)*
Federal: Candidate for listing
State: Species of Special Concern

The western yellow-billed cuckoo (WYBC) range extends from as far east as Montana to the north and Texas to the south. Primary threats to population declines are the loss, fragmentation, and alternation of native riparian habitat and pesticide use on breeding and wintering grounds (Gaines and Laymon 1984, Franzreb 1987, Laymon and Halterman 1987, Hughes 1999). WYBC require structurally complex riparian habitats with tall trees and dense woody vegetative understory (Halterman 1991, Hughes 1999). WYBC nest in dense riparian woodlands consisting of willows and cottonwoods (*Populus* spp.). Like populations of other riparian obligate species, WYBC populations have suffered sever range contraction during the last 80 years. The lower Colorado River area has seen an 80-90 percent decline in population between 1976 and 1986 (Laymon and Halterman 1987).

WYBC primarily eats large insects including caterpillars, cicadas and occasionally, small frogs and lizards (USFWS 2008). WYBC breeds throughout north Mexico, the United States, and southern Canada (Hughes 1999). Breeding season coincides with the emergence of cicadas and tent caterpillar (USFWS 2008).The riparian forest habitat associated with the SAR and Mission Zanja Channel provides suitable breeding habitat for WYBC. No WYBC were observed within the survey area during the general biological surveys or focused avian surveys.

Yellow-breasted chat (*Icteria virens*)
Federal: None
State: Species of Special Concern (Breeding)

The yellow-breasted chat breeds from southern British Columbia to south-central Baja California. Breeding yellow-breasted chats occupy early successional riparian habitats with a well-developed shrub layer and an open canopy. Breeding habitat is usually restricted to the narrow border of streams, creeks, sloughs, and rivers and seldom forms extensive tracts. Blackberry (*Rubus* spp.), wild grape (*Vitis* spp.), willow, and other plants that form dense thickets and tangles are frequently selected as nesting strata (Grinnell and Miller 1944). This species occurs in California as a migrant and summer resident primarily from late march to late September (Garrett and Dunn, 1981; Unitt, 2004) and breeds from late April through early August (Eckerle and Thompson, 2001; Unitt, 2004). Yellow-breasted chats feed predominantly on spiders, insects, wild fruits and berries (Shuford and Gardali 2008).

Suitable habitat occurs within the survey area, primarily along Mission Zanja Channel and the SAR. This species was not observed within the survey area (SAR and Mission Zanja Channel) during general biological surveys or focused avian surveys.

Yellow warbler (*Dendroica petechia*)
Federal: None
State: Species of Special Concern

The yellow warbler had a breeding range from Alaska across Canada and as far south as Panama. The yellow warbler is a migrant and summer resident in California from late March to early October and breeds from April to late July (Shuford and Gardali 2008). This species occupies riparian habitats with close proximity to water along streams and in wet meadows. They are commonly found in willows (*Salix* sp.), cottonwoods (*Populus* sp.), and a number of other riparian trees and shrubs (Shuford and Gardali 2008). The loss of riparian habitat combined with cowbird parasitism has resulted in threats to the species (Ehrlich et al. 1992).

Yellow warblers are invertivores, eating insects (especially caterpillars) and spiders while occasionally eating small fruits or probes in flowers (Lack 1976).Migratory individuals arrive on the breeding areas solitary and territorial in winter (Stiles and Skutch 1989, Greenberg and Salgado Ortiz 1994). Breeding occurs mainly in May-June but may continue into July or rarely August (NatureServe 2009). This species was observed within the survey area (SAR and Mission Zanja Channel) during general biological surveys conducted in February 2012 and during focused avian surveys.

4.2.3 MIGRATORY BIRDS

As previously discussed in Section 2.4.1, migratory birds are protected under the MBTA. Several migratory bird species were observed in the survey area and include: lesser goldfinch (*Carduelis psaltria*), Loggerhead shrike (*Lanius ludovicianus*), Yellow warbler (*Dendroica petechia*), bushtit (*Psaltriparus minimus*), and red-tailed hawk (*Buteo jamaicensis*) (Appendix D). Suitable habitat that would support breeding, roosting, and foraging migratory birds occurs throughout the survey area, on and off-site. Suitable habitat includes mature trees (>24-inch diameter), ornamental vegetation, utility poles, and building rafters and eves.

4.3 WILDLIFE DISPERSAL CORRIDORS OR LINKAGES

Wildlife movement corridors, also called dispersal corridors or landscape linkages, are linear features primarily connecting at least two significant habitat areas. Wildlife corridors and linkages are important features in the landscape, and the viability and quality of a corridor or linkage are dependent upon site-specific factors. Topography and vegetative cover are important factors for corridors and linkages. These factors should provide cover for both predator and prey species. They should direct animals to areas of contiguous open space or resources and away from humans and development. The corridor or linkage should be buffered from human encroachment and other disturbances (e.g., light, loud noises, domestic animals) associated with developed areas that have caused the habitat fragmentation (Schweiger et al. 2000). Wildlife corridors and linkages may function at various levels depending upon these factors and, as such, the most successful wildlife corridors and linkages will accommodate all or most of the necessary life requirements of predator and prey species.

The majority of the survey area occurs within an urban/developed area, except for a portion occurring within the SAR. Within the survey area, the SAR supports mature and successional riparian habitat which provides cover, breeding, and foraging habitat for wildlife species. In addition, the river functions as a wildlife corridor that connects the San Bernardino National Forest and Cleveland National Forest. Several other drainages transect the survey area, such as Twin Creek, Warm Creek, and the Mission Zanja Channel. However, these drainages are completely channelized, concrete-lined, and except for the lower 2,100 feet of the Mission Zanja Channel, they are nearly or entirely devoid of native vegetation. These drainages do not provide substantial cover, foraging, or breeding habitat for wildlife species. Although felids such as bobcat (*Lynx rufus*) and mountain lion (*Felis concolor*) were not observed directly there is a low potential for these species to occur along the SAR within the survey area.

5.0 IMPACT ASSESSMENT

5.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

The significance criteria for impacts to special status species are based on CEQA Guidelines (CEQA 2012). When determining significance of the effects of the proposed project, consideration was given to whether the project will have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a sensitive or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

Specifically, Section 15065(a) states that a project may have a significant effect where:

> *"The project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or wildlife community, reduce the number or restrict the range of an endangered, rare, or threatened species, ..."*

Appendix G of the 2012 State CEQA Guidelines indicate that a project may be deemed to have a significant effect on the environment if the project is likely to:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service (including protections provided pursuant to Section 1600 et seq.).

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

5.2 IMPACT ASSESSMENT METHODOLOGY

Impacts to biological resources from the project include construction and operational-related direct and indirect impacts (or adverse effects). Direct impacts are changes in the environment caused by the project that are immediately related to the project; they occur in the same time and place as the project (e.g., direct take, dust, noise, and heavy equipment traffic associated with construction of a project, etc.). Indirect impacts are changes in the environment that are not immediately related to the project but that are caused indirectly by the project and are reasonably foreseeable. Indirect impacts are changes to the

environment that occur later in time or farther removed in distance than direct impacts. Both direct and indirect impacts may be considered temporary or permanent depending upon the situation.

The impact analysis focuses on foreseeable changes to existing habitat conditions in the context of the significance criteria presented above for the preferred Project and Reduced Project Footprint Alternative. In conducting the following impact analysis for biological resources, three principal factors were taken into consideration when determining the significance of the project:

- Level of the impact (e.g., substantial/not substantial);
- Uniqueness of the affected resource (i.e., rarity of the resource); and
- Resource sensitivity.

The significance evaluation considers the interrelationship of these three components. For example, a relatively small magnitude impact to a state or federally listed species or associated habitat would be considered significant if the species is very rare and is believed to be very susceptible to disturbance (e.g., LBV). Conversely, common wildlife species found in urban areas are not rare or sensitive to disturbance. Therefore, a much larger magnitude of impact would be required to result in a significant impact.

5.3 DIRECT IMPACTS

5.3.1 SENSITIVE VEGETATION COMMUNITIES

Construction

Construction of the Project would involve direct impacts to existing vegetation communities within the project area both within and adjacent to the railroad corridor as a result of direct removal or disruption to root systems (Appendix A, Figures 4 and 5 (Preferred and Reduced Project, respectively). A vast majority of the direct impacts associated with construction would occur within existing urban/developed and disturbed habitats (see Table 5). However, direct impacts to sensitive vegetation communities, including SCWRF and SWS would also occur as a result of Project implementation (see Table 5). These abitats are concentrated between MP 3.3 and 4 of the railroad corridor. Of the 8.97 acres of sensitive vegetation communities[6] within the Survey area, a total of 0.62 acres would be impacted under the Preferred Project and the Reduced Project Footprint (see Table 5). Of these total areas, 0.55 acres would be permanently impacted under both the Preferred Project and Reduced Project Footprint. A complete breakdown of impacts can be found in Table 5. Based on these considerations, direct impacts to sensitive vegetation communities are considered significant prior to mitigation. Implementation of Mitigation Measure A would reduce direct impacts to less than significant levels.

Operations

Routine maintenance activities (e.g., vegetation clearing) along the railroad corridor would be required to maintain SANBAG's ROW free of obstructions between MP 3.3 and 4 over the long term operation of the Project. These activities would be limited to the existing ROW in order to maintain the track free of debris, including vegetation, and would not occur in adjacent sensitive habitats. As a result, no long-term conversion of adjacent sensitive habitat to non-sensitive habitat is expected and this direct impact is considered less than significant.

[6] Sensitive habitats includes the SCWRF, SWS, RAFSS, and DW vegetation classes.

Table 5. Direct Impacts to Vegetation Communities within the Survey Area

Vegetation Community	Existing Acreages	Preferred Project								Reduced Project Footprint (acres)	
		Proposed Layover		Design Option 1		Design Option 2		Design Option 3			
		T	P	T	P	T	P	T	P	T	P
Disturbed Habitat	24.50	2.02	4.35	2.02	9.66	2.02	4.35	2.02	4.35	1.77	4.35
Disturbed Wetland	0.02	0.02	--	0.02	--	0.02	--	0.02	--	0.02	--
Eucalyptus Woodland	2.78	0.25	0.12	0.25	0.12	0.25	0.12	0.25	0.12	0.25	0.12
Flat-top Buckwheat Scrub	0.91	0.02	--	0.02	--	0.02	--	0.02	--	0.02	--
Mulefat Scrub	0.04	--	--	--	--	--	--	--	--	--	--
Non Jurisdictional Ditch	1.31	0.12	1.12	0.12	1.12	0.12	1.12	0.12	1.12	0.12	1.12
Non-native Grassland	61.90	2.02	12.40	2.02	9.78	2.02	5.22	2.02	12.40	1.60	12.40
Non-vegetated Channel	29.22	12.4	0.52	12.4	0.52	12.18	0.52	12.4	0.52	10.32	0.52
Oak Woodland	9.62	--	0.00**	--	0.00**	--	0.00**	--	0.00**	--	0.00**
Orchard and Vineyards	5.28	0.44	0.91	0.44	0.91	0.44	0.91	0.44	0.91	0.01	0.40
Southern Cottonwood Willow Riparian Forest*	8.21	0.62	0.96	0.62	0.96	0.62	0.96	0.62	0.96	0.62	0.96
Southern Willow Scrub*	0.64	0.12	--	0.12	--	0.12	--	0.12	--	0.12	--
Riversidean alluvial fan sage scrub*	0.1	0.05	--	0.05	--	0.05	--	0.05	--	0.05	--
Tamarisk Scrub	0.47	--	--	--	--	--	--	--	--	--	--
Urban/ Developed	388.88	11.33	86.15	11.33	86.46	11.33	82.73	11.33	85.06	10.49	82.96
Total ***	***534***	***29***	***106***	***29***	***109***	***29***	***95***	***29***	***105***	***25***	***102***
Combined Total	**534**	**135**		**138**		**124**		**134**		**127**	

* Indicates the community is considered sensitive by CDFW based on a state (S) ranking from S1-S3. Southern cottonwood willow riparian scrub is ranked S3.2, southern willow scrub is ranked S2.1, and Riversidean alluvial fan sage scrub RAFSS is ranked S1.1.

**Impacts to Oak Woodland would be 0.002.

***Totals may not equal exactly due to rounding.

Note: T = Temporary; P = Permanent

5.3.2 SENSITIVE BOTANICAL SPECIES

Santa Ana River Woolly Star

Construction

Based on springtime rare plant surveys within the Survey area, a single federally endangered Santa Ana River woolly star was observed within the vicinity of the proposed improvements for Bridge 3.4 at the SAR (Appendix A, Figures 4g and 5g [Preferred and Reduced Projects, respectively]). The observed individual is located approximately 0.7 miles downstream from the closest, locally established population and, therefore, not considered part of a larger population in the survey area. The plant is located within the proposed temporary impact footprint and although construction crews would make every attempt to avoid the individual, construction activities associated with the installation of cofferdam (or CISS piles) carries a potential to directly impact the Santa Ana River woolly star individual. The potential for direct impacts to sensitive plant species occurs with both the Preferred and Reduced Project Alternatives and is considered significant prior to mitigation. Implementation of Mitigation Measures A, B, and G would reduce this direct impact to a less than significant level. Potential direct impacts would require consultation with USFWS pursuant to the ESA.

Operations

Future operations would be restricted to the existing railroad ROW with maintenance activities required to maintain the track free of debris, including vegetation. These activities would be restricted to SANBAG's ROW and would not extend into adjacent sensitive habitats. For this reason, the potential for direct impact is considered less than significant.

Smooth Tarplant

Although a single smooth tarplant was observed within the railroad ROW in 2010, the absence of the species in 2012 indicates that the railroad ROW does not support a significant population. Given that the Western Riverside County Multiple Species Habitat Conservation Area includes 6,700 acres of suitable habitat for the species and over 150 occurrences are known in the region, the loss of marginal suitable habitat associated with the project is considered less than significant (County of Riverside 2000, Regents of University of California 2010).

5.3.3 SENSITIVE ZOOLOGICAL SPECIES AND MIGRATORY BIRDS

Implementation of the Project would result in the potential to directly impact one or more special status species or suitable habitat for special status species during construction and long-term operation. These species include the federally and state endangered least Bell vireo, the federally and state endangered southwestern willow flycatcher, the federally endangered San Bernardino kangaroo rat, the federally threatened Santa Ana sucker, the yellow-billed cuckoo, which has been proposed for listing under the federal endangered species act, and the western burrowing owl, loggerhead shrike, yellow-breasted chat, yellow warbler, and western spadefoot toad designated as state species of concern. A discussion of potential adverse direct impacts for each species is provided below.

Federal and State Listed Species

Least Bell's Vireo

Construction

Several sensitive bird species were observed foraging within the survey area that would be subject to direct impacts from Project construction and include the federally endangered LBV. Four LBV territories (5 individuals; 4 males and 1 female) were mapped within the vicinity of the survey area of the SAR and the confluence of the Mission Zanja Channel with the SAR (Appendix A, Figures 4g and 5g [Preferred and Reduced Project, respectively]). Of these, one breeding pair of LBV were observed within the

Mission Zanja Channel, approximately 110 feet from the project centerline but outside of the direct impact footprint (Appendix A, Figures 4g and 5g [Preferred and Reduced Project, respectively]). The potential to directly impact these individuals occurs within both the Preferred and Reduced Project, although less suitable habitat would be directly impacted under the Reduced Project Footprint. Given that Project construction in the vicinity of the SAR and Mission Zanja Channel could occur year round, construction activities would coincide with the LBV breeding season (March 15-September 15). These direct impacts to LVB habitat are considered significant prior to mitigation. Implementation of Mitigation Measures A, B, C, and E would reduce direct impacts to less than significant levels and minimize the potential for direct take.

Operations

The Project would result in minimal physical disturbance to adjacent suitable habitat for LBV. The potential for direct impact is considered a less than significant.

Southwestern Willow Flycatcher

Construction

No SWIFL were observed within the survey area, therefore, direct impacts to this species are not likely. However, given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that SWIFL could occur within the Project area and be significantly impacted by construction. As a result, Mitigation Measure B is proposed to reduce this direct impact to a less than significant level.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for SWIFL. The potential for direct impact is considered less than significant.

San Bernardino Kangaroo Rat

Construction

Based on the completion of focused surveys for SBKR, no evidence of their presence was documented (see Appendix K). However, the survey area at the SAR overlaps with Unit 1 of designated SBKR critical habitat. Temporary impacts to 2.15 acres and permanent impacts to 0.70 acres of the 8,935 acres of the total designated SBKR critical habitat within Unit 1 would not result in an adverse modification to critical habitat as designated within this Unit 1. Furthermore, this Project will not change the hydrologic processes in any way that will contribute to further loss of primary constituent elements (PCEs) identified for SBKR within the SAR. However, given the duration of time prior to Project construction (2015) and the presence of marginally suitable habitat, it is possible that SBKR could take residence within the Project area and be impacted by Project construction. Direct impacts to the SBKR are considered significant and, as a result, Mitigation Measure B is proposed to reduce this direct impact to a less than significant level.

Operations

Once operational, the Project would not require additional direct impacts to the SAR, which is considered critical habitat for SBKR. Furthermore, this Project will not change the hydrologic processes within the Project area that could contribute to further loss of PCEs elements identified for SBKR within the SAR. For these reasons, long term operational direct impacts would be less than significant.

Santa Ana Sucker

Construction

Due to a number of barriers that occur downstream of the Project area in the vicinity of the SAR, there is no risk of direct take of individual SAS in conjunction with implementing the Project. Although the Project will not likely result in the loss of a federally listed species it would affect critical habitat through the disruption of the channel bed and banks. This would include the temporary placement of both the proposed bridge supports along side of the existing bridge supports until they can be removed. These effects would be temporary and are not expected to result in direct take of SAS and, therefore, the potential for direct impact is less than significant.

Operations

Based on hydraulic modeling, the proposed bridge supports at Bridge 3.4 are not anticipated to substantially alter sediment and water transport downstream (HDR 2012). Each bridge pile would be the same width as the existing piles but approximately 20 feet longer and, thus, oriented parallel to flow. The river channel under the new bridge would be widened, particularly on the north side, so that the five new piles would be in the channel. Hydraulic modeling shows that, relative to the existing bridge, the new bridge would result in a slightly lower water surface elevation and velocity during a 100-year flow event (HDR 2012). Thus, the new bridge supports would not impede water transport under the bridge nor would it change water surface elevations downstream of the bridge. Based on these considerations, the proposed design for both the Preferred Project and Reduced Project Footprint would not affect water or sediment transport downstream. Therefore, the potential for direct impact to SAS is less than significant.

Proposed for Federal Listing

Yellow billed cuckoo

Construction

No Yellow billed cuckoo were observed within the survey area, therefore, direct impacts to this species are not likely. However, given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that Yellow billed cuckoo could take residence within the Project area and be significantly impacted by Project construction. As a result, Mitigation Measure B is proposed to reduce this direct impact to a less than significant level.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for Yellow billed cuckoo. The potential for direct impacts to Yellow billed cuckoo are considered less than significant.

State Designated Species of Special Concern

Western Burrowing Owl

Construction

One individual wintering burrowing owl was observed onsite in January 2013, however, no evidence of breeding burrowing owl was detected within the survey area during 2012 focused protocol surveys. Given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that breeding and/or wintering BUOW could take residence within the Project area and be significantly impacted by Project construction. As a result, Mitigation Measures B and D are proposed to reduce this direct impact to a less than significant level.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for the BUOW. For this reason, the potential for direct impact to BUOW is considered less than significant.

Yellow warbler

Construction

Yellow warbler was observed during surveys and is known to occur in the vicinity of the Project area. Given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that yellow warbler breeding sites could be located within or adjacent to the footprint for either the Preferred Project or Reduced Project Footprint. If construction occurs during the breeding season (February 15-August 31), there is a potential for direct impacts (e.g., nest abandonment) to occur as a result of construction activities in the vicinity of the SAR and Mission Zanja Channel. Activities that may result in other impacts include, disturbing habitat adjacent to the impact footprint that supports sensitive avian species (i.e., SWS, SCWRF, etc.) to the extent that it does not recover and/or significantly decreases its value to wildlife, or destruction of an occupied nest (eggs or birds present). There is a high potential for nests to occur within these areas and, therefore, the potential for direct impacts to yellow warbler are considered significant prior to mitigation. Implementation of Mitigation Measures A and E would reduce impacts to less than significant levels. Yellow warbler is covered by the MTBA.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for the yellow warbler. The potential for direct impact is considered less than significant.

Loggerhead shrike

Construction

Loggerhead shrike is known to occur in the vicinity of the Project area. Given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that Loggerhead shrike breeding sites could be located within or adjacent to the footprint for either the Preferred Project or Reduced Project Footprint and construction occurs during the breeding season (February 15-August 31), there is potential direct impacts (e.g., nest abandonment) to occur as a result of construction activities; especially in the vicinity of the SAR and Mission Zanja Channel. Activities that may result in other impacts include, disturbing habitat adjacent to the impact footprint that supports sensitive avian species (i.e., SWS, SCWRF, etc.) to the extent that it does not recover and/or significantly decreases its value to wildlife, or destruction of an occupied nest (eggs or birds present). There is a high potential for nests to occur within these areas and, therefore, direct impacts to Loggerhead shrike are considered significant prior to mitigation. Implementation of Mitigation Measures A and E would reduce impacts to less than significant levels. Loggerhead shrike is covered by the MTBA.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for the Loggerhead shrike. The potential for direct impact is considered less than significant.

Yellow breasted chat

Construction

No Yellow breasted chat were observed within the survey area, therefore, direct impacts to this species are not likely. However, given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that Yellow breasted chat breeding sites could be located within or adjacent to the footprint for either the Preferred Project or Reduced Project Footprint and construction

occurs during the breeding season (February 15-August 31), there is potential direct impacts (e.g., nest abandonment) to occur as a result of construction activities; especially in the vicinity of the SAR and Mission Zanja Channel. Activities that may result in other impacts include, disturbing habitat adjacent to the impact footprint that supports sensitive avian species (i.e., SWS, SCWRF, etc.) to the extent that it does not recover and/or significantly decreases its value to wildlife, or destruction of an occupied nest (eggs or birds present). There is a high potential for nests to occur within these areas and, therefore, the potential for direct impacts to Yellow breasted chat are considered significant prior to mitigation. Implementation of Mitigation Measures A and E would reduce impacts to less than significant levels. Yellow breasted chat is covered by the MTBA.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for Yellow breasted chat. The potential for direct impact to is considered less than significant.

Western Spadefoot Toad

Construction

Presence of western spadefoot toad is assumed in the Mission Zanja Channel, Twin Creek, and some non-jurisdictional ditches. Both the Preferred and Reduced Project Alternatives could directly permanently impact individuals through physical interaction with construction equipment and potential sedimentary fill into breeding habitat. Pursuant to Appendix G IV (a) of the 2012 State CEQA Guidelines, impacts to western spadefoot toads are considered significant prior to mitigation. Implementation of Mitigation Measure B would reduce impacts to less than significant levels.

Operations

Once constructed, the Project would not require additional direct impacts to the SAR and the Mission Zanja Channel. For this reason, operational direct impacts would be less than significant.

5.3.4 USACE AND CDFW JURISDICTIONAL AREAS

The Project has the potential to result in substantial adverse effects to federal and state-protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to vernal pools and seasonal wetlands) through direct fill or excavation, hydrological interruption, or other indirect impacts (Appendix A, Figures 6 and 7 (Preferred and Reduced Projects, respectively). Implementation of the Project would result in direct and indirect impacts to waters of the U.S. (and State) as result of the placement of fill materials or excavation within jurisdictional waters of the U.S., including wetlands within the railroad corridor. A majority of the direct effects would occur in areas where the railroad ROW intersects with wetlands or other waters of the U.S. (e.g., SAR, Mission Zanja Channel, Mill Creek Zanja, etc.). Although SANBAG would to the maximum extent practical, route the track alignment and supporting subgrade improvements within portions of the ROW not containing wetlands, the possibility for the construction to temporarily or permanently impact wetlands or waters directly or indirectly is high given the number and frequency of potentially jurisdictional features. These impacts would be the most pronounced at the SAR (Bridge 3.4) and for track improvements that would parallel the Mission Zanja Channel. Pursuant to Appendix G IV (c) of the 2012 State CEQA Guidelines, impacts to USACE and CDFW jurisdictional areas are considered significant prior to mitigation. Implementation of Mitigation Measure G would reduce impacts to less than significant levels.

Construction

USACE Jurisdiction

Based on the physical footprint of the Preferred Project, total impacts to waters of the U.S., including wetlands, is estimated at 6.23 acres. Of this total, permanent impacts to USACE jurisdiction for the

Preferred Project are 0.30 acres with the remaining 5.93 acres subject to temporary impacts, of which 0.02 acres consists of disturbed wetlands (see Tables 6 and 7, Appendix A, Figure 6). Areas subject to temporary impacts would be revegetated consistent with USACE permit requirements. Areas permanently impacted would experience a permanent loss habitat, and therefore, compensatory mitigation would be required (see Tables 6 and 7). Total impacts to waters of the U.S., including wetlands, under the Reduced Project Footprint are estimated at 5.16 acres with up to 0.30 acres being permanently impacted and the remaining 4.86 acres being subject to temporary impacts (see Tables 6 and 7, Appendix A, Figure 7). All temporary impacts to USACE jurisdiction would be restored to existing contours and revegetated with appropriate native species ensuring no net loss of USACE jurisdiction. However, direct impacts to wetlands and waters of the U.S. that would be permanent are considered significant and implementation of Mitigation Measure F would be required to reduce the impact to a less than significant level.

Table 6. Permanent and Temporary Impacts to USACE Jurisdictional Areas within the Survey Area

Jurisdictional Resource	Existing (acres)	Temporary Impacts (acres)		Permanent Impacts (acres)		Total Impacts (acres)	
		Preferred Project*	Reduced Project	Preferred Project*	Reduced Project	Preferred Project	Reduced Project
Waters**	16.70	5.93	4.86	0.30	0.30	6.23	5.16
Wetlands	0.05	0.02	0.02	0.00	0.00	0.02	0.02
Total	**16.75**	**5.93**	**4.86**	**0.30**	**0.30**	**6.23**	**5.16**

*Permanent and temporary impacts identified for the Preferred Project would be identical to Design Options 1, 2, and 3.
**Waters includes Waters of the U.S. and Wetlands.

Table 7. Impacts to USACE and CDFW Jurisdictional Areas

Vegetation Type	USACE					CDFW				
	Existing (acres)	Preferred Project (acres)[1]		Reduced Project (acres)		Existing (acres)	Preferred Project (acres)[1]		Reduced Project (acres)	
		T	P	T	P		T	P	T	P
Disturbed Habitat	0.00	0.00	0.00	0.00	0.00	0.30	0.09	0.20	0.09	0.20
Disturbed Wetland	0.02	0.02	0.00	0.02	0.00	0.02	0.02	0.00	0.02	0.00
Eucalyptus Woodland	0.00	0.00	0.00	0.00	0.00	0.19	0.03	0.00	0.03	0.00
Non-vegetated Channel	14.86	5.74	0.19	4.69	0.16	29.14	12.40	0.50	10.32	0.50
Southern Cottonwood Willow Riparian Forest	1.60	0.09	0.05	0.09	0.05	7.92	0.57	0.93	0.57	0.93
Riversidean alluvial fan sage scrub	<0.00	0.00	0.00	0.00	0.00	0.10	0.05	0.00	0.05	0.00
Southern Willow Scrub	0.34	0.08	0.00	0.08	0.09	0.64	0.12	0.00	0.12	0.00
Total	**16.75**	***5.93***	***0.30***	***4.79***	***0.30***	**38.61**	***13.20***	***1.63***	***11.20***	***1.63***
Combined Total[3]		**6.23**		**5.09**			**14.92**		**12.83**	

[1]Permanent and temporary impacts identified for the Preferred Project would be identical to Design Options 1, 2, and 3.
[2]Temporary impacts to disturbed habitat are 0.002 ac for both the preferred and reduced project.
[3]The total does not add up to the sum of the above acreage because of rounding estimates

CDFW Jurisdiction

Construction of the Project would result in impacts to a total 14.92 acres of CDFW jurisdiction with permanent impacts occurring to up to 1.63 acres under the Preferred Project of which includes 0.50 acres of non-vegetated channel (Table 7). Temporary impacts to CDFW jurisdiction would occur on the remaining 13.20 acres of which includes 12.40 acres of non-vegetated channel (Table 7). Under the Reduced Project Footprint, up to 12.83 total acres of CDFW jurisdiction would be impacted with permanent impacts of up to 1.63 acres, which include 0.50 acres of non-vegetated channel (Table 7). Temporary impacts would occur within the remaining 11.20 acres, which includes 10.32 acres of non-vegetated channel (Table 7). These direct impacts would be significant and require the implementation of Mitigation Measure F to reduce the impact to a less than significant level.

Operational Impacts

Based on hydrologic analysis of the proposed improvements, including new bridge structures, no substantial changes in hydrology would occur that could otherwise impede water transport to existing wetlands or change water surface elevations in existing waterways (e.g., SAR). Over the longer term, vegetation clearing/trimming would be generally restricted to ROW. Although these activities could extend into adjacent jurisdictional areas that overlap with SANBAG's ROW (i.e., the SAR, Twin Creek, Mission Zanja Channel), permit conditions adopted by USACE and CDFW in conjunction with Mitigation Measure F prior to construction would minimize the potential for significant direct impacts to jurisdictional areas over the long-term operation of the project. With the implementation of Mitigation Measure F, direct impacts would be reduced to less than significant levels.

5.3.5 LOCAL ORDINANCES

Construction

Implementation of the Preferred and Reduced Project could result in the removal or disturbance of several species of trees including: willow, cottonwood, walnut, citrus, and palm as a result of grading, mitigation planting, road and trail development, and creation of impervious surfaces within and immediately adjacent to open space areas. The pruning and removal of protected trees within the Cities of San Bernardino and Redlands is permitted with appropriate authorization. The proposed project would include the preparation of a tree replacement plan for native and ornamental trees affected outside SANBAG's ROW consistent with local tree ordinances. Therefore, this direct impact is considered less than significant.

Operations

Once constructed, the Project would generally not require the removal of any additional trees. However, future maintenance activities would be required throughout the duration of Project operation and, therefore, limited pruning or vegetation clearing would be required to keep the railroad corridor free of debris. Vegetation maintenance activities would be limited to SANBAG's ROW and would not extend into adjacent sensitive habitats and, therefore, a less than significant impact would occur.

5.3.6 CORRIDORS AND LINKAGES

Construction

Construction activities are not likely to prohibit natural water and substrate transport or the ability of species to move upstream or downstream in the SAR or other waterways functioning as wildlife corridors and linkages. Construction activities will not interfere substantially within the movement of any resident or migratory fish or wildlife species or within established native, resident, or migratory wildlife corridors. As a result, impacts to fish and macroinvertebrate species would be less than significant.

Operations

The proposed bridge structures would continue to facilitate wildlife movement. Once operational, the Project would involve passenger train movement within the existing railroad ROW. Routine maintenance activities along the corridor could result in repeated disturbance over the life of the project. However, given the urbanized setting and narrow width of the railroad ROW, direct impacts would be unlikely to act as a barrier to wildlife movements. As a result, the Project is unlikely to cause habitat shifts (toward nonnative and/or disturbed type communities) or substantially degrade linkages, which may no longer provide food, cover, or ease of travel for many species. Based on these considerations, a less than significant impact would result.

5.3.7 HABITAT CONSERVATION PLANS

The survey area is not contained within an established HCP, Natural Communities Conservation Planning (NCCP), or other approved local, regional, or state habitat conservation plan. For this reason, a no conflict with an adopted HCP or NCCP would occur and, therefore, no impact would result.

5.4 INDIRECT IMPACTS

5.4.1 SENSITIVE VEGETATION COMMUNITIES

The type of indirect impacts on sensitive vegetation communities that could result in an impact to sensitive vegetation communities include sedimentation, changes in vegetation as a result of changes in land use and management practices, altered hydrology, habitat fragmentation, and the introduction of invasive species or noxious weeds from surrounding development. Any disturbance of adjacent sensitive vegetation to the extent that the habitat cannot recover and/or transitions to a non-sensitive habitat type would be considered a significant impact. Additionally, construction activities occurring adjacent to sensitive vegetation communities may result in temporary indirect impacts such as dust, erosion/sediment, and ground disturbance from the intrusion of workers and equipment. These indirect impacts to sensitive vegetation communities are considered significant. Implementation of Mitigation Measure A would reduce impacts to less than significant levels.

5.4.2 SENSITIVE BOTANICAL SPECIES

Based on springtime rare plant surveys within the Survey area, no additional special status plant species were observed within the Project area beyond the SAR individual woolly star that will be directly impacted by Project-related construction. Although no other populations were observed during the rare plant survey, given that Project construction would not start until 2015, there is a potential for one or more special status plants to inhabit the Project area, thereby, being subject to construction-related direct and indirect impacts. This impact is considered significant and Mitigation Measures A and B are proposed.

5.4.3 SENSITIVE ZOOLOGICAL SPECIES AND MIGRATORY BIRDS

Construction

As discussed above, protocol-level surveys only identified the presence of LBV. No other listed bird species were identified within suitable habitat. During construction of the Project, construction activities could produce noise levels that would adversely affect breeding LBV. USFWS typically applies a noise level criterion of 60 dBA Leq for assessing project-related noise effects to listed bird species. Therefore, depending on the type of equipment utilized near active LBV nests an indirect impact associated with construction-related noise could result. Implementation of Mitigation Measure C would minimize this indirect impact to a less than significant level.

Other indirect impacts to sensitive zoological species and migratory birds would generally be attributed to temporary construction-related dust and water quality effects. For example, hazardous materials leaks,

such as fuel, hydraulic fluid, and/or lubricants, from equipment working in or above the river channel, although unlikely, have a potential to contaminate dry or moist river bed sediments when no flow is present. This contamination, if not cleaned up immediately, could be transported downstream during higher flow events to critical habitat occupied by SBKR and SAS. Degradation of existing critical habitat functions and values would be considered a significant impact. However, implementation of project design features and BMPs identified in the Project SWPPP and National Pollutant Discharge Elimination System (NPDES) permit prepared for the Project would reduce impacts to water quality during construction to less than significant. Therefore, a less than significant impact is identified for this issue and no mitigation is proposed.

Construction of the new bridge at Bridge 3.4 would result in disturbances within the river channel and on the banks related to access, installation of temporary cofferdam(s) or CISS piles (or similar bridge structure type), dredging in the river bed and/or excavation along the banks, and removal of the cofferdam(s) or CISS piles (or similar bridge structure type) when construction is completed. Dredging and/or excavation of the river banks under the bridge to widen the channel would have the potential to cause suspension of fine sediments if the work occurs in flowing water or the disturbed soils later are exposed to flowing water before those soils are stabilize. Installation and removal of temporary cofferdam(s), CISS piles (or similar bridge structure type), and bridge support structures may result in temporary indirect impacts to downstream SAS critical habitat. However, eerosion and sedimentation into suitable habitat would be minimized through implementation of the SWPPP, such that temporary indirect impacts would be less than significant.

Operations

As discussed under project-related direct impacts, during operations the Project would result in minimal physical disturbance to adjacent suitable habitat and the potential for indirect impacts to sensitive zoological or bird species is considered low. For example, the potential for noise from passing trains to adversely affect breeding birds is very remote given the limited presence of suitable breeding habitat within the urbanized rail corridor and the infrequent and transient train movements past a given point. The potential for indirect impacts to sensitive zoological or bird species is considered less than significant.

5.4.4 USACE AND CDFW JURISDICTIONAL AREAS

USACE and CDFW jurisdictional areas occur within and adjacent to the Project area for the Preferred Project and Reduced Project Footprint Alternatives. Indirect impacts to these areas would mainly come in the form of indirect water quality impacts resulting from various construction activities. Pollutants of concern for jurisdictional areas include increases in sedimentation and the discharge of hazardous materials or debris during construction activities. To minimize falling debris during the construction of bridges across Warm Creek, Twin Creek, SAR, Mission Zanja Channel, and Mill Creek Zanja, a debris containment system would be installed under the bridges to prevent falling debris from entering jurisdictional areas.

Erosion and sedimentation and hazardous materials spill or leakage from construction vehicles is also considered a potential impact to jurisdictional areas. The use of petroleum products (e.g., fuels, oils, and lubricants) and erosion of cleared land during construction could potentially contaminate surface water. These activities would be required to adhere to the project SWPPP per the NPDES Construction Permit and the water quality certification issued by the Regional Water Quality Board (RWQCB, Santa Ana Region) per Mitigation Measure F. Mitigation Measure F reduces these potential impacts to a less than significant level.

Over the long-term, vegetation clearing/trimming is the primary operational activity that would occur within jurisdictional areas located within the ROW. Vegetation management would generally be confined to SANBAG's ROW and would not extend into adjacent sensitive habitat areas, which include

jurisdictional features (i.e., the SAR, Twin Creek, Mission Zanja Channel). Maintenance activities over the long term would generally be infrequent and limited in extent and, therefore, would be unlikely to result in indirect impacts to jurisdictional areas, such as changes in habitat due to clearing, disruption of sediments, and introduction of pollutants (i.e., oil, gas, lubricants, etc.). Indirect impacts to federal and state jurisdictional areas would be less than significant.

5.4.5 LOCAL ORDINANCES

The Project could result in the removal or disturbance of several species as a result of grading mitigation planting, road and trail development, and creation of impervious surfaces within and immediately adjacent to open space areas. These activities could result in indirect effects affecting the root systems of adjacent native and ornamental trees. Trenching, grading, soil compaction, placement of fill, impervious surfaces, irrigation, and landscaping within the drip lines of trees could lead to root damage ultimately resulting in death of the tree. Additional indirect impacts could result from the introduction of invasive species or noxious weeds, which could increase completion with existing native and ornamental species. The pruning and removal of protected trees within the Cities of San Bernardino and Redlands is permitted with appropriate authorization. The proposed project would include the preparation of a tree replacement plan for areas affected outside SANBAG's ROW consistent with local tree ordinances. Therefore, this indirect impact is considered less than significant.

5.4.6 CORRIDORS AND LINKAGES

Construction and operational activities would not prohibit the movement of native resident or migratory fish or wildlife species through existing wildlife corridors such as the SAR and Twin Creek. Project-related improvements would not result in permanent or temporary indirect impacts such as substantial blockage or significant change in existing habitat or type within the SAR or Twin Creek and a less than significant impact would result.

5.4.7 HABITAT CONSERVATION PLANS

The proposed project does not occur within an established HCP, NCCP, or other approved local, regional, or state habitat conservation plan and, therefore, no impact would result.

5.5 CUMULATIVE IMPACTS

Numerous other projects, independent of the RPRP, would occur within an approximately five mile radius of the Project area. The projects range from private development to road improvements, to Flood Control Facility improvements. Different portions of the Project Alternatives and Design Options would be developed on, and affect, different geographical areas within the RPRP Survey area. These effects could combine with other projects adjacent to and outside the RPRP Survey area. For this reason, the cumulative analysis considers a broader geographic context for each resource considered (e.g., Santa Ana Watershed for wetlands). The following is a discussion of cumulative impacts to biological resources potentially resulting from implementation of the Project and other projects within the defined geographical area.

Although implementation of the Project (Preferred or Reduced) would not result in significant impacts to biological resources, it would result in impacts that would be mitigated to below a level of significance. From a cumulative perspective, a majority of the projects considered would occur entirely within upland urban areas and would not result in impacts to biological resources. Rather, there are three main projects in the vicinity of the Project area that are anticipated to potentially impact biological resources based on their location: (1) Long-Term Maintenance of Flood Control and Transportation Facilities throughout San Bernardino County; (2) Mountain View Bridge over Santa Ana River; and (3) Mountain View Ave. Bridge at Mission Creek Channel. The potential for cumulative impacts is discussed further below under each of the following resource headings.

Sensitive Vegetation Communities

Implementation of the Project (Preferred Project and Reduced Project Footprint Alternative) would result in impacts to sensitive vegetation communities such as SWS, SCWRF, and NVC as a result of bridge replacements, track improvements, and reinforcement of adjacent flood control channels within Mission Zanja Channel. Implementation of other cumulative projects are anticipated to result in similar impacts to sensitive vegetation communities associated with the SAR and local flood control facilities (i.e., Twin Creek, Warm Creek, etc.). Absent mitigation, cumulative impacts to sensitive vegetation communities resulting from implementation of the Proposed Project and several local projects would be considered a significant loss to valuable habitat for biological resources. However, the Project would mitigate for impacts to sensitive vegetation communities through the implementation of Mitigation Measures A, C, and F, which would result in a no net loss to these resources. As a result, no cumulatively considerable impact would occur.

Sensitive Botanical Species

Implementation of the Project (Preferred Project and Reduced Project Footprint Alternative) would result in an impact to one individual of the federally endangered Santa Ana River woolly star located south of the existing Bridge 3.4 located in the SAR. This individual is the only sensitive plant observed within the Project area and is not part of a larger population. The nearest population of Santa Ana River woolly star is located approximately 0.7 miles upstream of the survey area in the SAR. Impacts to the one individual of woolly star would not be considered a cumulatively considerable effect as it is not part of a larger population.

Sensitive Zoological Species

Implementation of the Proposed Project (Preferred Project and Reduced Project Footprint Alternative) would result in impacts to SWS and SCWARF, which are habitats that support the federally endangered LBV, SWIFL and other sensitive avian species such as yellow warbler and those protected under MBTA. In addition, the Proposed Project could potentially impact suitable habitat for State Species of Concern, western spadefoot toad and burrowing owl.

Degradation of wildlife habitat caused by the Project, when combined with other habitat impacts occurring from other water resource, infrastructure, and development within the region, could result in significant cumulative impacts. However, the implementation of Project-specific measures identified in the project-level analysis to mitigate impacts on biological resources. As a result, implementation of Mitigation Measures A, B, C, D, and E are required to reduce impacts to less than significant levels and to minimize the potential for cumulatively considerable impact to special status species.

State and Federal Jurisdictional Areas

As summarized in Tables 6 through 8, Project implementation would permanently and temporarily impact state and federal jurisdictional areas. Permanent impacts to USACE (Preferred-0.41 ac; Reduced-0.21 ac) and CDFW jurisdictional areas (Preferred and Reduced-1.34 acres) would occur primarily within the SAR, Mission Zanja Channel, Twin Creek and Warm Creek as a result of bridge replacement and bank stabilization/armoring. Direct and indirect impacts to jurisdictional areas would be mitigated to less than significant levels through the implementation of Mitigation Measures F along with any additional measures established during the permitting process. However, the Proposed Project would not result in a net-loss of jurisdictional areas and through project design features and mitigation measures, would not significantly impact these resources. In considering that other cumulative projects would be subject to similar mitigation and regional enforcement by USACE's "no-net-loss" standard, the long-term viability of these resources would not be substantially diminished and, therefore, no cumulative considerable impacts would occur.

Local Ordinances

The Proposed Project would comply with local ordinances tree ordinances. Although other projects may result in cumulative impacts to native and ornamental trees, implementation of these projects would be required to adhere to local tree ordinances and, therefore, would not add to a cumulatively considerable impact to local native and ornamental tree resources.

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6.0 MITIGATION MEASURES

Measure A. Protection of Sensitive Plants and Habitats. SANBAG's shall require the construction contractor to implement the following measures to protect sensitive plants and habitats during project-related construction.

1. SANBAG shall designate an approved biologist (project biologist) who will be responsible for overseeing compliance with protective measures for the biological resources during clearing and work activities within and adjacent to areas of native habitat. The project biologist will be familiar with the local habitats, plants, and wildlife and maintain communications with the contractor to ensure that issues relating to biological resources are appropriately and lawfully managed. The project biologist will review final plans, designate areas that need temporary fencing, and monitor construction. The biologist will monitor activities within designated areas during critical times such as vegetation removal, the installation of Best Management Practices (BMPs) and fencing to protect native species, and ensure that all avoidance and minimization measures are properly constructed and followed.

2. Project employees and contractors that will be on-site shall complete environmental worker-awareness training conducted by the project biologist. The training will advise workers of potential impacts to the sensitive habitat and listed species and the potential penalties for impacts to such habitat and species. At a minimum, the program will include the following topics: occurrences of the listed species and sensitive vegetation communities in the area, a physical description and their general ecology, sensitivity of the species to human activities, legal protection afforded these species, penalties for violations of Federal and State laws, reporting requirements, and work features designed to reduce the impacts to these species; and to the extent practicable, promote continued successful occupation of areas adjacent to the work footprint. Included in this program will be color photos of the listed species, which will be shown to the employees. Following the education program, the photos will be posted in the contractor and resident engineer's office, where they will remain through the duration of the work. Photos of the habitat in which sensitive species are found will also be posted on-site. The contractor will be required to provide SANBAG with evidence of the employee training (e.g., sign in sheet or stickers) upon request. Employees and contractors will be instructed to immediately notify the project biologist of any incidents, such as construction vehicles that move outside of the work area boundary. The project biologist will be responsible for notifying the USFWS within 72 hours of any similar incident.

3. Prior to construction, SANBAG shall delineate the construction area (including staging and laydown areas) between Mile Posts 3.3 and 4.0 and erect exclusionary construction fencing along the perimeter of the identified construction area to protect adjacent sensitive habitats (SWS, SCWRF and Santa Ana woolly star). Limits of the exclusionary fencing shall be confirmed by the project biologist prior to habitat clearing. Exclusionary fencing shall be maintained throughout the duration of construction work from Mile Posts 3.3 to 4.0. Exclusionary fencing can be removed at the conclusion of construction work as approved by the project biologist.

   All construction-related vehicles and equipment storage shall occur in the construction area and/or previously disturbed areas as approved by the project biologist. Project-related vehicle traffic shall be restricted to established roads, construction areas, storage areas, and staging and parking areas.

   If construction activity extends beyond the exclusionary fencing into sensitive vegetation communities, areas of disturbance shall be quantified and an appropriate restoration approach shall developed in consultation with USFWS and CDFW. For example, if construction extends

beyond the limits of the exclusionary fencing, temporarily disturbed areas shall be restored to the natural (preconstruction) conditions, which may include the following: salvage and stockpiling of topsoil, re-grading of disturbed sites with salvaged topsoil, and re-vegetation with native locally available species.

Measure B. Pre-Construction Survey. Prior to construction, a qualified biologist retained by SANBAG shall conduct pre-construction surveys for special status plant species including Santa Ana River woolly star, slender-horned spineflower, smooth tarplant, and salt spring checkerbloom. Pre-construction surveys will also be required for special status wildlife species including least Bell's vireo, southwestern willow flycatcher, San Bernardino kangaroo rat, yellow-billed cuckoo, burrowing owl, and western spadefoot toad to verify presence or absence in the Project area. If one or more species are detected, then SANBAG shall consult with the USFWS (and/or CDFW if appropriate) to develop additional minimization measures prior to project construction (if necessary). These additional measures may include construction timing restrictions and/or construction monitoring.

Measure C. Least Bells Vireo (LBV). The following measures will be implemented to minimize direct impacts to LBV during construction:

1. Clearing and grubbing will be timed to avoid the breeding season of the least Bell's vireo (March 15 to September 15), unless SANBAG provides survey documentation to USFWS that confirms the riparian habitat in not occupied by LBV.
2. If active LBV nests are identified during pre-construction surveys and noise levels at the nest exceed 60 dBA Leq, noise attenuation structures will be placed or other noise attenuation measures (e.g., reducing the number of construction vehicles or using different types of construction vehicles) will be implemented to reduce noise levels at the nest to 60 dBA Leq (or ambient noise level if greater than 60 dBA Leq). During construction adjacent to these areas, noise monitoring shall occur during the LBV breeding season and be reported daily to USFWS. Construction activities that create noise in excess of the aforementioned levels will cease operation until effective noise attenuation measures are in place to the extent practicable.
3. Permanent impacts associated with clearing Southern Cottonwood Willow Riparian Forest (SCWRF) and Southern Willow Scrub (SWS) will be completed outside of the LBV and general avian breeding season to avoid direct impacts to these species.
    a. Temporary direct impacts to LBV habitat (SCWRF and SWS) shall be satisfied through in-kind habitat restoration, where appropriate, at a ratio of 1:1.
    b. Permanent impacts to LBV habitat (SCWRF and SWS), shall occur at a ratio of 3:1 through the purchase of mitigation credits from an approved habitat bank and/or habitat creation and restoration at a location to be determined on- and/or off-site.

Measure D. Burrowing Owl. SANBAG will conduct take avoidance (pre-construction) surveys for burrowing owl no more than 30 days and no less than 14 days prior to initiating ground disturbance activities.

1. If burrowing owl is identified during the breeding season (February 1 through August 31) then an appropriate buffer will be established by the biological monitor in accordance with the 2012 *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). Construction within the buffer will be avoided until a qualified biologist determines that burrowing owl is no longer present or until young have fledged and a CDFW-approved exclusion plan has been implemented. In addition to avoidance of the occupied habitat, off-site mitigation will be provided as described below:
    a. Replacement of occupied habitat with occupied habitat: 1.5 times 6.5 (9.75) acres per pair or single bird.

b. Replacement of occupied habitat with habitat contiguous to currently occupied habitat: 2 times 6.5 (13.0) acres per pair or single bird.

c. Replacement of occupied habitat with suitable unoccupied habitat: 3 times 6.5 (19.5) acres per pair or single bird.

2. If burrowing owl is identified during the non-breeding season (September 1 through January 31), then a 50 meter buffer will be established by the biological monitor. Construction within the buffer will be avoided until a qualified biologist determines that burrowing owl is no longer present or until a CDFW-approved exclusion plan has been implemented.

Measure E. MBTA Covered Species. Prior to habitat removal during the avian breeding season (February 15-August 31), a qualified biologist shall conduct a pre-construction nest survey (in suitable areas) for migratory birds within 10 days of construction. Should an active nest of any MBTA covered species occur within or adjacent to the project impact area, a 100-foot buffer (300 feet for raptors) shall be established around the nest and no construction shall occur within this area until a qualified biologist determines the nest is no longer active or the young have fledged.

Measure F. Clean Water Act Section 401 and 404 Permits and CDFW 1602 Streambed Alteration Agreement. Before the approval of grading or other ground disturbing activities within 50 feet of jurisdictional areas, SANBAG shall obtain a CWA Section 404 permit, Section 401 water quality certification, and CDFW 1602 Streambed Alteration Agreement.

As part of the Section 404 permitting process, if the USACE (and/or CDFW) requires compensatory mitigation, a draft wetland mitigation and monitoring plan (MMP) shall be developed for the selected Build Alternative. The MMP shall be consistent with USACE's and EPA's April 10, 2008 Final Rule for Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Parts 325 and 332 and 40 CFR Part 230).

Potential mitigation for impacts to federal and state jurisdictional areas may occur at the following ratios:

1. USACE Wetland
   - Permanent: 3:1
   - Temporary: restoration (in-kind)
2. USACE Waters
   - Permanent: 1:1
   - Temporary: restoration (in-kind)
3. CDFW Riparian
   - Permanent: 3:1 (SWS and SCWRF)
   - Permanent: 1:1 (unvegetated stream bank)
   - Temporary: restoration (in-kind)

Measure G. Reseeding for Wooly Star. Seeds from the impacted woolly-star plant shall be collected in the fall prior to construction of the SAR crossing. If construction activities require the loss of the single wooly-star at the SAR crossing, the collected seeds will be broadcast in the temporary impact areas, near the impacted woolly-star plant, after construction activities are complete and soils have been restored to pre-Project contours.

a. Seed collection and broadcast methodologies will be proposed by a qualified seed collector approved by the Service prior to seed collection in a Santa Ana Woolly-Star Management Plan.

b. Seed harvest shall be limited to no more than 50 percent of the available seeds from any one woolly-star plant.

c. Seeds shall be held at the appropriate temperature and humidity for the shortest length of time necessary prior to planting.

d. Planting of seeds shall be coordinated to occur prior to the first rains of the season, typically during early fall.

e. If the woolly-star plant known in the Project area is avoided, collected seeds will be hand broadcast near the parental plants.

7.0 CONSULTATION AND COORDINATION

Updates to this Revised BTR are in response to comments received by USFWS, CDFW, and USACE on the draft BTR and draft Biological Assessment. Coordination and consultation activities that have been under taken as part of the proposed project.

- May 1, 2013. FTA (and SANBAG) sent a letter to the U. S. Fish and Wildlife Service (USFWS) on May 1, 2013 requesting to initiate formal Section 7 Consultation for direct and indirect Project-related impacts to habitat occupied by federally listed species and federally designated critical habitat (see Section 3.7, Biological Resources and Appendix I4).
- July 15, 2013. SANBAG, CDFW, and USFWS conducted a field walk on to go over the Project features proposed by SANBAG and observe habitats adjacent to the ROW that may be affected by construction activities, including those at the Santa Ana River.
- August 9, 2013. USFWS forwarded a letter requesting additional information in order to complete the initiation package, including concurrence from the U. S. Army Corps of Engineers (USACE) that FTA will act as the lead Federal agency for the Section 7 Consultation process.
- December 12, 2013. FTA provided USFWS with a letter requesting initiation of Section 7 consultation. The letter also included information requested in USFWS's August 9, 2013 letter, including a draft BA (Appendix I3) for USFWS's review and concurrence.
- January 31, 2014, USFWS issued a letter indicating that formal Section 7 Consultation for the Project started on January 7, 2014 and that USFWS would issue a biological opinion within 135 days (see Appendix I4).
- May 13, 2014. USFWS requested and was granted a 60-day extension until July 21, 2014. An additional request for a subsequent 30-day extension to August 21, 2014 was filed on July 23, 2014.
- December 18, 2014. USFWS issued a draft biological opinion (BO) to FTA and SANBAG's for review and comment. Due to overlapping Federal and State listings for both LBV and Wooly star, the draft BO was forwarded to the California Department of Fish and Wildlife (CDFW).

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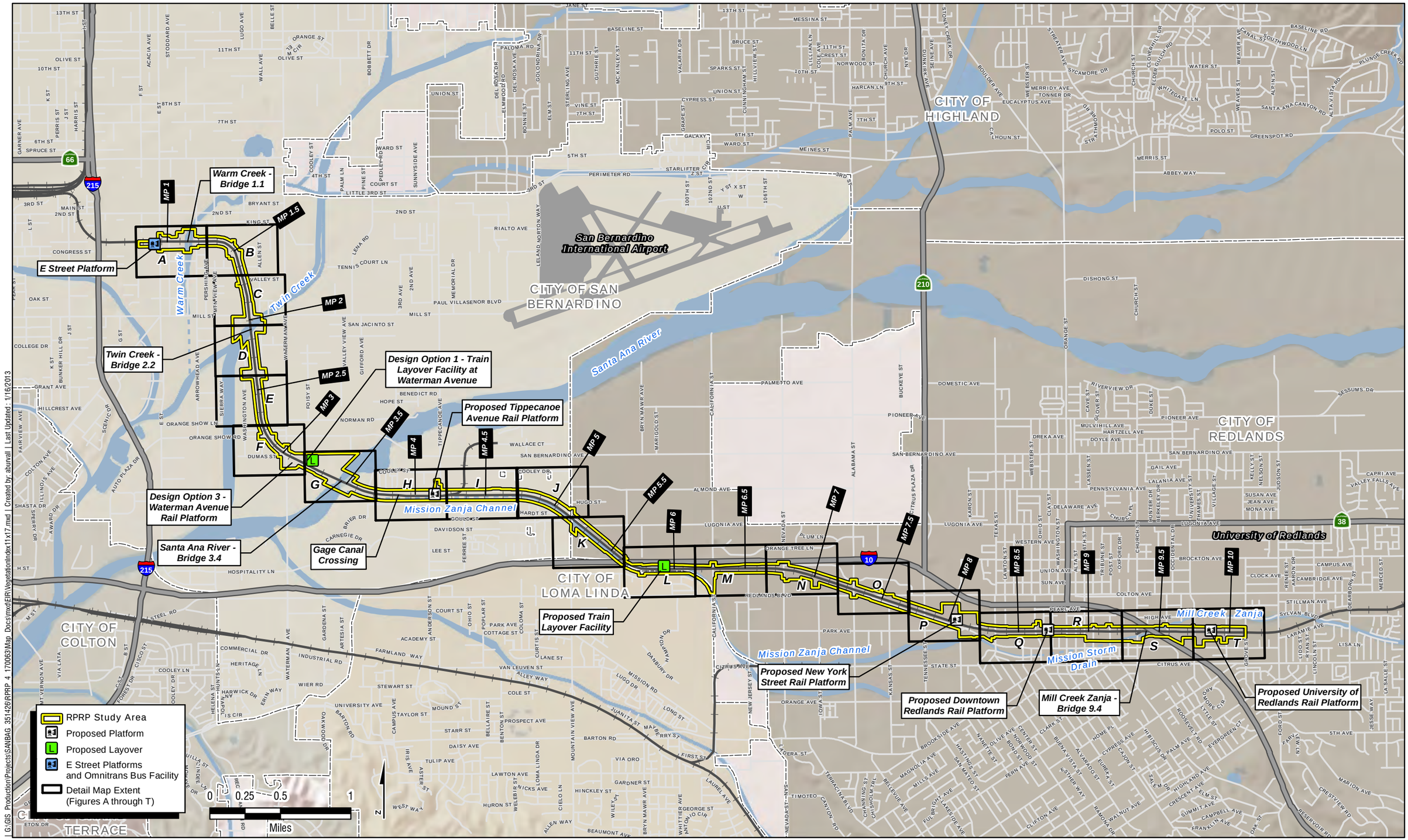
APPENDIX A

Project Figures



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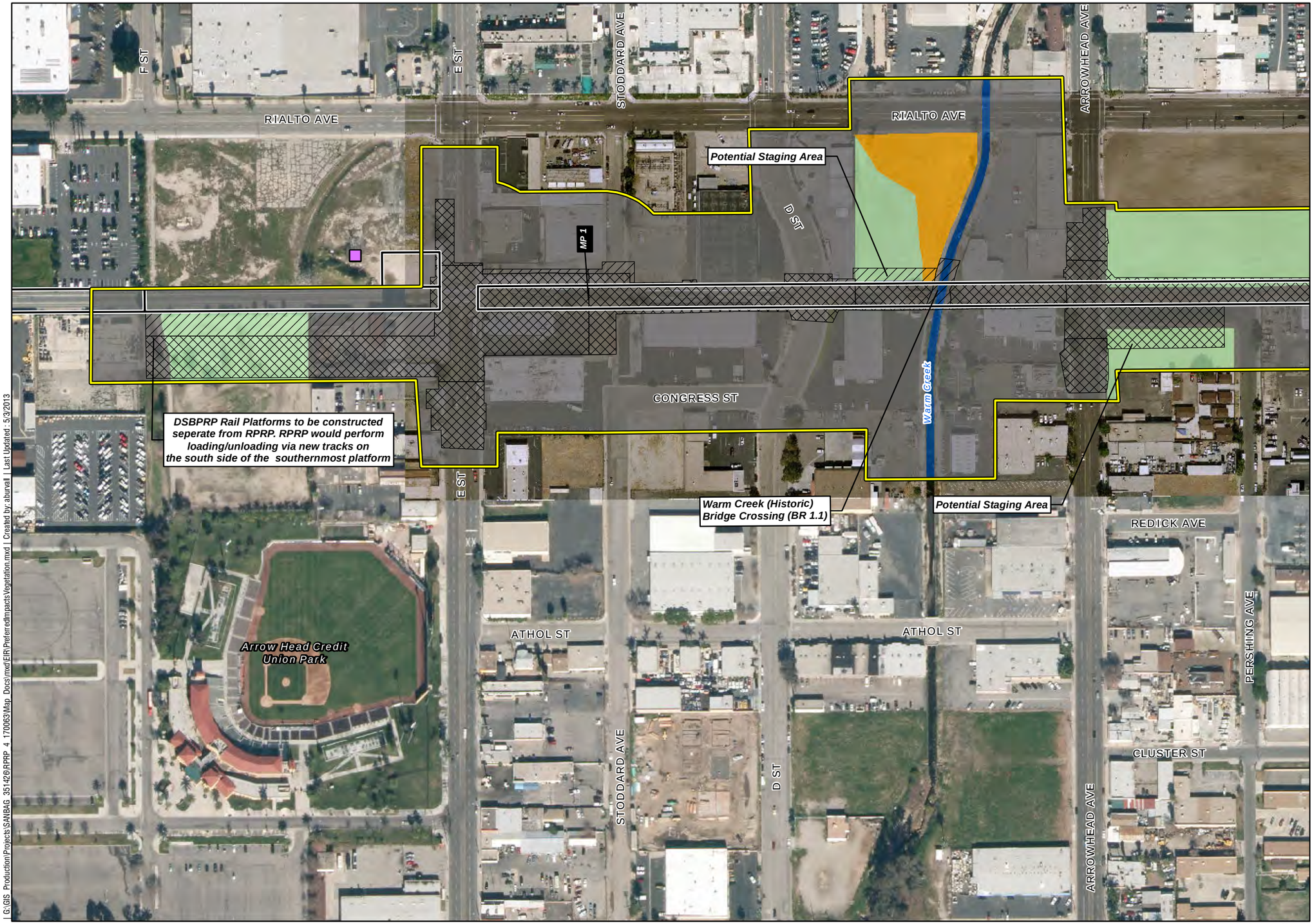
Impacts on Vegetation Communities Overview (Preferred Project)

Figure 4

FTA/SANBAG | Redlands Passenger Rail Project | BTR

HDR
ONE COMPANY | *Many Solutions*℠



RPRP Study Area

Footprint

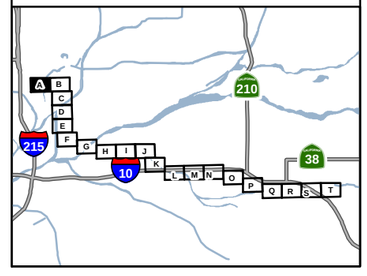
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 A

FTA/SANBAG | Redlands Passenger Rail Project | BTR

HDR ONE COMPANY | *Many Solutions*℠

RIALTO AVE
MTN VIEW AVE
SIERRA WAY
Meadowbrook Park
ALLEN ST
IRWIN ST
MP 1.5
JULIA ST
PERSHING AVE
BOYD ST
CLUSTER ST
MTN VIEW AVE

RPRP Study Area

Footprint
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community
- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation
- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star

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Impacts on Vegetation Communities (Preferred Project)

Figure 4 B

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Footprint

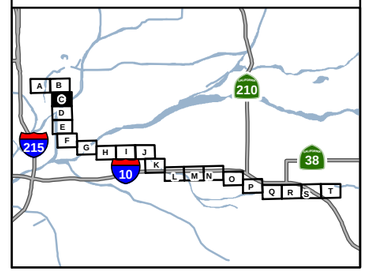
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 C

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Footprint

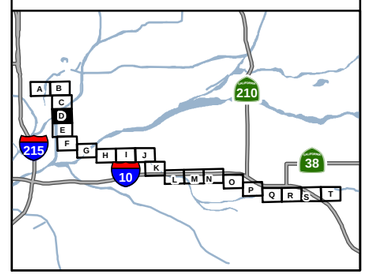
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 D

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Footprint

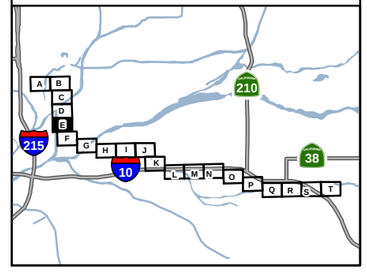
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 E

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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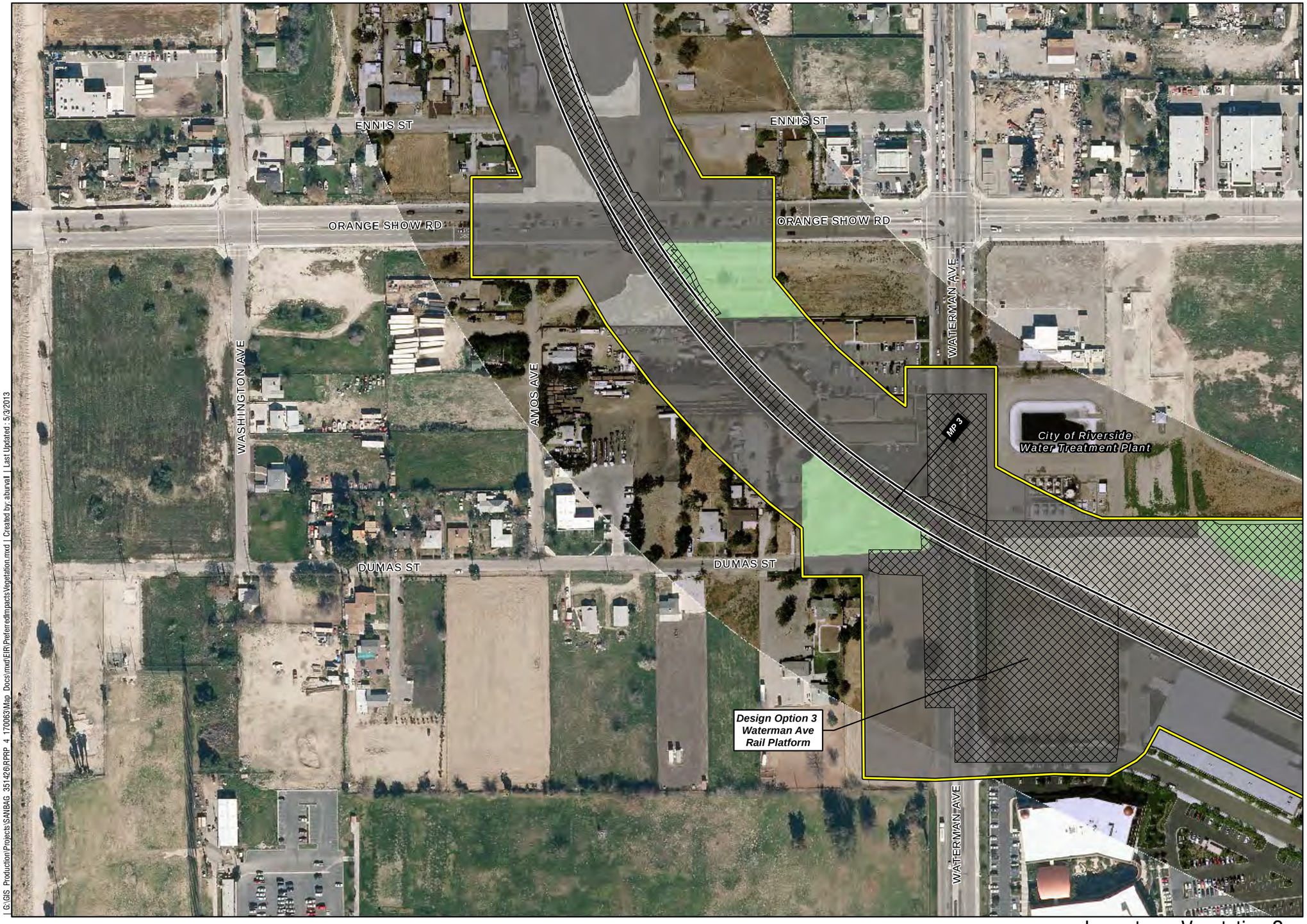


RPRP Study Area

Footprint

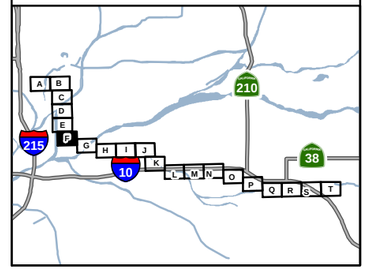
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 F

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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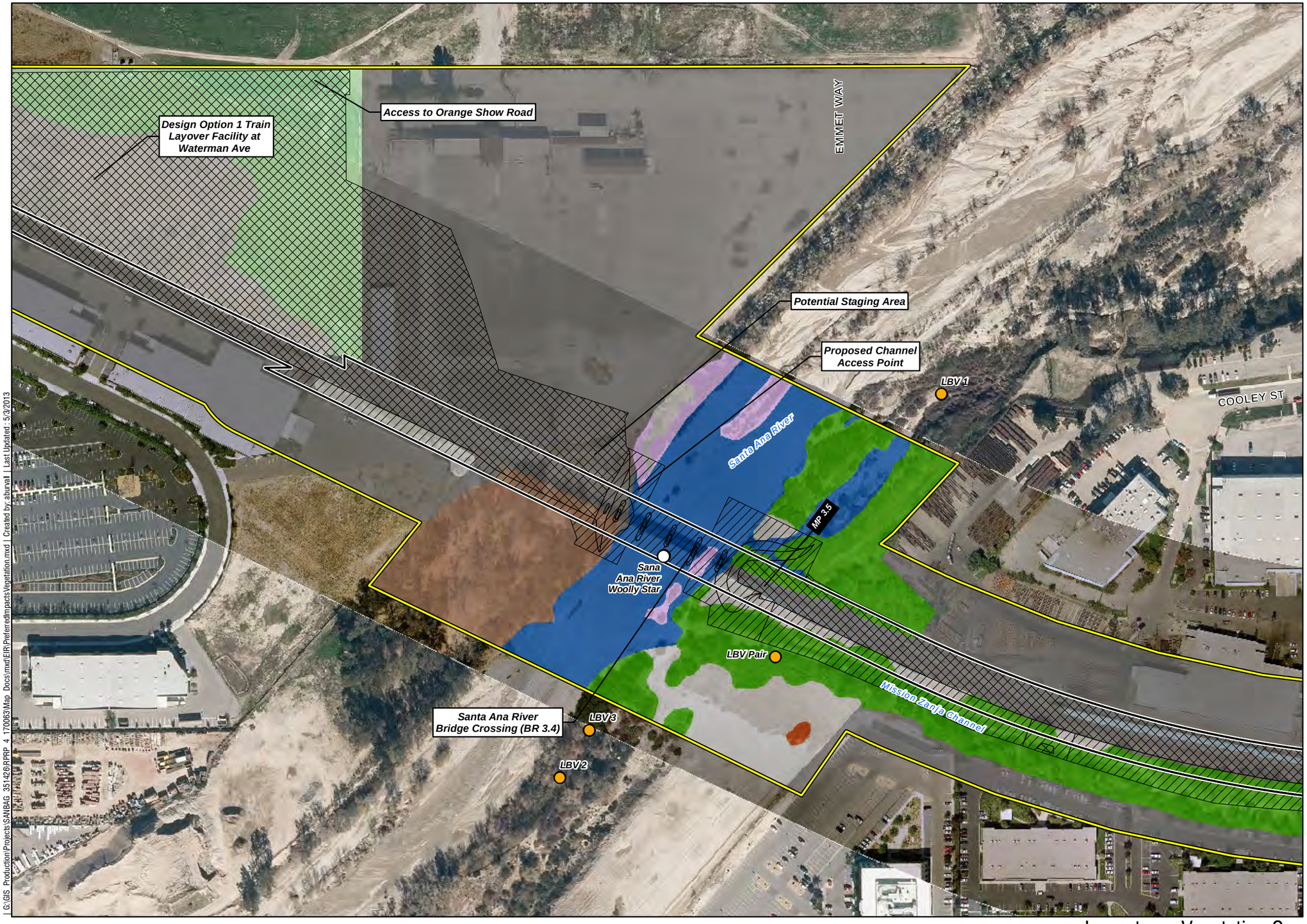


RPRP Study Area

Footprint

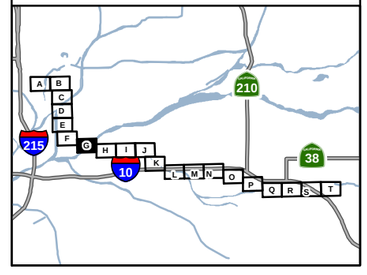
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 G

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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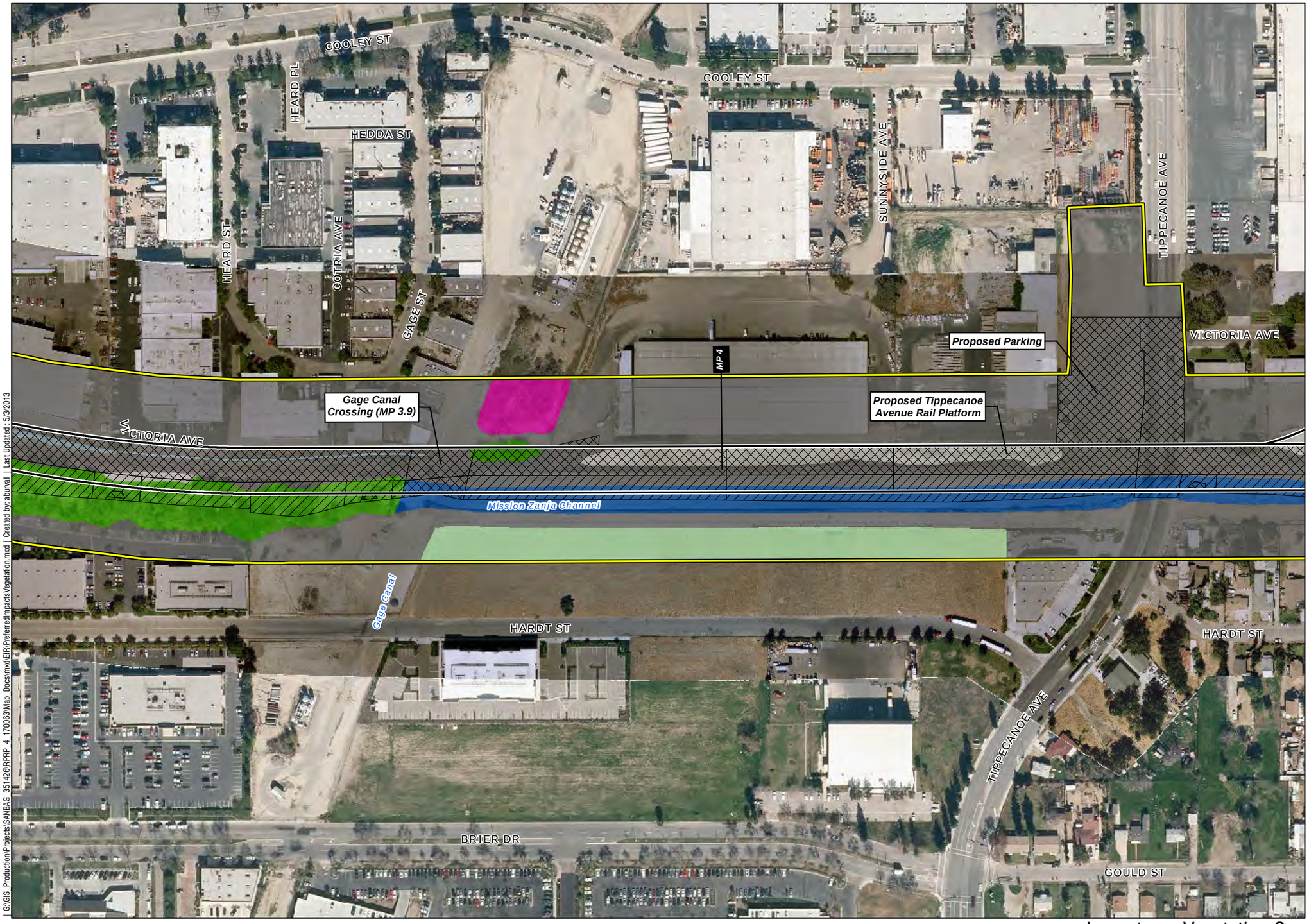


RPRP Study Area

Footprint

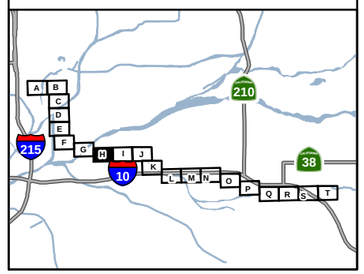
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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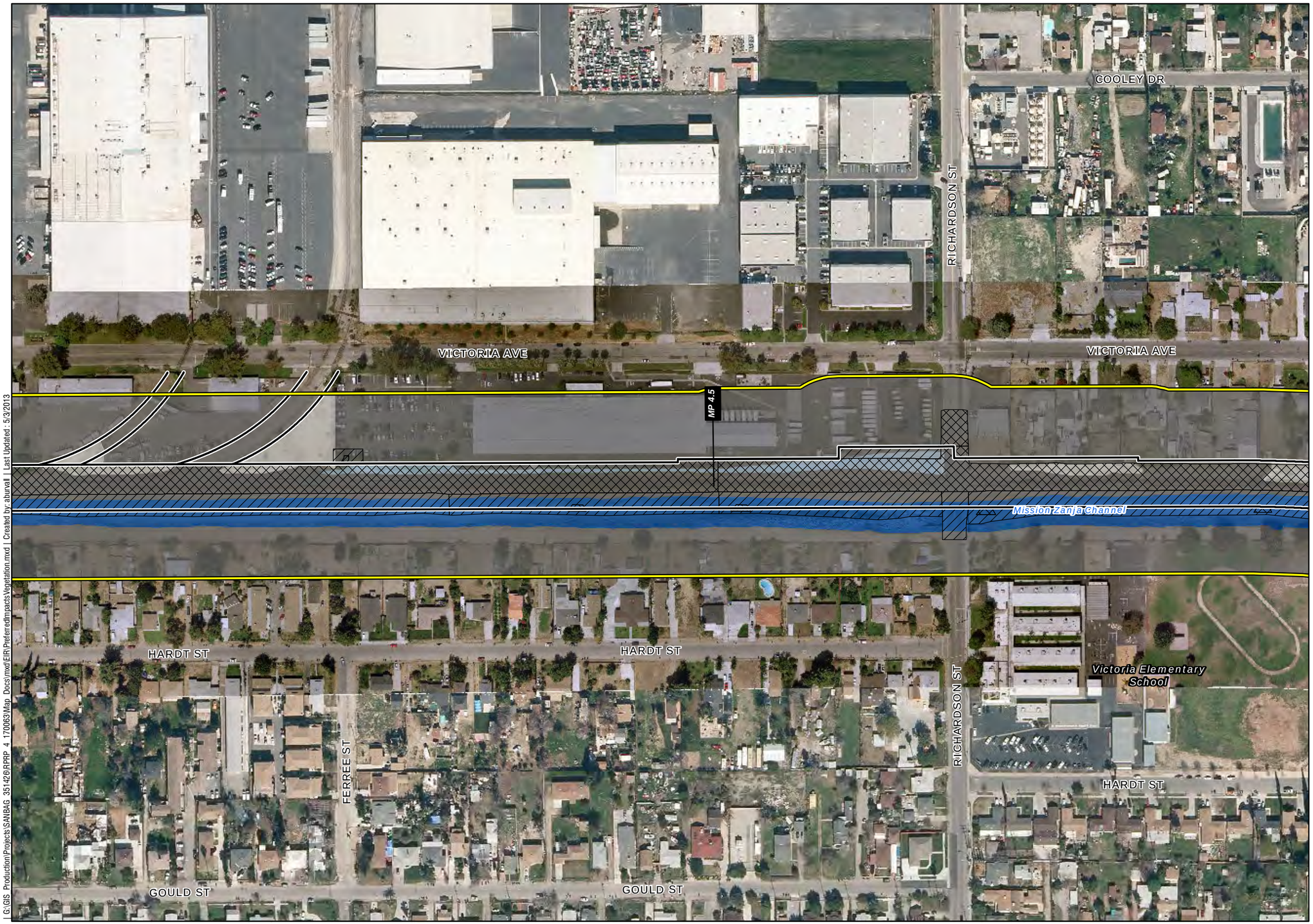
Impacts on Vegetation Communities (Preferred Project)

Figure 4 H

FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Footprint

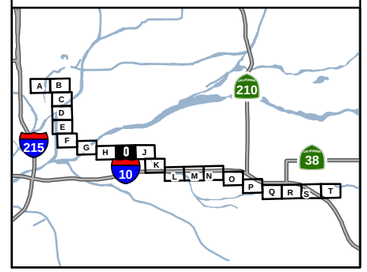
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 I

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Footprint

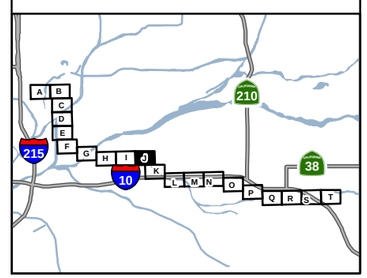
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 J

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Footprint

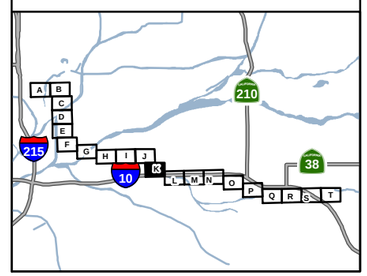
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 K

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Footprint

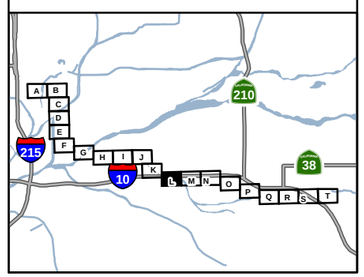
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 L

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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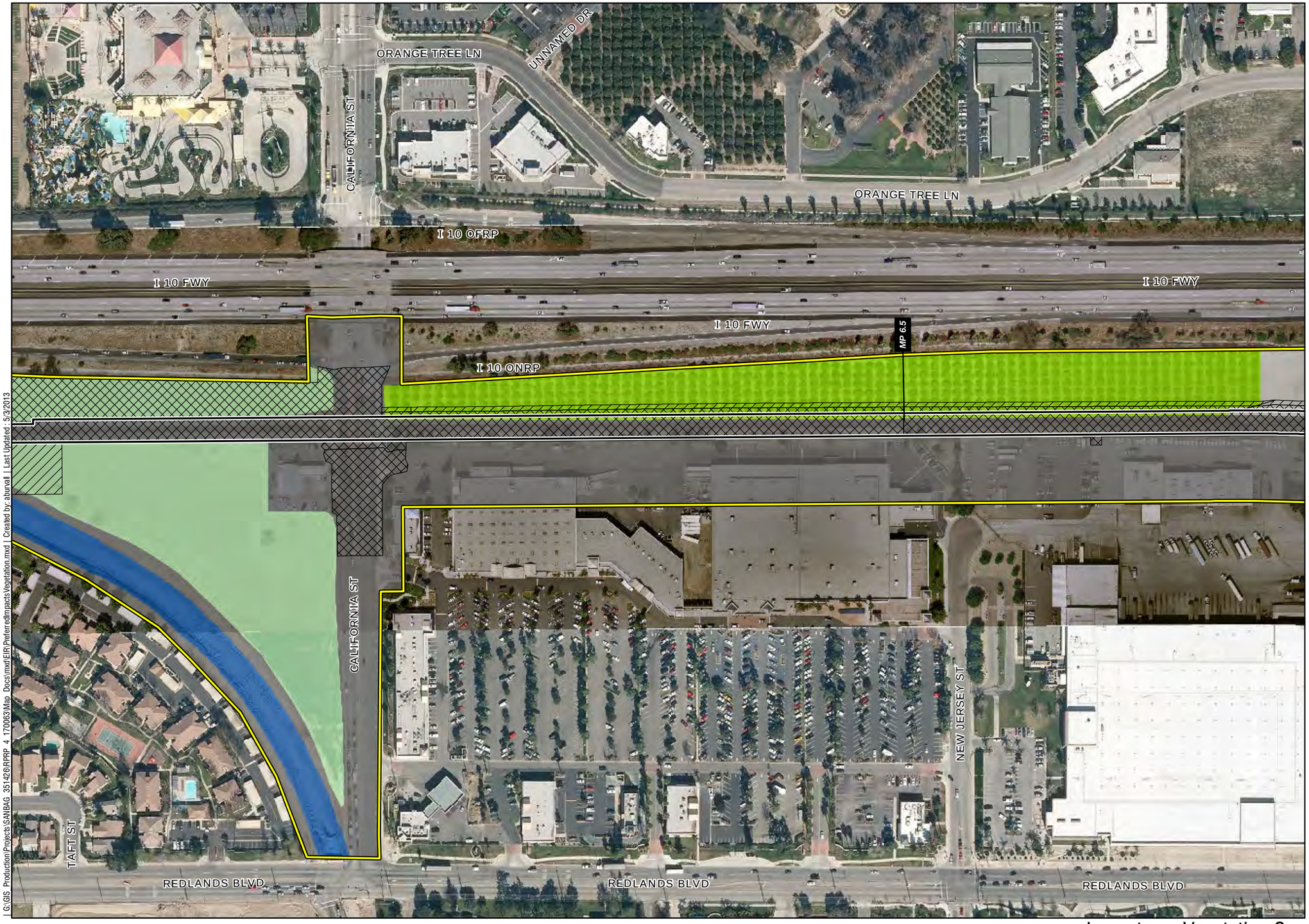


RPRP Study Area

Footprint

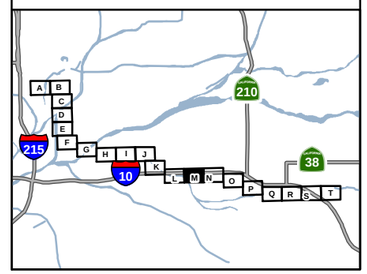
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 M

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Footprint

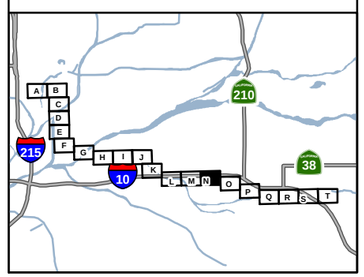
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 N

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Footprint

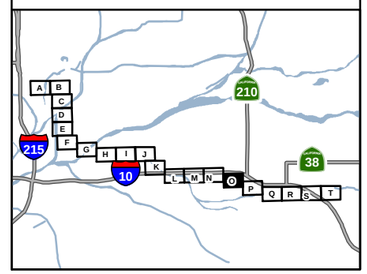
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 0

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Footprint

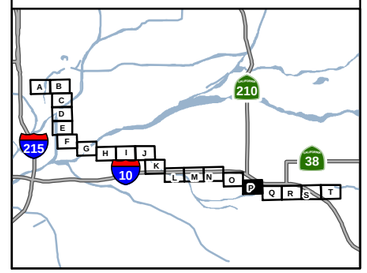
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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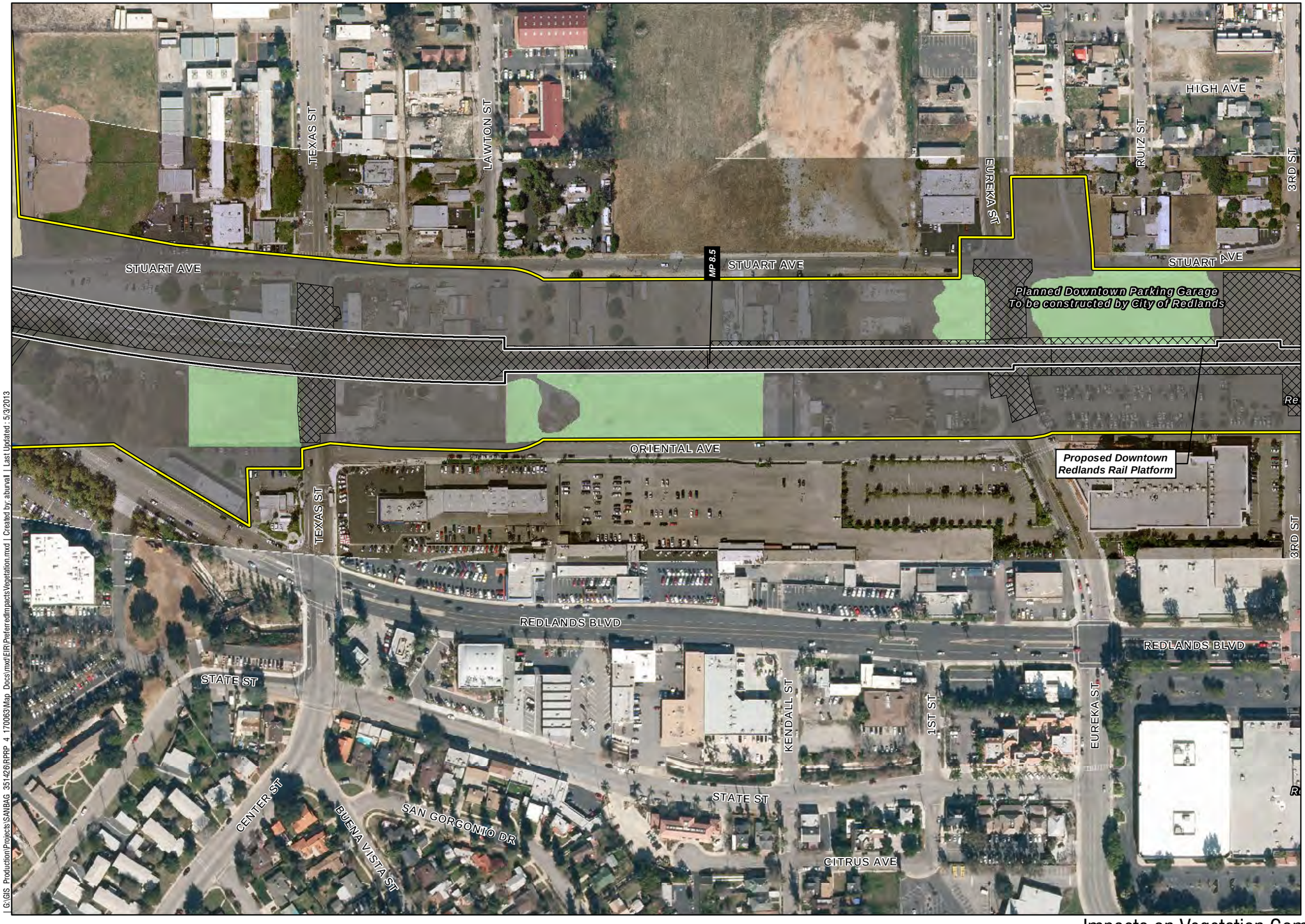
Impacts on Vegetation Communities (Preferred Project)

Figure 4 P

FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Footprint

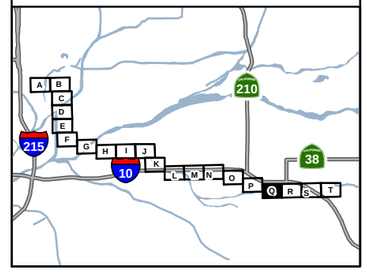
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 Q

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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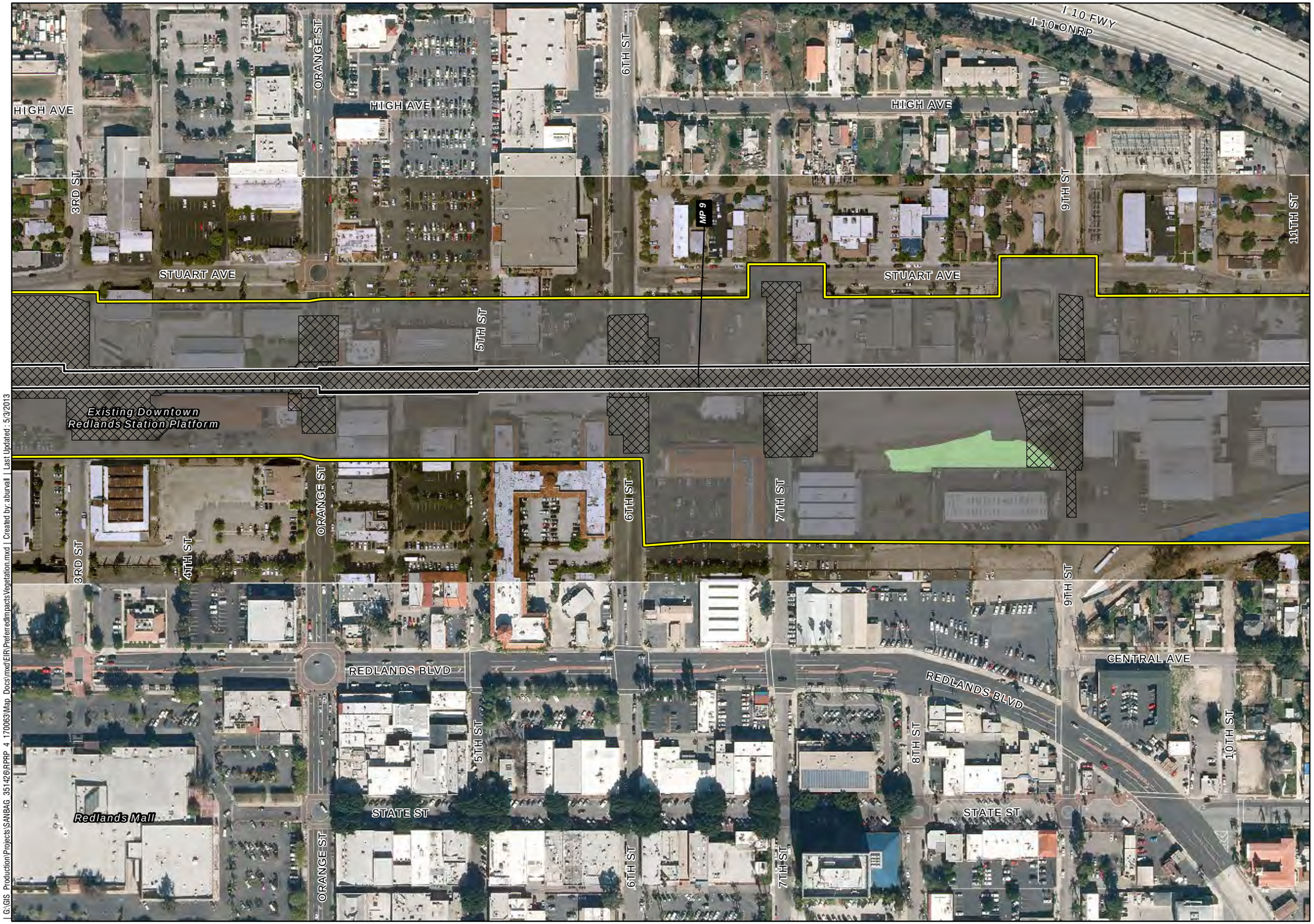

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Impacts on Vegetation Communities (Preferred Project)

Figure 4 R

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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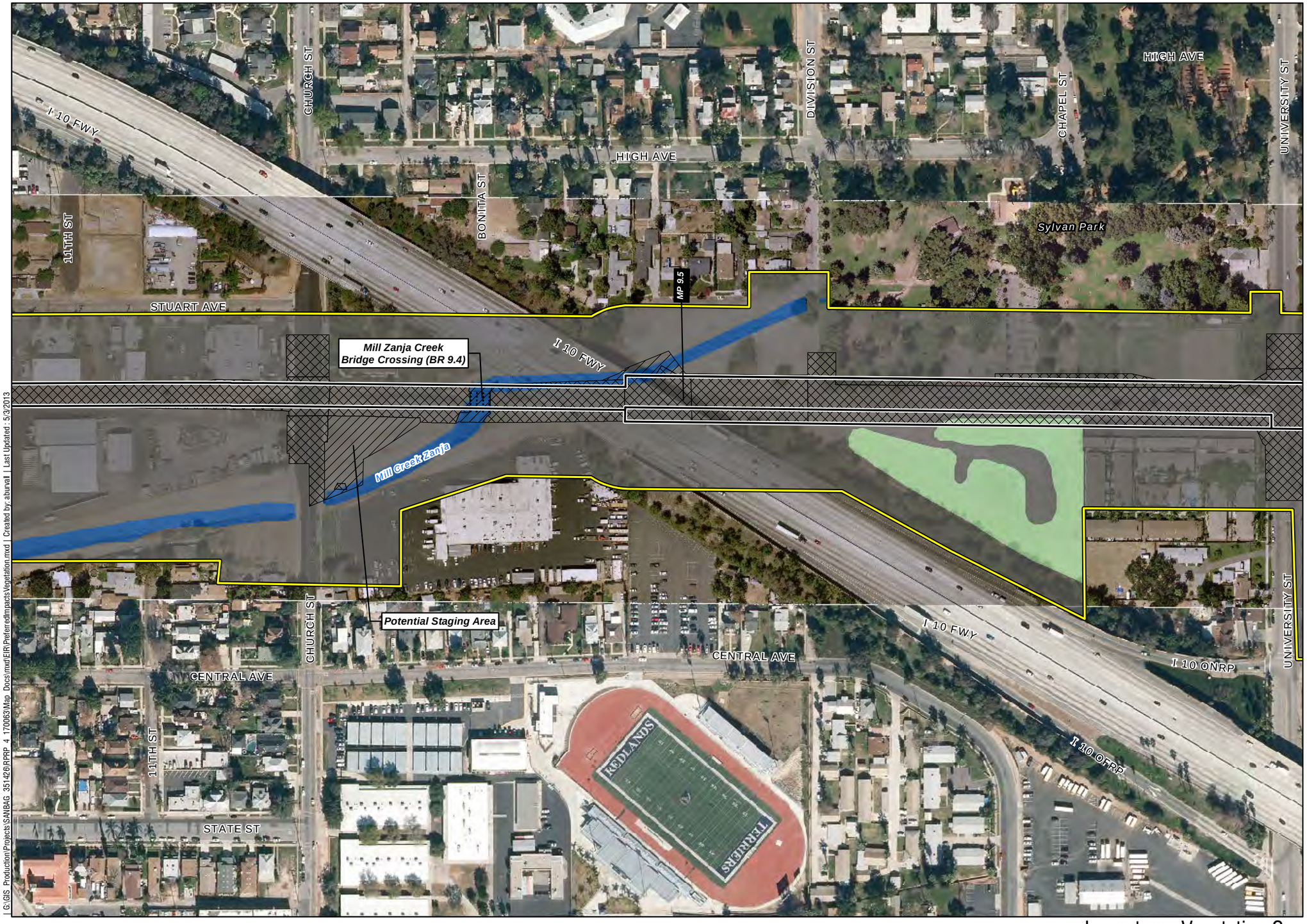


RPRP Study Area

Footprint

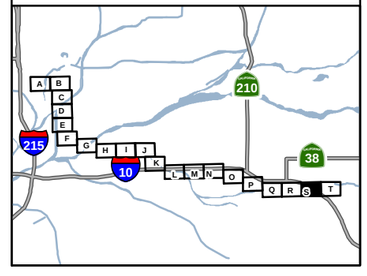
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 S

FTA/SANBAG | Redlands Passenger Rail Project | BTR

HDR
ONE COMPANY | *Many Solutions*℠

RPRP Study Area

Footprint

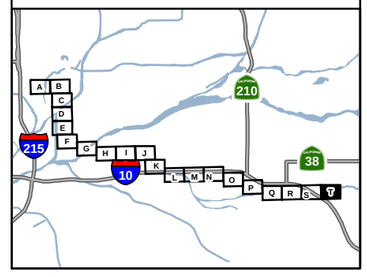
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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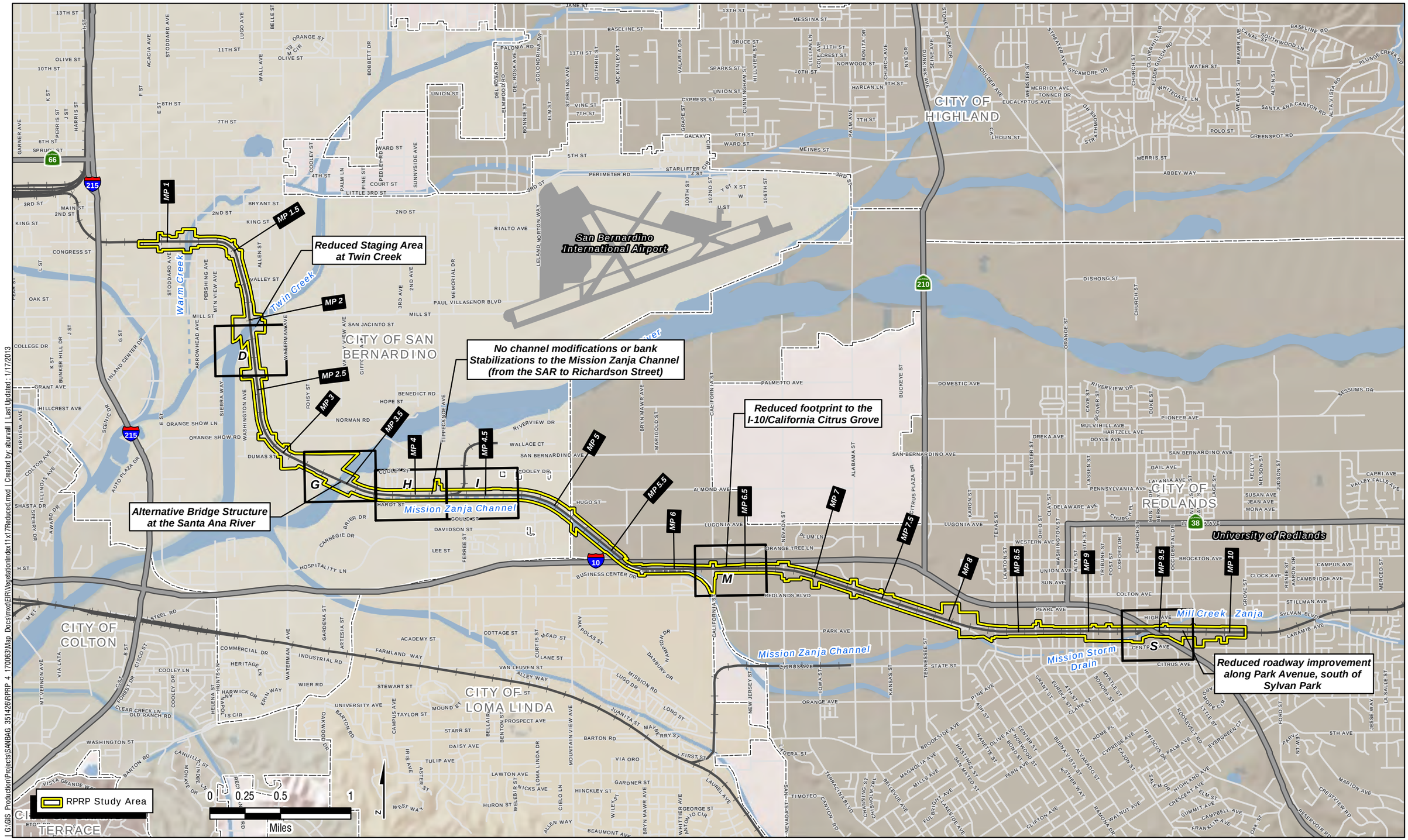
Impacts on Vegetation Communities (Preferred Project)

Figure 4 T

FTA/SANBAG | Redlands Passenger Rail Project | BTR

HDR ONE COMPANY | *Many Solutions*℠



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Impacts on Vegetation Communities Overview (Reduced Project)

Figure 5

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Reduced

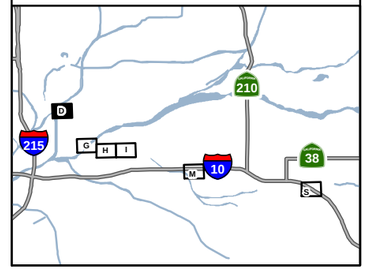
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Reduced Project)

Figure 5 D

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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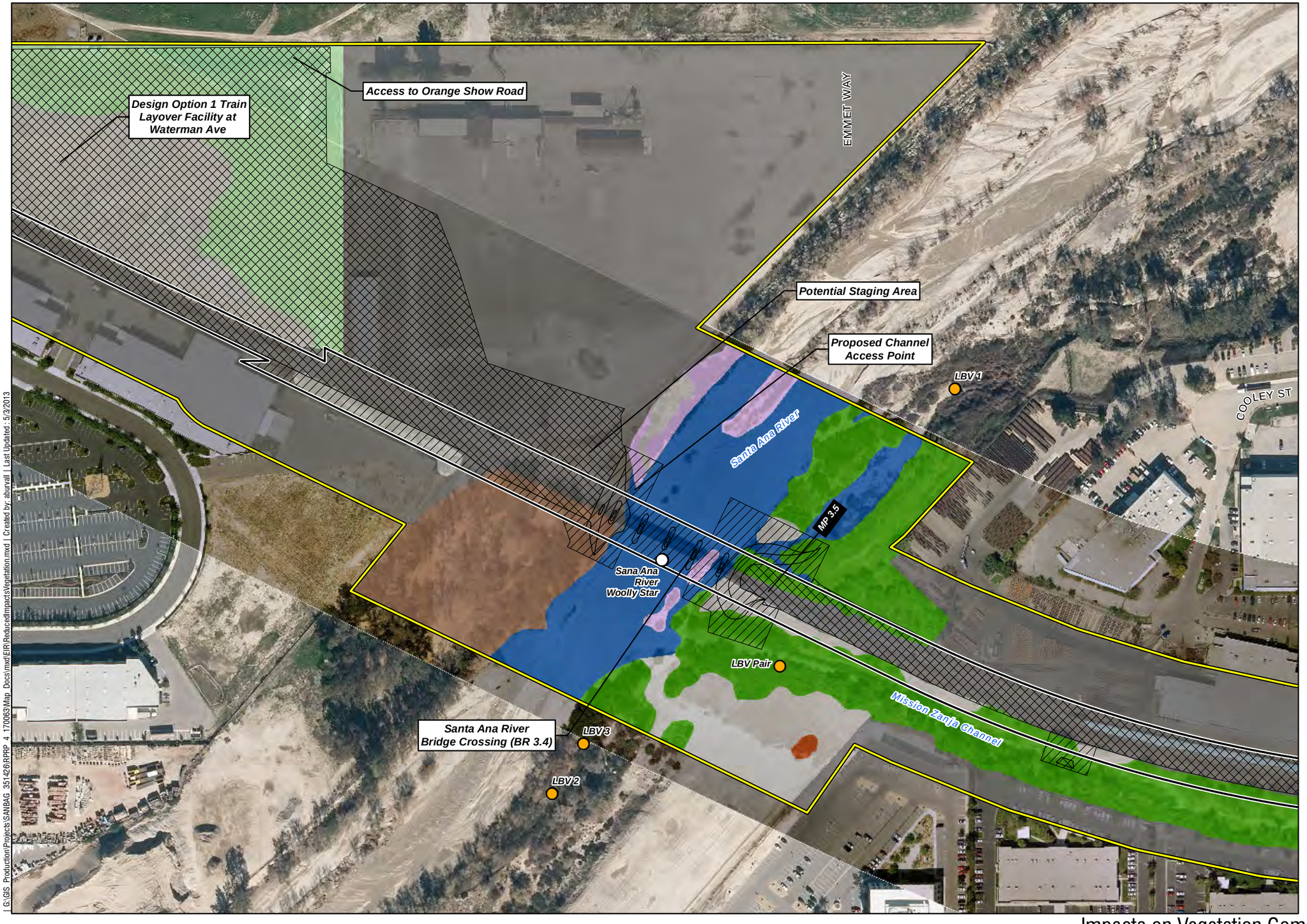


RPRP Study Area

Reduced

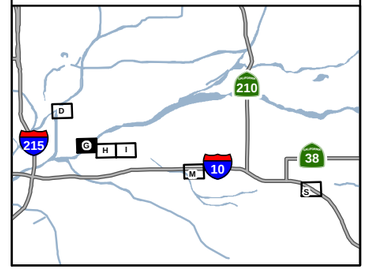
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Reduced Project)

Figure 5 G

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Reduced

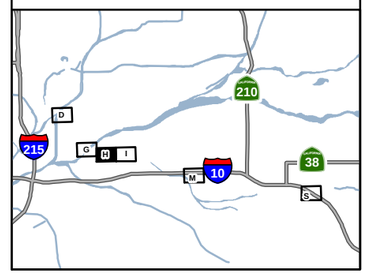
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Reduced Project)

Figure 5 H

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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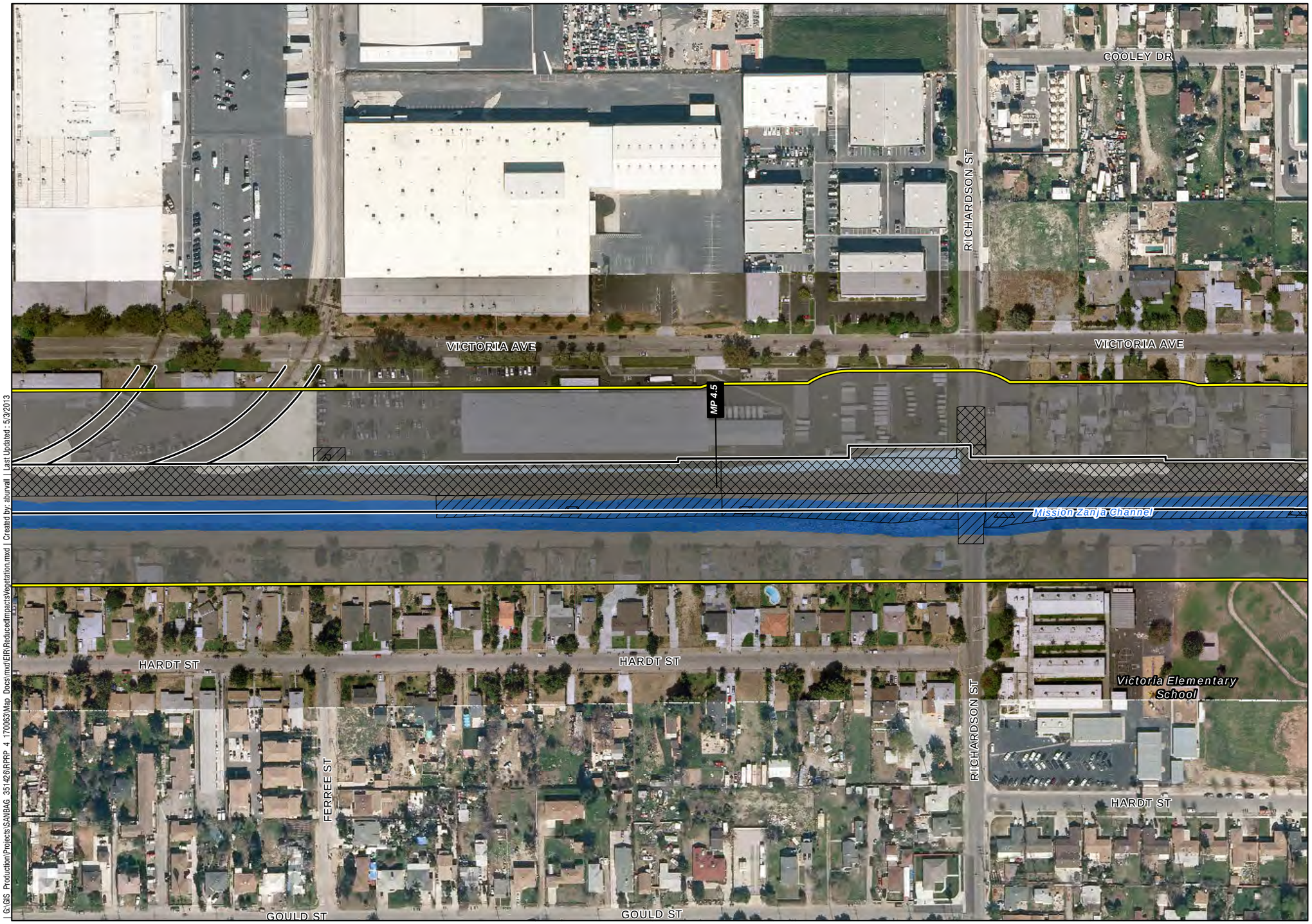


RPRP Study Area

Reduced

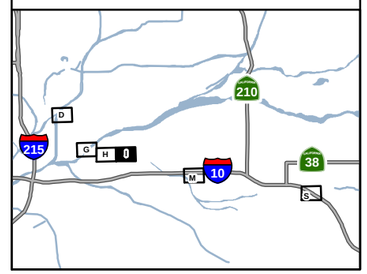
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

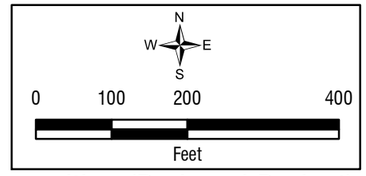
Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Least Bell's Vireo
- Sana Ana River Woolly Star





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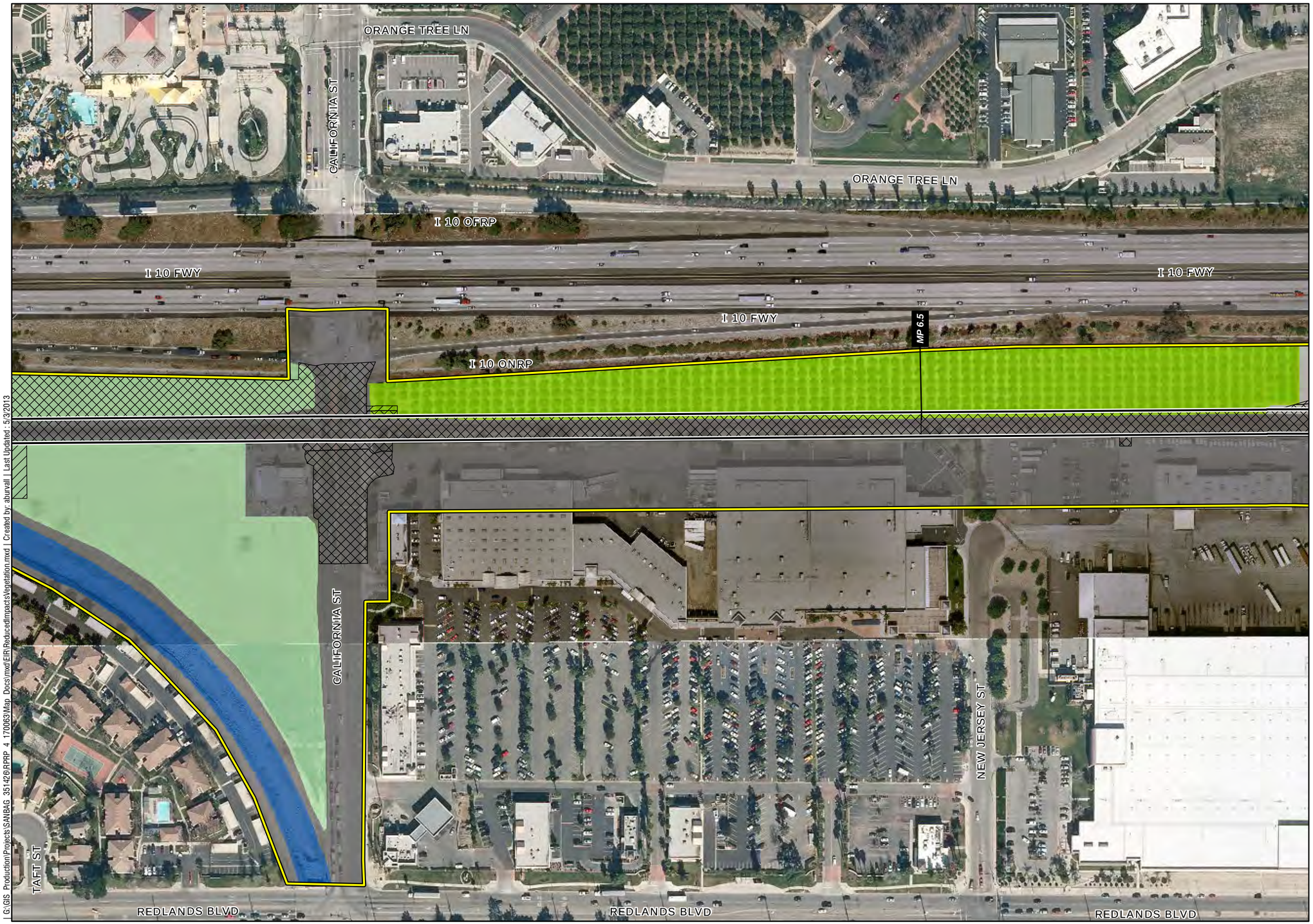
Impacts on Vegetation Communities (Reduced Project)

Figure 5 I

FTA/SANBAG | Redlands Passenger Rail Project | BTR

HDR ONE COMPANY | *Many Solutions*℠



RPRP Study Area

Reduced

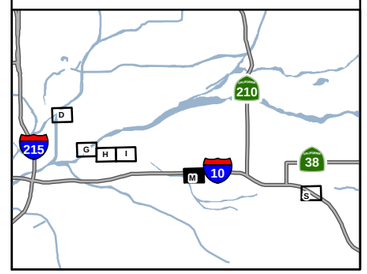
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Reduced Project)

Figure 5 M

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Reduced

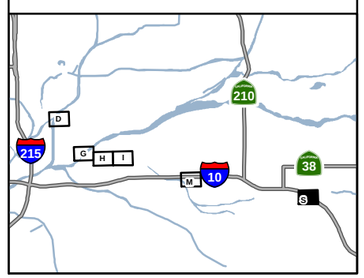
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Reduced Project)

Figure 5 S

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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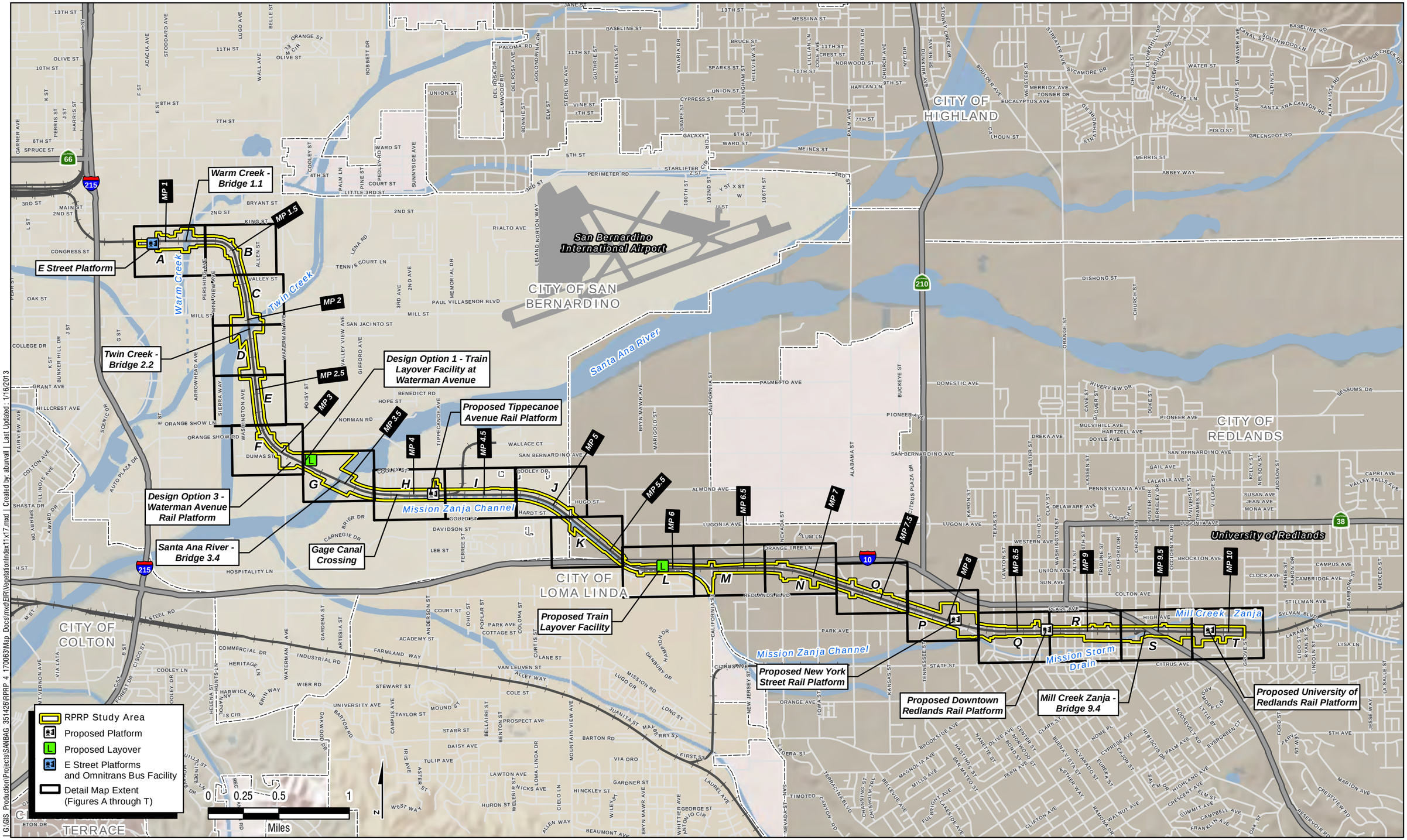

Impacts on Wetland and Waters of the U.S Overview (Preferred Project)

Figure 6

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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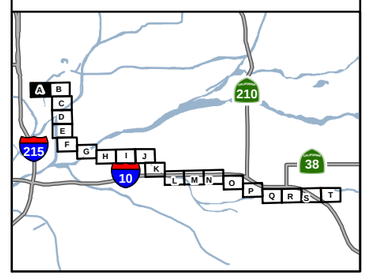
RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 A

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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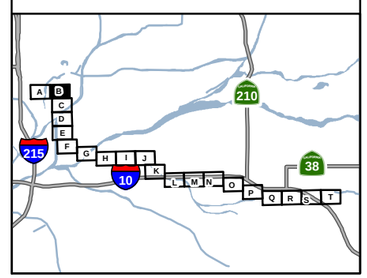
RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 B
FTA/SANBAG | Redlands Passenger Rail Project | BTR

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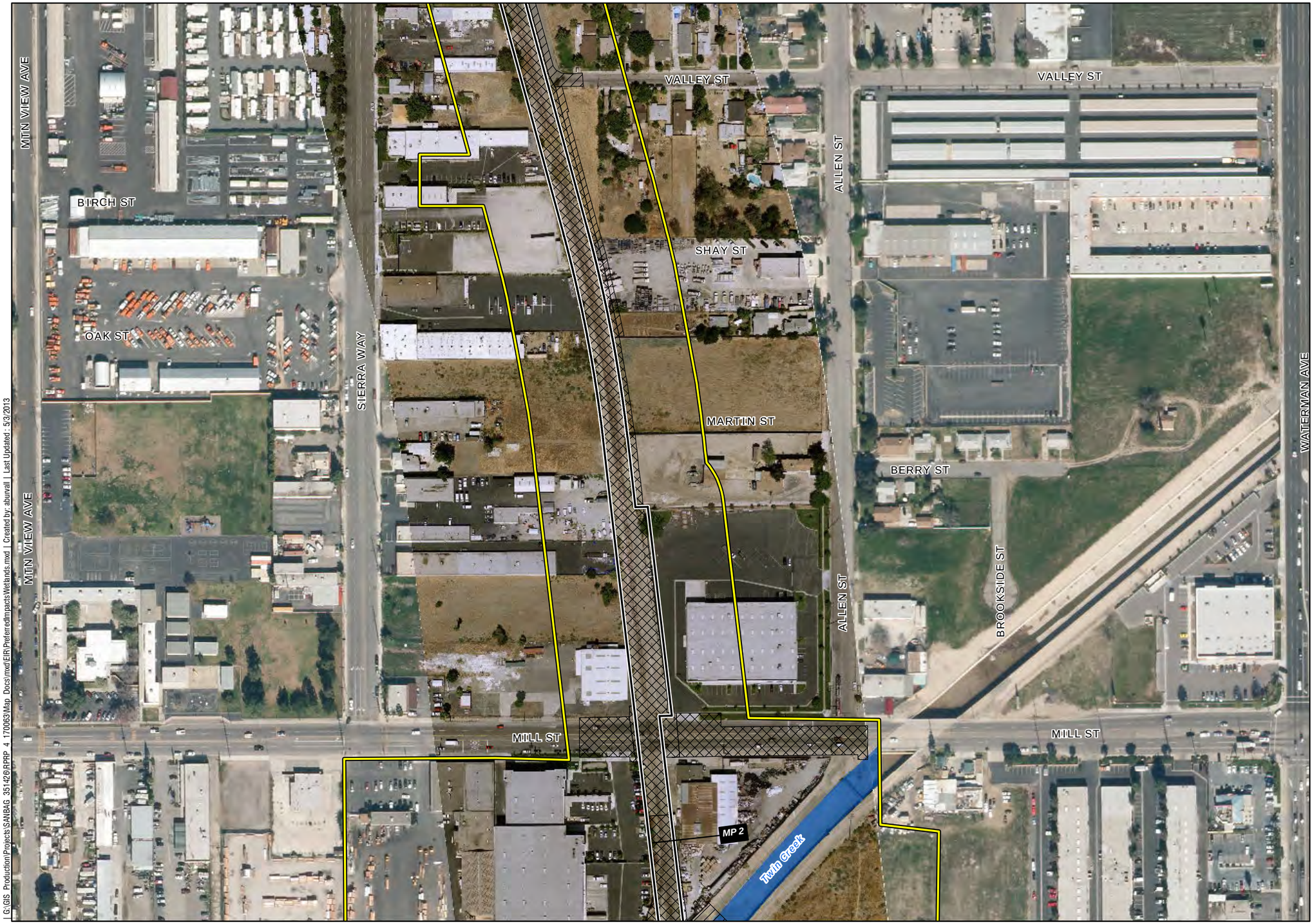


RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

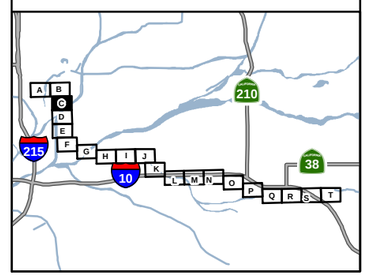
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 C

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

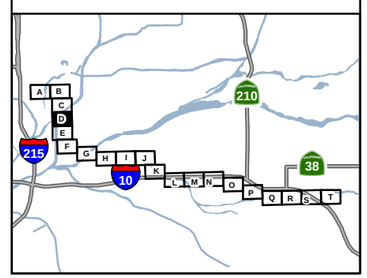
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 D

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

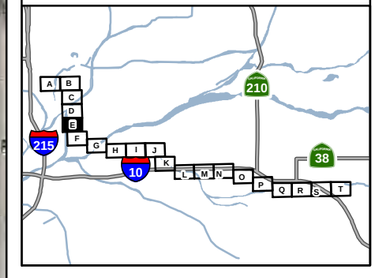
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 E

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

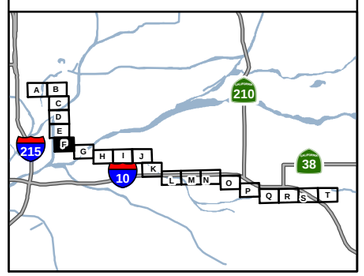
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 F

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

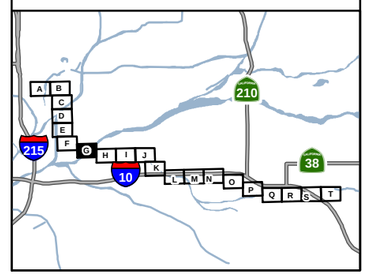
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 G

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

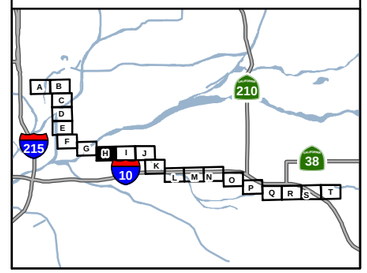
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 H

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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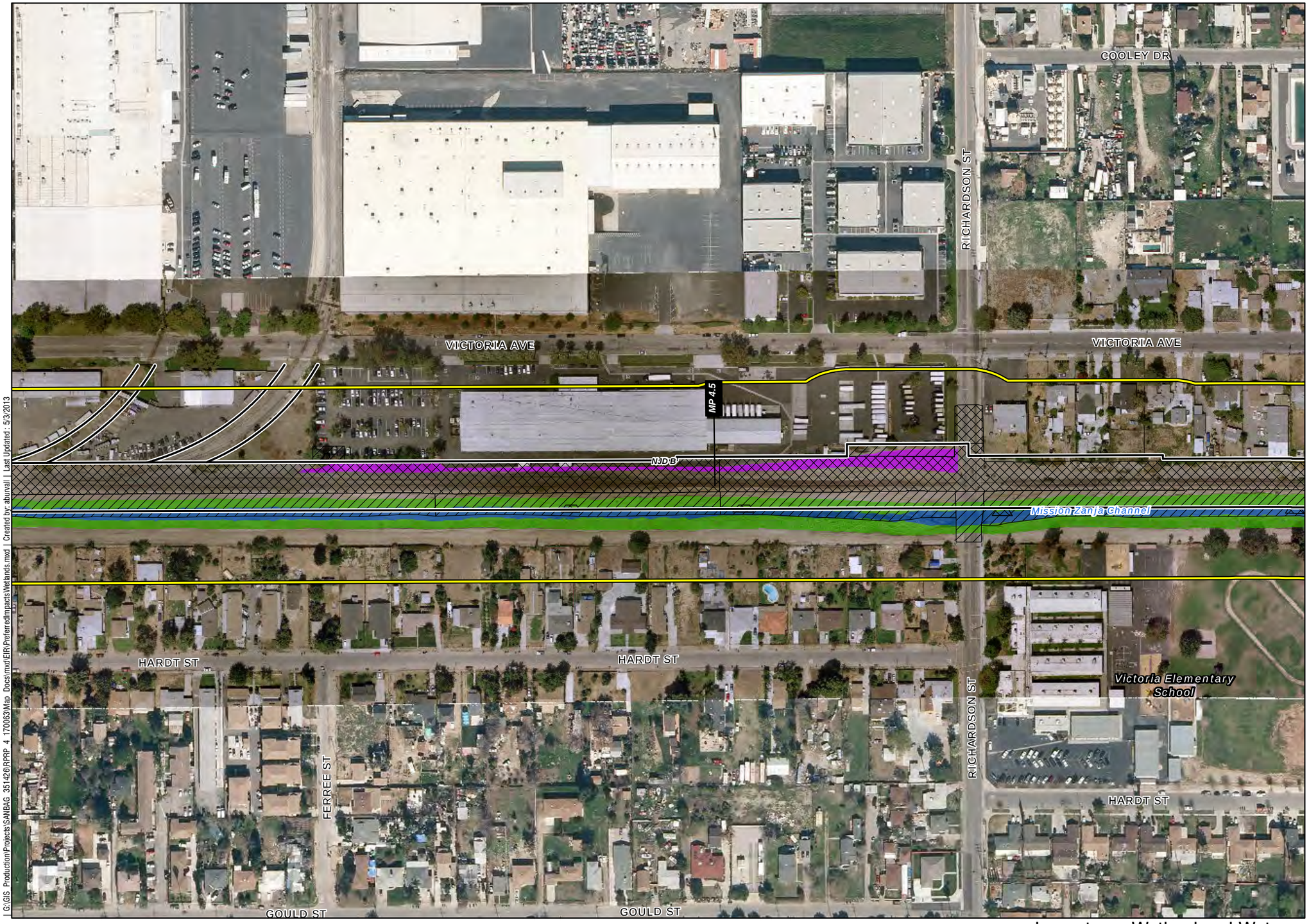


RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

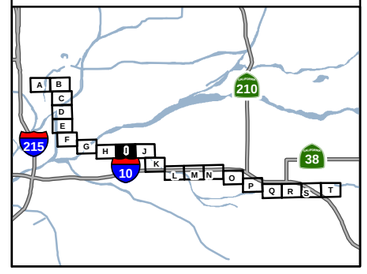
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 I

FTA/SANBAG | Redlands Passenger Rail Project | BTR

HDR

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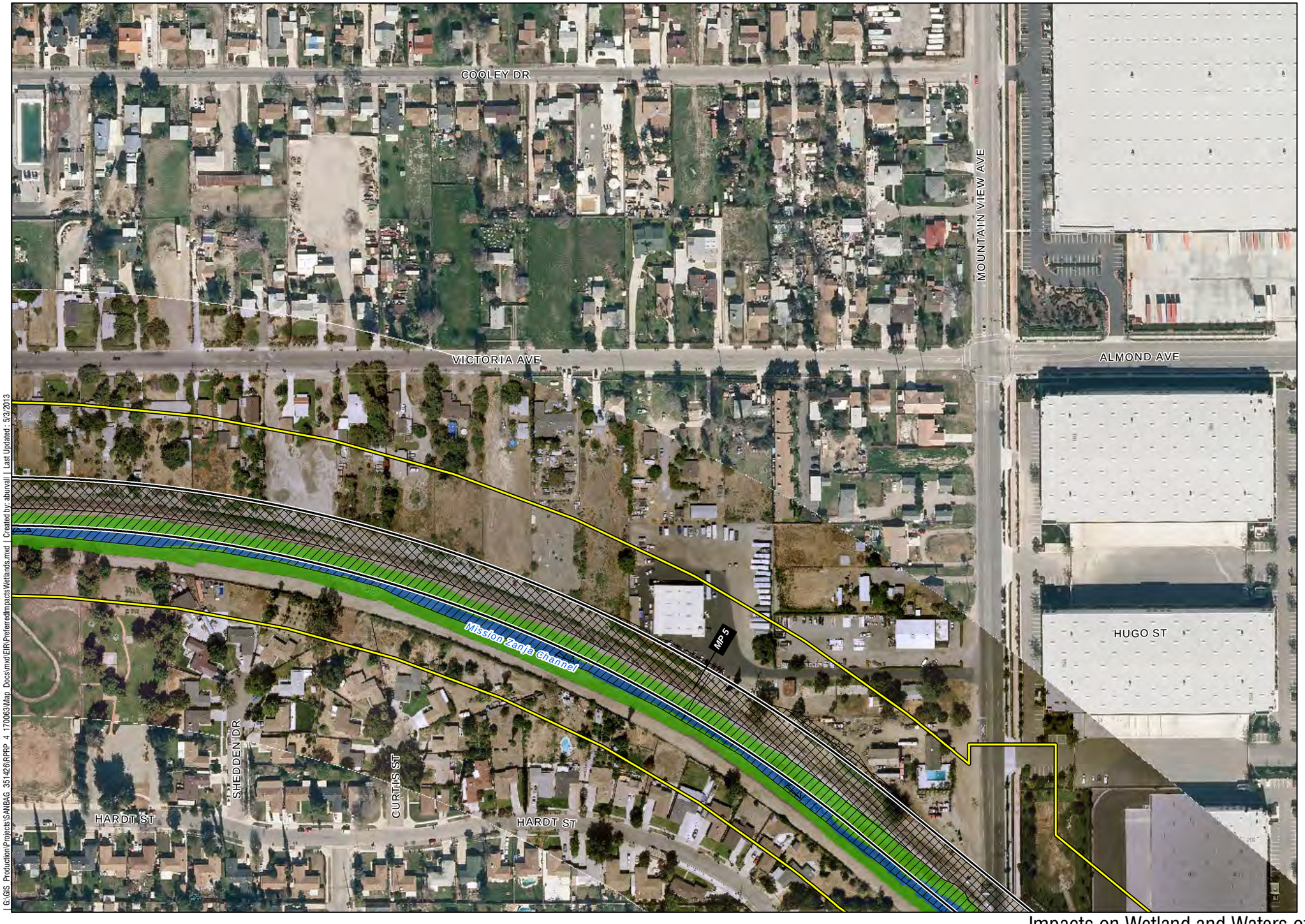


RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

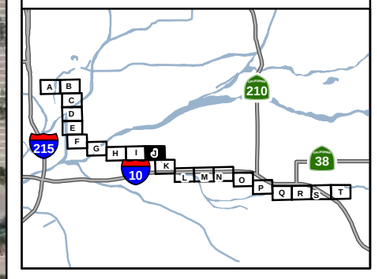
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 J

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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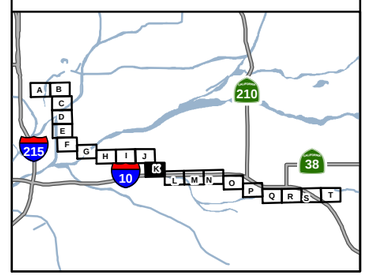
RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Feet

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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 K

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

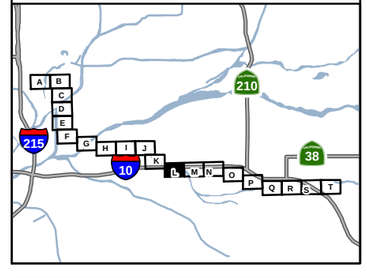
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 L

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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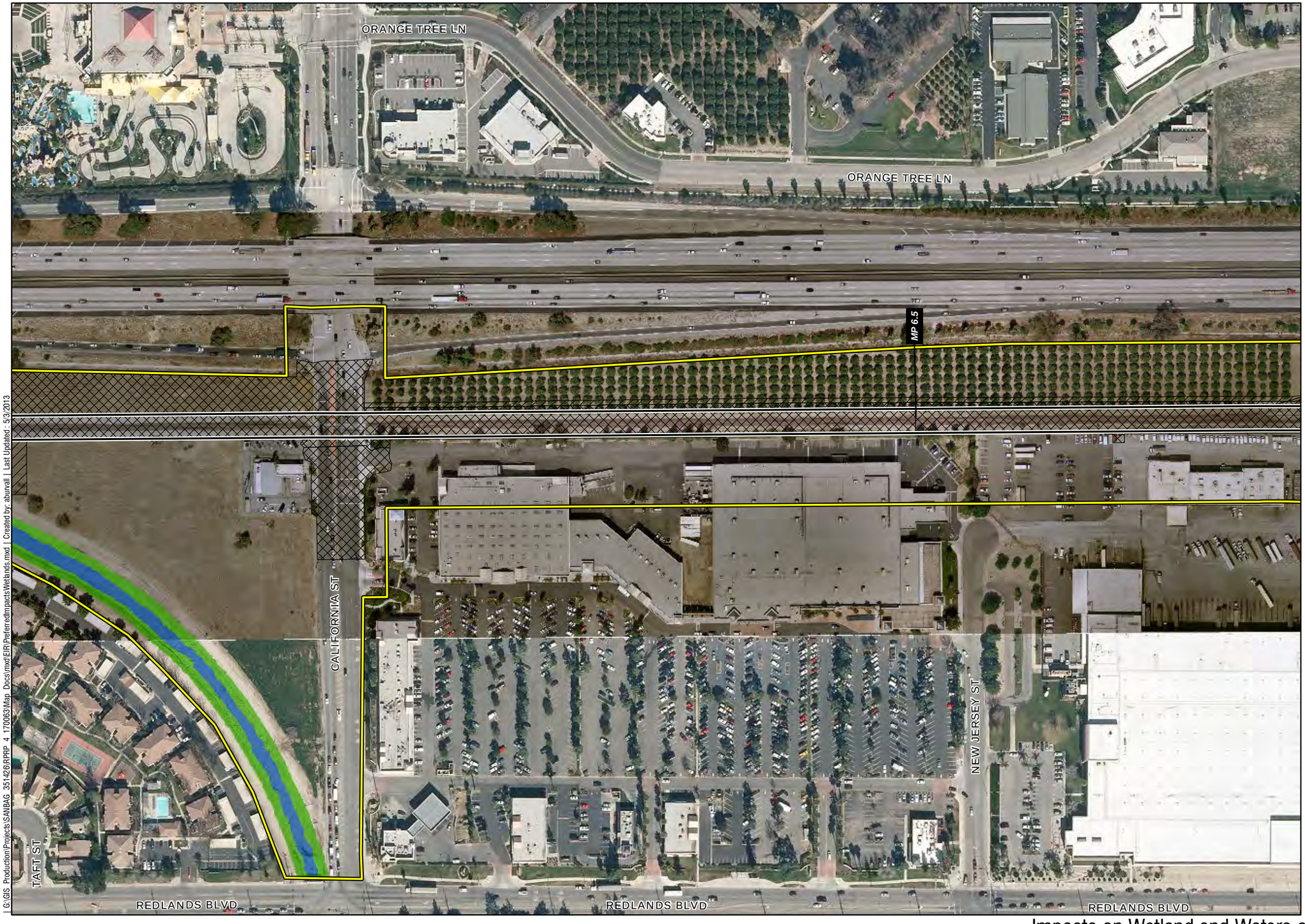
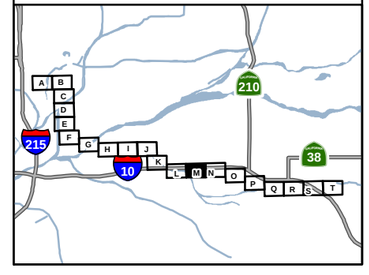


RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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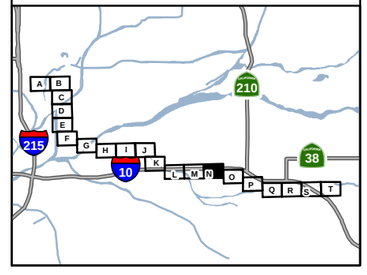
Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 M
FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Feet

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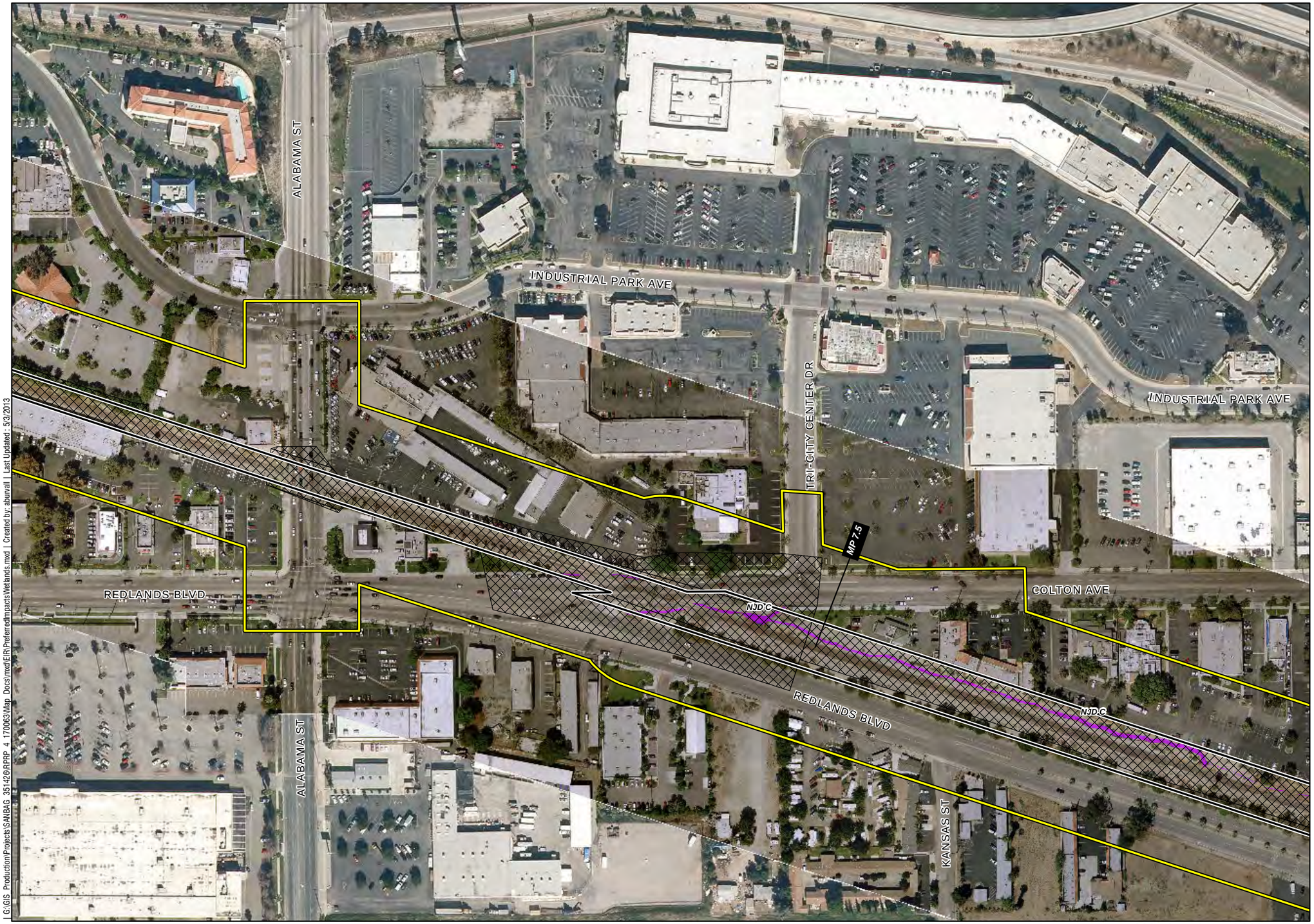
Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 N
FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

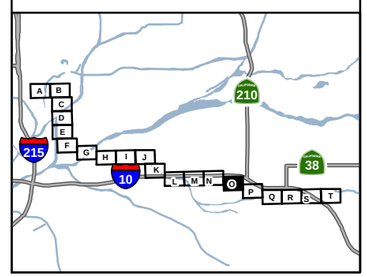
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Feet

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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6.0

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

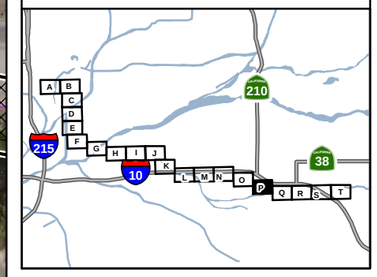
CDFW

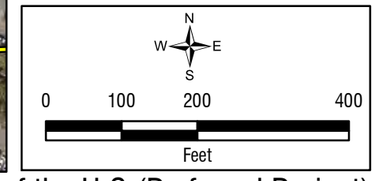
USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit





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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 P

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

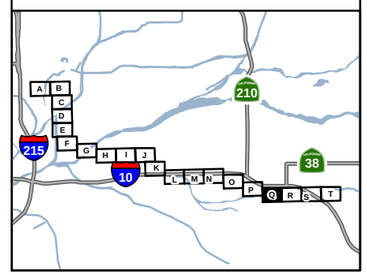
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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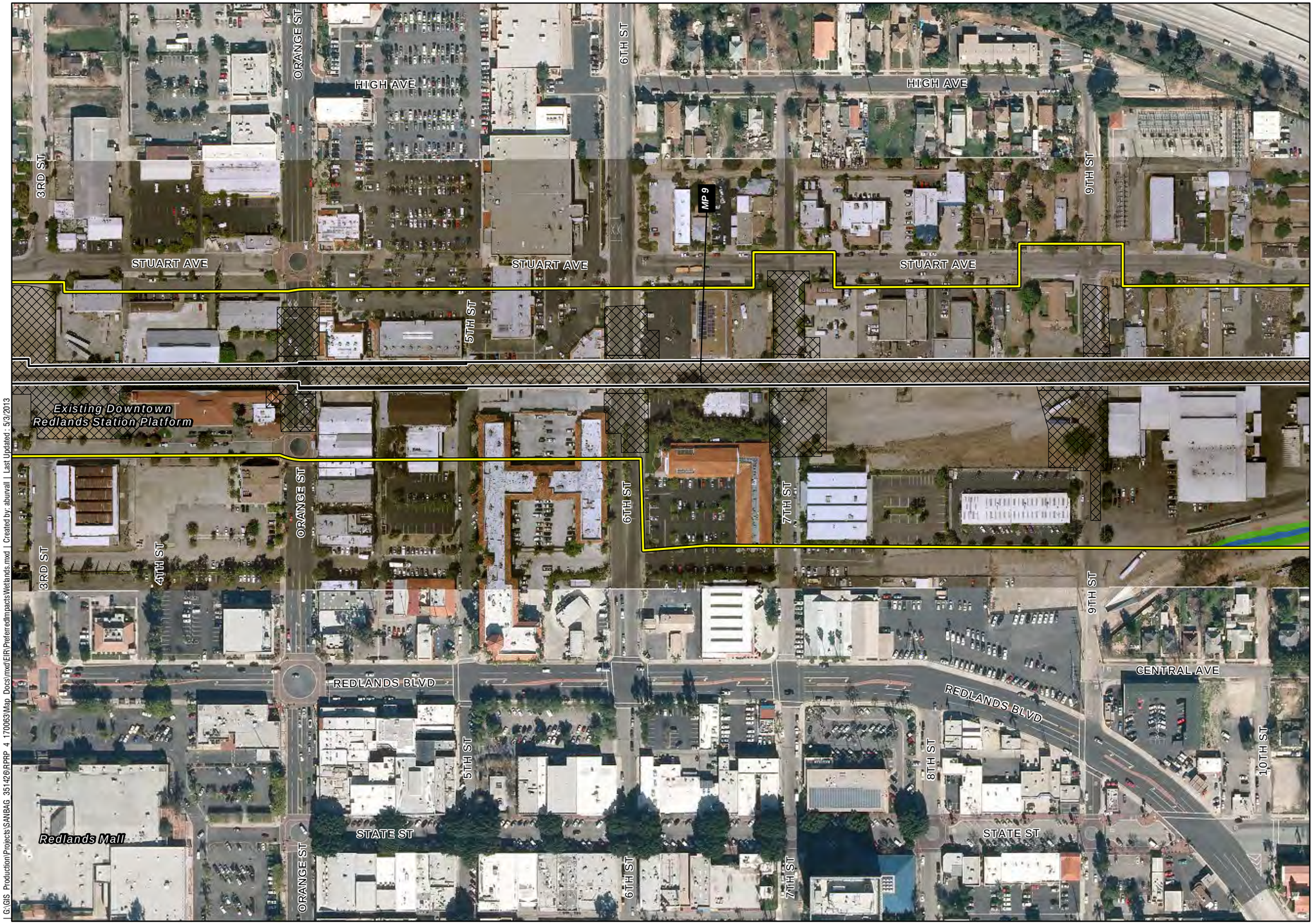
Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 Q

FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

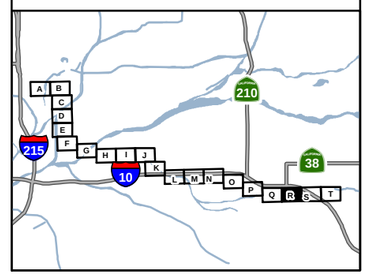
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

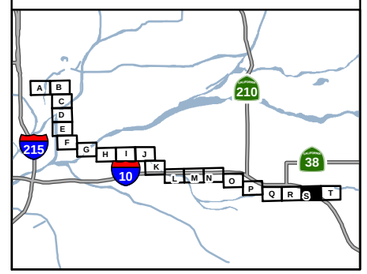
Figure 6 R

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Feet

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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 S

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

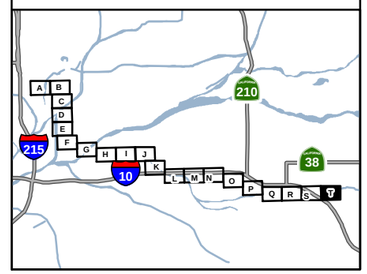
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Feet

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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 T

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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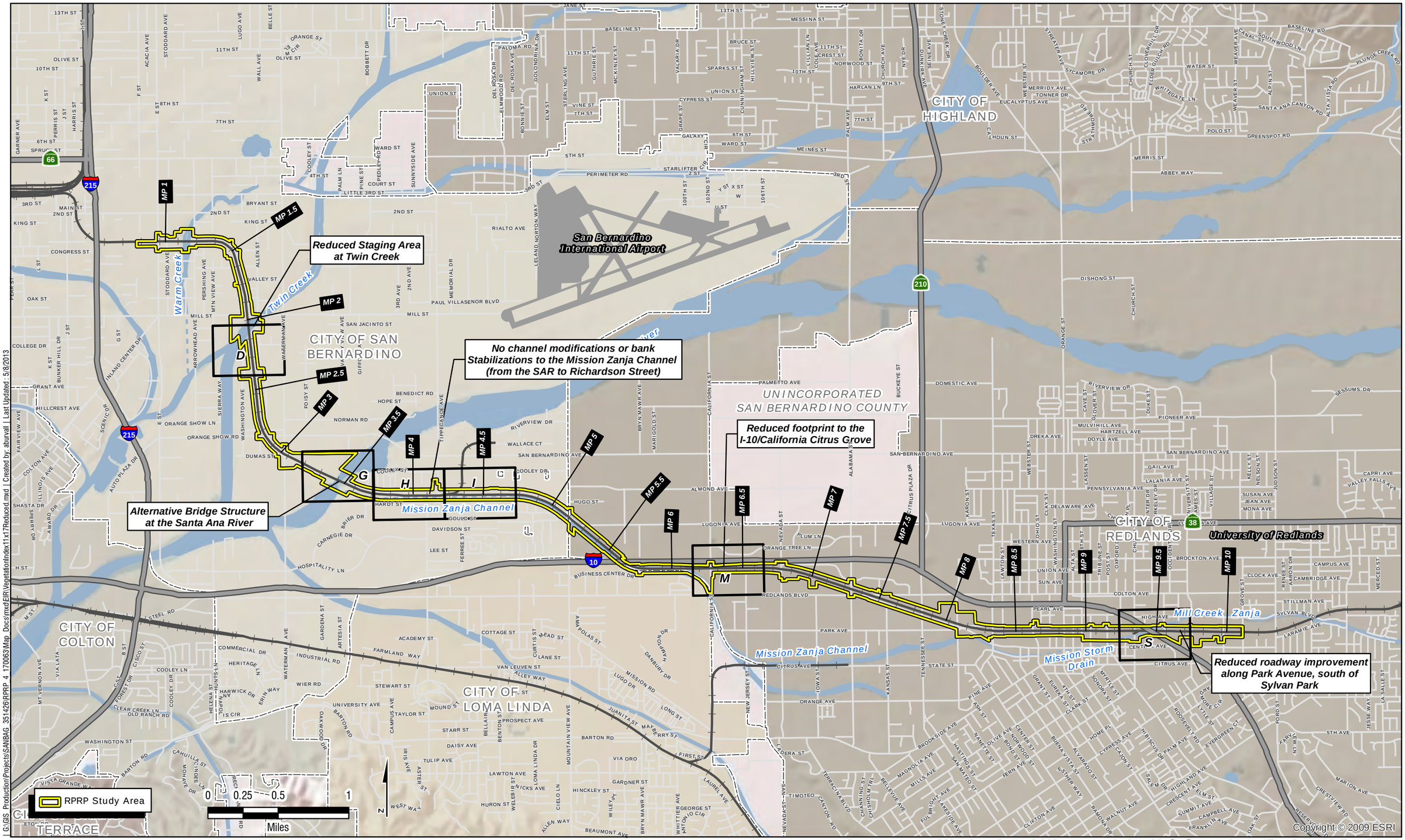

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Impacts on Wetland and Waters of the U.S Overview (Reduced Project)

Figure 7

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

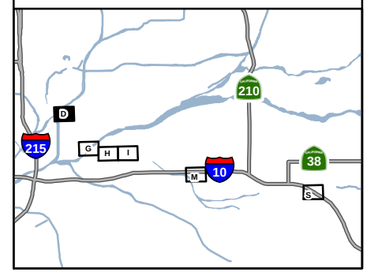
CDFW

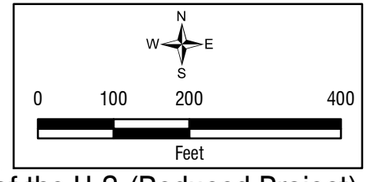
USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit





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Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7 D

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

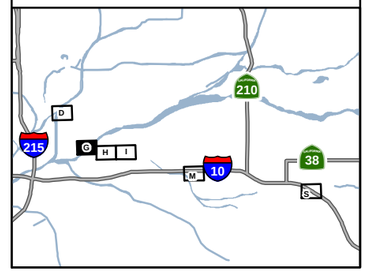
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7 G

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

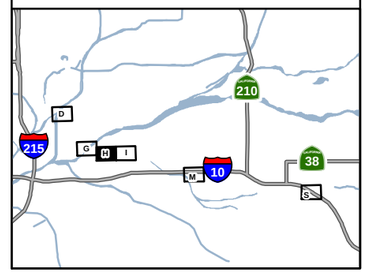
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Feet

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Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7 H

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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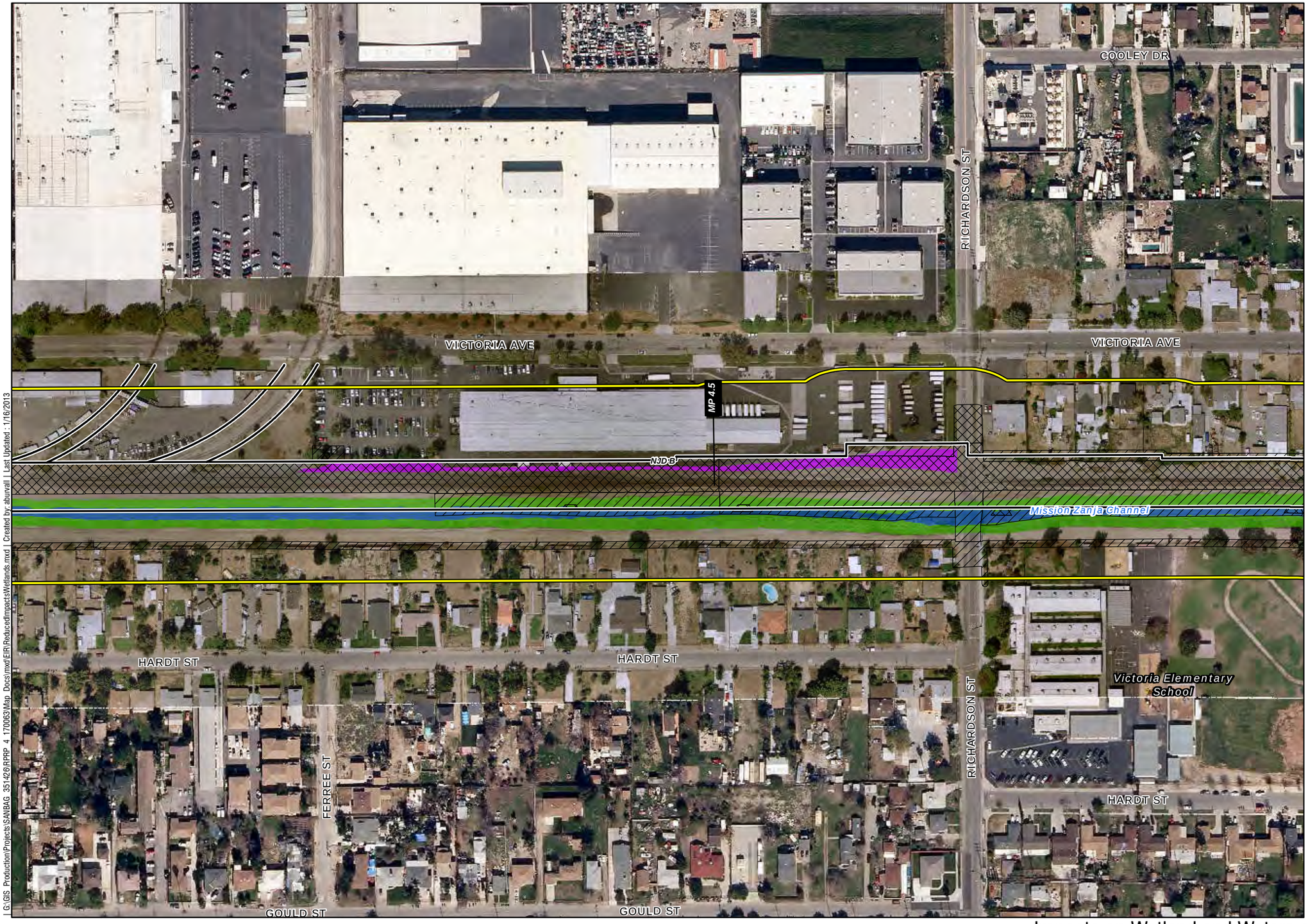


RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

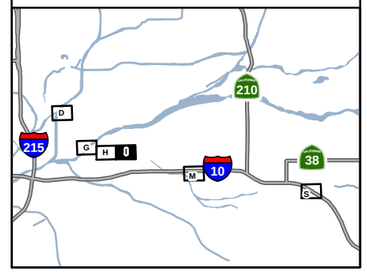
CDFW

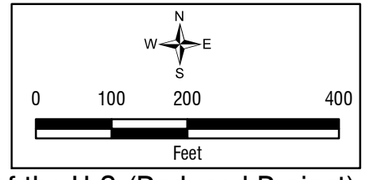
USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit





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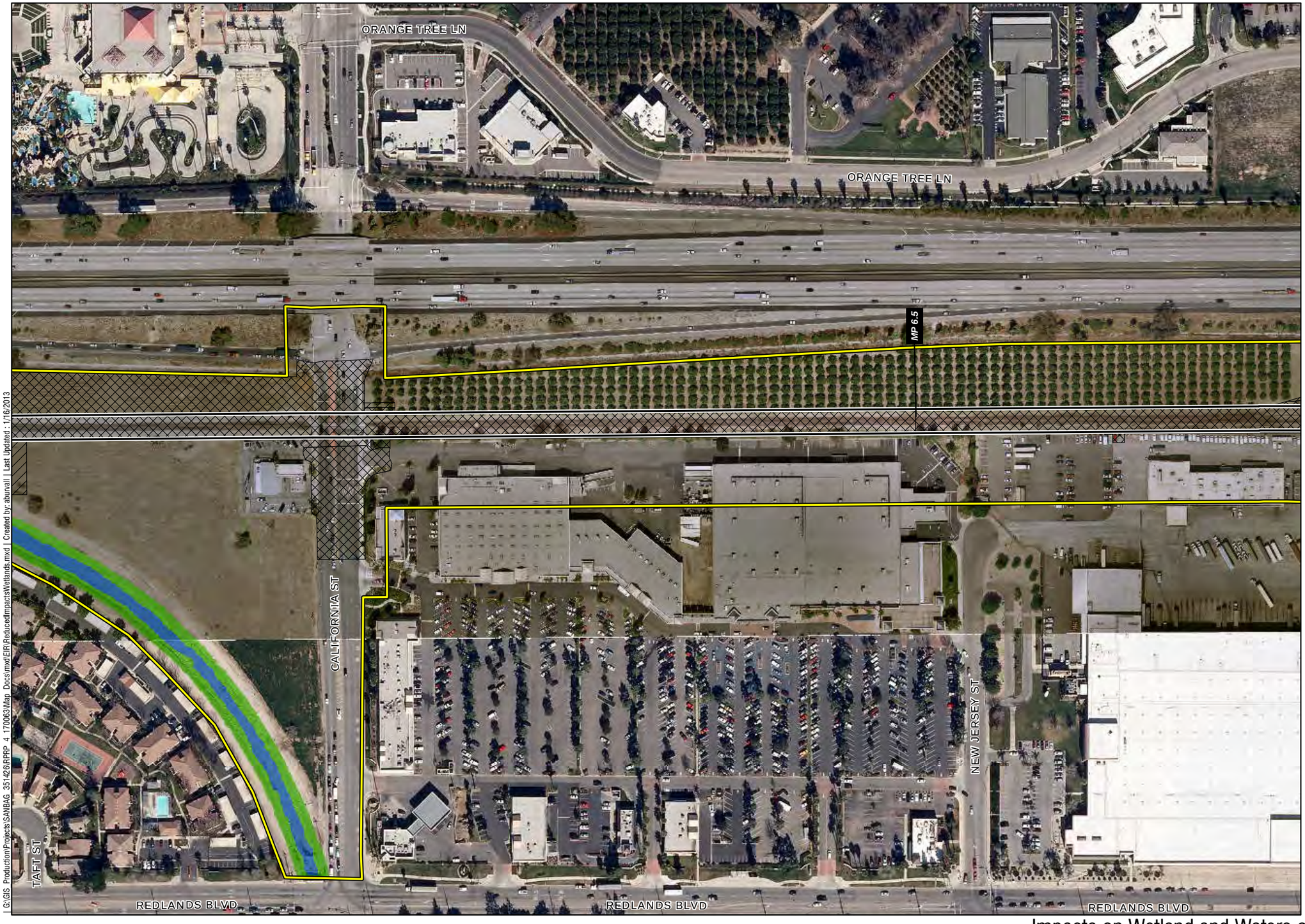
Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7I



RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

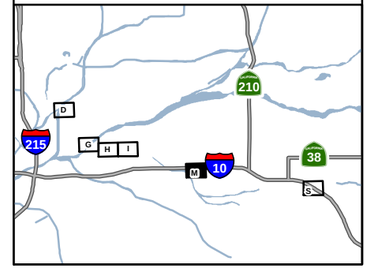
CDFW

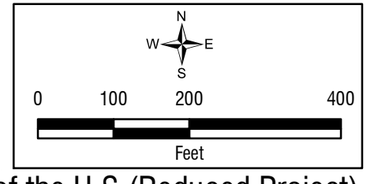
USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit





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Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7 M

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

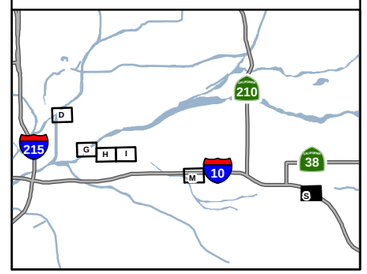
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7 S

FTA/SANBAG | Redlands Passenger Rail Project | BTR

APPENDIX B

Survey Summary Table

APPENDIX B

Survey Summary Table

Survey Type	Surveyors	Date	Time	Percent Cloud Cover		Temperature		Winds
				Start	End	Start	End	(mph)
Wetland Delineation	AS/SH	2/7/2012	0900-1615	0	0	64	68	0 - 1
Wetland Delineation	AS/SH	2/8/2012	0800-1445	ND	ND	ND	ND	ND
Wetland Delineation	AS/SH	2/22/2012	1000-1600	<10	<10	82	86	2 -5
Wetland Delineation/General Bio	AS/SH	2/23/2012	0830-1700	ND	ND	ND	ND	ND
General Biology/Vegetation Mapping	AN/SA	2/23/2012	0830-1700	ND	ND	ND	ND	ND
LBV #1	AS/AN	4/16/2012	0820-1115	0	0	63	75	1 - 2
LBV #2	AS/AN	4/27/2012	0730-1023	80	10	59	77	0-2
LBV #3	AS/AN	5/8/2012	0756-1050	0	0	65	87	0-4
LBV #4	JA	5/21/2012	0615-0950	0	0	65	82	1-1
LBV #5	JA	6/1/2012	0600-0925	0	0	63	73	1-1
LBV #6	JA	6/11/2012	0620-0945	0	0	63	70	2-1
LBV #7	JA	6/25/2012	0530-0855	0	0	53	62	1-3
LBV #8	JA	7/5/2012	0555-0900	20	20	59	70	2-2
BUOW burrow mapping	AS/AN	4/4/2012	1000-1700	70	0	76	80	0 - 2
BUOW burrow mapping	AS/AN	4/5/2012	0800-1145	20	<10	56	73	1 - 3
BUOW #1a	AS/AN	4/10/2012	0715-0900	0	10	68	62	0 - 1
BUOW #1b	AS/AN	4/10/2012	1730-1911	0	0	ND	86	0-3
BUOW #2a	AS/AN	5/7/2012	1720-1930	0	0	86	84	3 - 10
BUOW #2b	AS/AN/SA/JS	5/8/2012	1730-1815	0	0	91	86	0 - 4
BUOW #3a	AS/AN	6/4/2012	1747-1930	0	0	ND	76	1-6
BUOW #3b	AS/AN	6/5/2012	0745-0957	0	0	ND	66	0-3
BUOW #4a	SH	7/9/2012	1800-2000	0	0	ND	100	3-4
BUOW #4b	SH	7/10/2012	0546-0746	15	15	ND	70	0
BUOW #4c	SH	7/10/2012	1803-1943	15	15	ND	107	2-4
BUOW #4d	SH	7/11/2012	0625-0745	10	10	ND	73	3-6

Survey Type	Surveyors	Date	Time	Percent Cloud Cover		Temperature		Winds
				Start	End	Start	End	(mph)
Rare Plant	AS/AN/JS/SA	5/8/2012	1000-1700	0	0	ND	75	1-2
Rare Plant	AS/AN/JS/SA	5/9/2012	0800-1300	0	0	ND	75	1-2
Rare Plant	AS/AN	6/4/2012	1747-1930	0	0	ND	76	1-6
Rare Plant	AS/AN	6/5/2012	0745-0957	0	0	ND	66	0-3
Rare Plant	AS/DJ	6/12/2012	0830/1200	0	0	ND	80	0-3
Rare Plant	SH	7/9/2012	1800-2000	0	0	ND	100	3-4
Rare Plant	SH	7/10/2012	0546-0746	15	15	ND	70	0
Rare Plant	SH	7/10/2012	1803-1943	15	15	ND	107	2-4
Rare Plant	SH	7/11/2012	0625-0745	10	10	ND	73	3-6
SWIFL	JA	5/21/2012	0615-0950	0	0	65	82	1-1
SWIFL	JA	6/1/2012	0600-0925	0	0	63	73	1-1
SWIFL	JA	6/11/2012	0620-0945	0	0	63	70	2-1
SWIFL	JA	6/25/2012	0530-0855	0	0	53	62	1-3
SWIFL	JA	7/5/2012	0555-0900	20	20	59	70	2-2
SBKR	SL	5/18/2012	ND	50	ND	57	ND	0-2
SBKR	SL	5/19/2012	ND	50	ND	58	ND	0-2
SBKR	SL	20-May	ND	20	ND	57	ND	0-2
SBKR	SL	5/21/2012	ND	10	ND	60	ND	0-1
SBKR	SL	5/22/2012	ND	0	ND	63	ND	0-2
SBKR	SL	5/23/2012	ND	0	ND	60	ND	0-1

Surveyor Legend:

AN Aaron Newton
AS Allegra Simmons
DJ Dustin Janeke
JA Jeff Ahrens
JS Joseph Schroeder
SA Summer Adleberg
SH Sean Harris
SL Shay Lawrey
ND No Data

APPENDIX C

Botanical Species Observed

APPENDIX C
Observed Botanical Species

Family	Scientific Name	Common Name
Vascular Plants		
Asteraceae		**Sunflower Family**
	Ambrosia psilostachya	Western ragweed
	Artemisia californica	California sagebrush
	Artemisia douglasiana	Mugwort
	Artemisia dracunculus	Tarragon
	Baccharis salicifolia	mulefat
	Baccharis sarothroides	Broom baccharis
	Bidens pilosa	Common beggar's tick
	Carduus pycnocephalus	Italian thistle
	Centaurea benedicta	Blessed thistle
	Centaurea melitensis	tocalote
	Chamomilla suaveolens	common pineapple weed
	Cirsium arvense	Canada thistle
	Cirsium sp.	thistle
	Conyza bonariensis	Flax leaved horseweed
	Conyza canadensis	common horseweed
	Conyza sp.	Horseweed species
	Encelia farinosa	brittlebush
	Gazania linearis	Gazania
	Gnaphalium canescens ssp. beneolens	fragrant everlasting
	Helianthus sp.	sunflower
	Helianthus annuus	common sunflower
	Heterotheca grandiflora	Telegraph weed
	Heterotheca sp.	Telegraph weed
	Heterotheca villosa	Hairy false goldenaster
	Lactuca serriola	prickly lettuce
	Lepidospartum squamatum	Scale broom
	Solidago occidentalis	western goldenrod
	Sonchus asper	Prickly sow-thistle
	Xanthium strumarium	cocklebur
Brassicaceae		**Mustard Family**
	Brassica geniculata	shortpod mustard
	Brassica nigra	Black Mustard
	Sisymbrium altissimum	Tumble mustard
	Sisymbrium irio	London rocket

Family	Scientific Name	Common Name
Chenopodiaceae		**Goosefoot Family**
	Chenopodium album	Lamb's Quarters
	Kochia sp.	Red sage species
	Salsola iberica	Russian thistle
	Salsola tragus	Russian thistle
Euphorbiaceae		**Spurge Family**
	Croton californicus	California croton
	Ricinus communis	castor bean
Fabaceae		**Legume Family**
	Acacia redolans	bank catclaw
	Acacia sp.	Acacia species
	Cercidium microphyllum	palo verde
	Lotus heermannii	Woolly Lotus
	Lotus scoparius	Deer weed
	Lotus strigosus	Strigose lotus
	Lupinus hirsutissimus	Stinging Lupine
	Lupinus truncates	Collar Lupine
	Medicago sativa	alfalfa
	Melilotus sp.	Clover species
	Melilotus indicus	sourclover
	Parkinsonia aculeate	Mexican palo verde
	Spartium junceum	Spanish broom
	Vicia villosa	Winter vetch
Geraniaceae		**Geranium Family**
	Erodium sp.	filaree
Malvaceae		**Mallow Family**
	Malva parviflora	cheeseweed
Myrtaceae		**Myrtle Family**
	Eucalyptus sp.	eucalyptus
Oleaceae		**Olive Family**
	Fraxinus sp.	ash
	Fraxinus uhdei	Shamel ash
	Olea sp.	Olive species
Tamaricaceae		**Tamarisk Family**
	Tamarix ramosissima	Mediterranean tamarisk
	Tamarix sp.	tamarisk

Family	Scientific Name	Common Name
Solanaceae		**Nightshade Family**
	Datura wrightii	jimson weed
	Nicotiana glauca	tree tobacco
	Solanum douglasii	Douglas' nightshade
Vitaceae		**Grape Family**
	Parthenocissus inserta	Virginia creeper
	Vitis girdiana	desert wild grape
Zygophyllaceae		**Caltrop Family**
	Tribulus terrestris	puncture vine
Arecaceae		**Palm Family**
	Washingtonia sp.	fan palm
	Washingtonia robusta	Mexican fan palm
Poaceae		**Grass Family**
	Agrostis viridis	Water bentgrass
	Arundo donax	Giant reed
	Avena sp.	Oat species
	Bromus diandrus	ripgut brome
	Bromus hordeaceus	soft chess
	Bromus madritensis ssp. *rubens*	red brome
	Cynodon dactylon	Bermuda grass
	Digitaria sanguinalis	crab grass
	Distichlis spicata	salt grass
	Eragrostis sp.	Lovegrass species
	Festuca arundinacea	Tall fescue
	Hordeum murinum	false barley
	Leptochloa uninervia	mexican sprangletop
	Lolium perenne	Perennial ryegrass
	Lolium sp.	Ryegrass Species
	Muhlenbergia asperifolia	Scratch grass
	Paspalum dilatatum	Dallis grass
	Pennisetum ciliare	Buffelgrass
	Phalaris arundinacea	Reed canary grass
	Polypogon interruptus	Beard grass
	Polypogon monspeliensis	Rabbitsfoot grass
	Schismus barbatus	Mediterranean schismus
	Setaria gracilis	Knotroot bristlegrass
	Sorghum halepense	Johnsongrass
	Sporobolus indicus	smutgrass
	Vulpia octoflora	Six weeks fescue

Family	Scientific Name	Common Name
Plantaginaceae		**Plantain Family**
	Plantago lanceolata	english plantain
	Plantago major	Common plantain
Cyperaceae		**Sedge Family**
	Cyperus eragrostis	Tall umbrella-sedge
	Cyperus involucratus	Umbrella-sedge
Polygonaceae		**Buckwheat Family**
	Eriogonum fasciculatum	California buckwheat
	Eriogonum thurberi	Thurber's Buckwheat
	Rumex crispus	Curly Dock
	Polygonum arenastrum	Common knotweed
	Polygonum lapathifolium	Willow weed
Scrophulariaceae		**Figwort Family**
	Mimulus guttatus	spotted monkey flower
	Verbascum thapsus	Woolly mullein
	Verbascum virgatum	Wand mullein
	Veronica anagallis-aquatica	great water speedwell
Moraceae		**Mulberry and Fig Family**
	Ficus carica	Edible Fig
	Morus	Mulberry
	Morus alba	White mulberry
Rosaceae		**Rose Family**
	Heteromeles arbutifolia	toyon
	Rubus discolor	Himalayan blackberry
Polemoniaceae		**Woolly Stars**
	Eriastrum densifolium ssp. *sanctorum*	Santa Ana River woolly star
	Eriastrum sapphirinum	Sapphire woolly star
Convolvulaceae		**Morning Glory**
	Calystegia macrostegia	California bindweed
	Convolvulus arvensis	Bindweed
	Cuscuta subinclusa	Canyon dodder
Boraginaceae		**Borage Family**
	Amsinckia menziesii var. *intermedia*	common fiddleneck
	Cryptantha intermedia	Common Cryptantha
	Cryptantha sp.	Cat's eye
	Eriodictyon trichocalyx	Yerba santa
	Heliotropium curassavicum	Chinese purslane

Family	Scientific Name	Common Name
Cucurbitaceae		**Gourd Family**
	Cucurbita foetidissima	Wild gourd
Simaroubaceae		**Quassia Family**
	Ailanthus altissima	tree of heaven
Apocynaceae		**Dogbane Family**
	Apocynum cannabinum	Dogbane hemp
Hydrophyllaceae		**Waterleaf Family**
	Phacelia distans	Common phacelia
	Phacelia minor	California bluebells
	Phacelia ramosissima	Branching Phacelia
	Phacelia sp.	bluebells
Salicaceae		**Willow Family**
	Populus fremontii	Fremont cottonwood
	Populus fremontii subsp. fremontii	western cottonwood
	Salix exigua	Sandbar willow
	Salix gooddingii	black willow
	Salix laevigata	Red willow
	Salix lasiolepis var. *lasiolepis*	Arroyo willow
	Salix lucida spp. lasiandra	Pacific willow
Apiaceae		**Carrot Family**
	Anthriscus caucalis	Burr chervil
	Conium maculatum	common poison-hemlock
Rubiaceae		**Madder Family**
	Galium aparine	common bedstraw
Lamiaceae		**Mint Family**
	Marrubium vulgare	Horehound
	Mentha sp.	Mint
	Salvia columbariae	Chia
	Salvia mellifera	Black sage
Urticaceae		**Nettle Family**
	Urtica urens	Orchard nettle
Cactaceae		**Cactus Family**
	Opuntia littoralis	coastal prickly pear
Rhamnaceae		**Buckthorn Family**
	Rhamnus californica	California coffeeberry
Primulaceae		**Primrose Family**
	Anagallis arvensis	Scarlet pimpernel
	Ceanothus leucodermis	Chaparral whitethorn

Family	Scientific Name	Common Name
Verbenaceae		**Vervain Family**
	Lantan sp.	Lantana
Viscaceae		**Mistletoe Family**
	Phoradendron macrophyllum	Big leaf mistletoe
	Phoradendron sp.	Mistletoe
Agavaceae		**Agave Family**
	Spanish bayonet	Yucca whipplei
	Yucca	Ornamental yucca
Simaroubaceae		**Quassia Family**
	Ailanthus altissima	tree of heaven
Typhaceae		**Cattail Family**
	Typha domingensis	Southern cattail
	Typha latifolia	Common or broad-leaved cattail
	Typha sp.	Cattail species
Onagraceae		**Evening Primrose Family**
	Camissonia bistorta	California sun cup
	Epilobium ciliatum	Green willow herb
	Oenothera elata	Great marsh evening primrose
Platanaceae		**Sycamore Family**
	Platanus racemosa	Western sycamore
Adoxaceae		**Muskroot Family**
	Sambucus mexicana	Mexican elderberry
Anacardiaceae		**Sumac or Cashew Family**
	Schinus terebinthifolius	Brazilian pepper tree
Lythraceae		**Loosestrife Family**
	Lythrum californicum	California loosestrife

APPENDIX D

Zoological Species Observed

APPENDIX D
Zoological Species Observed

Family	Scientific Name	Common Name
Birds		
Accipitridae		**Hawks and Eagles**
	Accipiter cooperii	Cooper's hawk
	Buteo jamaicensis	red-tailed hawk
Aegithalidae		**Bushtit**
	Psaltriparus minimus	bushtit
Anatidae		**Ducks, Geese and Swans**
	Anas platyrhynchos	mallard
	Branta canadensis	Canadian goose
Ardeidae		**Herons and Bitterns**
	Bubulcus ibis	cattle egret
	Butorides virescens	green heron
Cardinalidae		**Cardinals, Grosbeaks, and Allies**
	Pheucticus melanocephalus	black-headed grosbeak
	Piranga ludoviciana	western tanager
Cathartidae		**New World Vultures**
	Cathartes aura	turkey vulture
Charadriidae		**Plover and Relatives**
	Charadrius vociferus	killdeer
Columbidae		**Pigeons and Doves**
	Columba livia	rock pigeon
	Streptopelia decaocto	Eurasian collared dove
	Zenaida macroura	mourning dove
Corvidae		**Jays, Magpies and Crows**
	Aphelocoma californica	western scrub jay
	Corvus brachyrhynchos	American crow
	Corvus corax	common raven
Emberizidae		**Emberizines**
	Amphispiza bilineata	Black-throated Sparrow
	Melospiza melodia	Song Sparrow
	Melozone crissalis	California towhee
	Pipilo maculates	spotted towhee
	Zonotrichia leucophrys	white-crowned sparrow

Family	Scientific Name	Common Name
Falconidae		**Falcons**
	Falco sparverius	American kestrel
Fringillidae		**Finches**
	Carpodacus mexicanus	house finch
	Spinus psaltria	lesser goldfinch
Hirundinidae		**Swallows**
	Stelgidopteryx serripennis	northern rough-winged swallow
	Hirundo rustica	barn swallow
Icteridae		**Blackbirds, Orioles, and Allies**
	Euphagus cyanocephalus	Brewer's blackbird
	Icterus bullockii	Bullock's oriole
	Icterus cucullatus	hooded oriole
	Sturnella neglecta	western meadowlark
Laniidae		**Shrikes**
	Lanius ludovicianus	loggerhead shrike
Mimidae		**Mockingbirds and Thrashers**
	Mimus polyglottos	Northern Mockingbird
	Toxostoma redivivum	California thrasher
Odontophoridae		**New World Quails**
	Callipepla californica	California quail
Parulidae		**Wood Warblers and Relatives**
	Cardellina pusilla	Wilson's warbler
	Geothlypis trichas	common yellowthroat
	Oreothlypis celata	orange-crowned warbler
	Setophaga coronata	yellow-rumped warbler
	Setophaga petechia	yellow warbler
Passeridae		**Old World Sparrows**
	Passer domesticus	house sparrow
Picidae		**Woodpeckers and Wrynecks**
	Colaptes auratus	northern flicker
	Picoides nuttallii	Nuttal's woodpecker
Ptilogonatidae		**Silky Flycatchers**
	Phainopepla nitens	phainopepla
Rallidae		**Rails**
	Fulica americana	American coot
Regulidae		**Kinglets and Firecrests**
	Regulus calendula	ruby-crowned kinglet

Family	Scientific Name	Common Name
Sturnidae		**Starlings and Allies**
	Sturnus vulgaris	European starling
Timaliidae		**Tree Babblers**
	Chamaea fasciata	wrentit
Trochilidae		**Hummingbirds**
	Archilochus alexandri	black-chinned hummingbird
	Calypte anna	Anna's hummingbird
	Selasphorus sasin	Allen's hummingbird
Troglodytidae		**Wrens**
	Thryomanes bewickii	Bewick's wren
	Troglodytes aedon	house wren
Turdidae		**Thrushers**
	Turdus migratorius	American robin
Tyrannidae		**Tyrant Flycatchers**
	Empidonax difficilis	Pacific-slope flycatcher
	Myiarchus cinerascens	ash-throated flycatcher
	Sayornis nigricans	black phoebe
	Tyrannus verticalis	western kingbird
	Sayornis saya	Say's phoebe
	Tyrannus vociferans	Cassin's kingbird
Vireonidae		**Vireos**
	Vireo bellii pusillus	least Bell's vireo
	Vireo gilvus	warbling vireo
Mammals		
Rodentia		**Rodents**
	Chaetodipus fallax fallax	San Diego pocket mouse
	Dipodomys simulans	Dulzura kangaroo rat
	Neotoma lepida	desert wood rat
	Peromyscus eremicus	cactus mouse
	Peromyscus maniculatus	deer mouse
	Spermophilus beecheyi	California ground squirrel
Leporidae		**Rabbits and Hares**
	Sylvilagus audubonii	desert cottontail
Felidae		**Cats**
	Felis domesticus	domestic cat
Canidae		**Dog**
	Canis latrans	coyote
	Canis lupis familiaris	domestic dog

Family	Scientific Name	Common Name
Procyonidae		**Raccoon Family**
	Procyon lotor	raccoon
Reptiles		
	Sceloporus occidentalis	western fence lizard
	Uta stansburiana	side-blotched lizard
Amphibians		
	Pseudacris regilla	Pacific tree frog
Insects		
	Junonia coenia	common buckeye
	Nymphalis antiopa	mourning cloak
	Papilio rutulus	western tiger swallowtail
	Pieris rapae	cabbage white
	Pontia protodice	checkered white

APPENDIX E

Potential Sensitive Botanical Species

APPENDIX E

Potential Sensitive Botanical Species

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Asteraceae			
smooth tarplant *Centromadia pungens* ssp. *laevis*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in valley and foothill grasslands, particularly near alkaline locales. Sites with minimal shrub cover. From 0 to 1,600 feet in elevation	High – suitable habitat occurs throughout the project area. An individual plant was observed within the ROW in 2009. The species was not observed within the survey area during 2012 rare plant surveys.
Brassicaceae			
Robinson's pepper-grass *Lepidium virginicum var. robinsonii*	Federal: None State: None CNPS: 1B.2	Annual herb. Occurs in chaparral and sage scrub below 2,000 feet in elevation	None – project area does not support suitable habitat CNDDB data identifies the survey area within the species' occurrence territory along the Historic Warm Creek. However the most recent record of an elemental occurrence in the Survey Area was 1889.
Gambel's water cress *Nasturtium gambelii*	Federal: FE State: ST CNPS: 1B.1	Perennial herb. Occurs in marshes, streambanks, and lake margins below 4,800 feet in elevation	Low– project area supports potentially suitable habitat, however, there is a low occurrence of ponded or marshy areas within the project area. CNDDB data identifies the survey areas as within the species' occurrence territory. However, only three known populations occur in the state. The most recent record of an elemental occurrence in the survey area was 1935. The species was not observed within the survey area during 2012 rare plant surveys.
Cuscutaceae			
Peruvian dodder *Cuscuta obtusiflora*	Federal: None State: None CNPS: 2.2	Annual vine. Occurs in freshwater marshes and swamps below 900 feet in elevation.	None – project area does not support suitable habitat. CNDDB data identifies the survey area within the species' occurrence territory along the Historic Warm Creek. However the most recent record of an elemental occurrence in the survey area was 1890.

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Caryophyllaceae			
Marsh sandwort *Arenaria paludicola*	Federal: FE State: SE CNPS: 1B.1	Perennial herb. Occurs in boggy marshes and meadows below 1,200 feet in elevation	None – project area does not support suitable habitat. CNDDB data identifies the survey area within the species' occurrence territory. However the most recent record of an elemental occurrence in the survey area was 1899.
Fabaceae			
Horn's milk-vetch *Astragalus hornii* var. *hornii*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in salty flats, lake shores, alkali sink, wetland-riparian. From 190 to 500 feet in elevation.	Low– project area supports potentially suitable habitat. CNDDB data identifies the survey areas as within the species' occurrence territory. However the most recent record of an elemental occurrence in the survey area was 1898. The species was not observed within the survey area during 2012 rare plant surveys.
Grossulariaceae			
Parish's gooseberry *Ribes divaricatum var. parishii*	Federal: None State: None CNPS: 1A	Deciduous shrub. Occurs in riparian woodland. From 200 to 1,000 feet in elevation. (Presumed extinct).	None– project area supports potentially suitable habitat. However, the species is presumed extinct in California. CNDDB data identifies the survey area as within the species' occurrence territory. The most recent record of an elemental occurrence in the survey area was 1917.
Malvaceae			
Salt Spring checkerbloom *Sidalcea neomexicana*	Federal: None State: None CNPS: 2.2	Perennial herb. Occurs in creosote bush scrub, chaparral, sage scrub, yellow pine forest, alkali sink, and wetland riparian. From below 5,700 feet in elevation.	Moderate – project area supports potentially suitable habitat. CNDDB data identifies the survey area as within the species' occurrence territory. The species was not observed within the survey area during 2012 rare plant surveys.
Polygonaceae			
Santa Ana River woolly star *Eriastrum densifolium* ssp. *sanctorum*	Federal: Endangered State: Endangered CNPS List: 1B.1	Occurs in sandy or gravelly chaparral and coastal scrub (alluvial fan).	High – An individual plant was observed within a portion of the survey area located within the SAR during 2012 rare plant surveys.

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Slender-horned spineflower *Dodecahema leptoceras*	Federal: FE State: SE CNPS: 1B.1	Annual herb. Occurs in alluvial sand and coastal scrub. From 700 to 2,700 feet in elevation.	Moderate – project area supports potentially suitable habitat. CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1983. The species was not observed within the survey area during 2012 rare plant surveys.
Poaceae			
California satintail *Imperata brevifolia*	Federal: None State: None CNPS: 2.1	Perennial herb. Occurs in wet springs, meadows, streamsides, and flood plains. Will also occur in non-wetlands. From below 1,900 feet in elevation.	Low – the project area supports potentially suitable habitat CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1904. The species was not observed within the survey area during 2012 rare plant surveys.
Prairie wedge grass *Sphenopholis obtusata*	Federal: None State: None CNPS:2.2	Perennial herb. Occurs in Cismontane woodland, meadows and seeps. From 6,500 feet in elevation.	None – project area does not support suitable habitat CNDDB data identifies the survey area as within the species' occurrence territory along the SAR. However the most recent record of an elemental occurrence in the Survey Area was 1904.
Scrophulariaceae			
salt marsh bird's-beak *Cordylanthus maritimus ssp. maritimus*	Federal: FE State: SE CNPS: 1B.2	Annual herb (hemiparasitic). Occurs in coastal salt-marsh, dunes, and wetlands. From below 38 feet in elevation.	None – project area does not support suitable habitat CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1888.

FE = Federally Endangered.
FT = Federally Threatened
SE = State Endangered
ST = State Threatened
CNPS = California Native Plant Society listing.
List 1B.2 = List 1b: Rare, threatened, or endangered in California and elsewhere. 0.2: Fairly endangered in California.
List 2.3 = List 2: Rare, threatened, or endangered in California, but more common elsewhere. O.3: Not very endangered in California.
List 4.2 = Limited distribution (Watch list). 0.2: Fairly endangered in California.
List 4.3 = Limited distribution (Watch list). 0.3: Not very endangered in California.
List A = Plants rare, threatened or endangered in California and elsewhere.
List B = Plants rare, threatened or endangered in California but more common elsewhere.

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APPENDIX F

Potential Sensitive Zoological Species

APPENDIX F

Potential Sensitive Zoological Species

Species	Sensitivity Status	Preferred Habitat	Observed On-Site	Potential for Occurrence
Invertebrates				
Delhi Sands flower-loving fly *Rhaphiomidas terminatus abdominalis*	FE	Fine, sandy soils, often with wholly or partly consolidated dunes. Restricted to a particular soil type classified as the 'Delhi' series.	No	None- The project site lacks appropriate soils. CNDDB data identifies the survey area as within the species' occurrence territory.
Fish				
Santa Ana Sucker *Catostomus santaanae*	FT, SSC	Slight to swift flowing perennial streams with water depths ranging from a few inches to several feet.	No	Moderate – the project area supports suitable habitat.
Amphibians				
Western spadefoot toad *Spea hammondii*	SSC	Open areas with sandy or gravelly soils, often found in woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, floodplains, alluvial fans, playas, alkali flats, foothills and in mountain areas.	No	Moderate –Suitable habitat occurs within the project area.
Reptiles				
Coast horned lizard *Phrynosoma blainvillii*	SSC	Coastal sage scrub, grasslands, chaparral, oak woodland, riparian woodland and coniferous forest.	No	Low- marginal, fragmented habitat exists within the project area. CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1935.
Birds				
Western Burrowing Owl *Athene cunicularis hypugaea*	SSC	Open, dry annual or perennial grasslands, deserts and scrubland characterized by low-growing vegetation.	Yes	Moderate-breeding habitat occurs throughout the project area ranging in suitability from low to moderate. One transitory/wintering individual was observed within the Survey Area in January 2013.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	Federal candidate for listing, SE	Deciduous riparian woodland, especially including dense stands of cottonwood and willow, but also including mesquite and tamarisk in some	No	Moderate – The riparian forest habitat associated with the SAR and Mission Zanja Channel provides suitable breeding habitat. CNDDB

Species	Sensitivity Status	Preferred Habitat	Observed On-Site	Potential for Occurrence
		areas.		data identifies the survey area as within the species' occurrence territory along Twin Creek and the SAR. The species was not observed during 2012 southwestern willow flycatcher and least Bell's vireo protocol surveys.
Southwestern willow flycatcher (*Empidonax traillii extimus*)	FE, ST	Dense riparian habitat along streams, rivers, lakesides, and other wetland habitats.	No	Moderate – The riparian forest habitat associated with the SAR and Mission Zanja Channel provides suitable breeding habitat. The species was not observed during 2012 southwestern willow flycatcher and least Bell's vireo protocol surveys.
Least Bell's vireo *Vireo bellii pusillus*	FE, SE	Dense brush and mesquite associated with riparian systems, willow-cottonwood forest, and streamside thickets.	Yes	High– several individuals were observed within the survey area.
Loggerhead shrike (*Lanius ludovicianus)*	SSC	Inhabits open brushy areas, meadows, pastures, orchards, thickets along roads, and hedges.	Yes	High – the species was observed within the survey area.
Yellow breasted chat (*Icteria virens*)	SSC-Breeding	Breeding habitat includes early successional riparian habitats with well-developed shrub layer and open canopy.	No	High – Suitable habitat occurs within the survey area.
Yellow warbler (*Dendroica petechia*)	SSC	Inhabits riparian areas, or strips of riparian habitat in foothills.	Yes	High – the species was observed within the survey area.
Mammals				
San Bernardino kangaroo rat *Dipodomys merriami parvus*	FE, SSC	Alluvial sage scrub on alluvial fans, flood plains, along washes, and in adjacent upland areas.	No	Moderate –Suitable habitat occurs within the project area. CNDDB data identifies the survey area as within the species' occurrence territory. The most recent record of an elemental occurrence in the Survey Area was 1993.
Stephens' kangaroo rat *Dipodomys stephensi*	FE,ST	Primarily annual and perennial grasslands, but also occurs in coastal scrub and sagebrush with sparse canopy cover.	No	None –Suitable habitat occurs within the project area but the project is not within the range of the species.

Species	Sensitivity Status	Preferred Habitat	Observed On-Site	Potential for Occurrence
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	SSC	Open areas or semi-open country, typically in grasslands, agricultural fields or sparse coastal scrub.	No	None – The project site lacks suitable habitat for this species. CNDDB data identifies the survey area as within the species' occurrence territory.
Western yellow bat *Lasiurus xanthinus*	SSC	Roosts and feeds in, and near, palm oases and riparian habitats. Known to occur in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Generally roost in palms.	No	Low – Appropriate roosting habitat on-site. Not detected during biological surveys. CNDDB data identifies the survey area as within the species' occurrence territory.
Pallid bat *Antrozous pallidus*	SSC	Abandoned buildings for roosting and arid habitat types for foraging.	No	Low – Appropriate roosting habitat on-site. However, the species is not typically found in heavily developed areas. CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1929.
Pocketed free-tailed bat *Nyctinomops femorosaccus*	SSC	Prominent on cliffs and cliff faces.	No	None – lack of appropriate habitat. CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1985.
American badger *Taxidea taxus*	SSC	Arid, open habitats, grasslands, savannahs, mountain meadows, and desert scrub openings; needs friable soils for digging and open, uncultivated ground.	No	None - marginal, fragmented habitat exists within the project area. Not detected during general biological survey. CNDDB data identifies the survey area as within the species' occurrence territory.

FE = Federally Endangered.
FT = Federally Threatened
SE = State Endangered
ST = State Threatened
SSC = State Species of Concern
CFP = California Department of Fish and Game Fully Protected
BCC = USFWS Birds of Conservation Concern

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APPENDIX G

Least Bell's Vireo Report

SANBAG
Redlands Passenger Rail Project
Least Bell's Vireo Survey Report

October 2012

Prepared for

San Bernardino Associated Governments
1170 W. 3rd Street, 2nd Floor
San Bernardino, California 92410

Prepared by

HDR Engineering, Inc.
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San Diego, California 92123

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HDR

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1.0 EXECUTIVE SUMMARY

This report details the results of a focused least Bell's vireo (*Vireo bellii pusillus;* LBV) survey for the proposed Redlands Passenger Rail Project (project). The project would include the development of new railroad infrastructure along an approximate nine mile section rail corridor owned by SANBAG and would include the development of five stations consisting of boarding platforms with supporting amenities, parking and pedestrian access improvements, train layover/storage facilities with storage tracks, a vehicle wash, ancillary facilities, grading and drainage improvements, railroad signal improvements, replacement or improvements to five existing bridge structures and approximately two dozen at-grade highway-rail crossings.

2.0 SURVEY AND SITE DESCRIPTION

The survey area is located in the City of San Bernardino and within the San Bernardino South U.S. Geological Survey 7.5-minute quadrangle (Figures 1 and 2). The RPRP would involve the implementation rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. Figure 1 depicts the project location. A portion of the project area occurs within the Santa Ana River (SAR), which supports suitable nesting and foraging habitat for the federally endangered LBV. In summary, three non-mated males and one nested pair of LBV were observed within the survey area from April 16, 2012-July 5, 2012 (Figure 3).

3.0 PURPOSE OF STUDY

The purpose of the study is to determine if suitable habitat for LBV exists within the survey area, and if so, to conduct a presence/absence survey for the state and federally endangered LBV per the United States Fish and Wildlife Service (USFWS) protocol (USFWS 2001).

4.0 LEAST BELL'S VIREO STATUS AND BIOLOGY

The LBV is a federally and state of California listed endangered species. The species is small, averaging about 4.75 inches in length, with faint wing bars, an eye-ring or stripe, and is typically grey to light olive in color. A distinguishing characteristic of LBV is the flicking and bobbing of their relatively long tails (Sibley 2000). The species has a life span of up to seven years (USFWS 1998).

Historically the species was known to breed from as far south as San Fernando, Baja California to as far north as Tehama County in northern California (CDFG 2006). Currently, the LBV breeding range has been restricted to Southern California, with large breeding populations in Riverside and San Diego Counties. Small breeding populations are found in Santa Barbara and Ventura counties, and in northern Baja California, Mexico (CDFG 2006).

LBV generally occur in southern arroyo willow riparian forest and southern willow scrub habitats during the breeding season. Plant species associated with these habitats are Fremont cottonwood (*Populus fremontii*), arroyo willow (*Salix lasiolepis*), black willow (*Salix gooddingii*), willow shrubs (*Salix spp*.), and mulefat (*Baccharis salicifolia*). LBV winter in southern Baja California, Mexico, where they will occupy a variety of habitats including: mesquite scrub within arroyos, palm groves, and hedgerows bordering agricultural and residential areas (Kus 2002).

LBV generally conceal their nests in dense foliage and within one meter of the ground. Early to mid-successional riparian habitat is typically used for nesting by LBV because it supports the dense shrub cover required for nest concealment as well as a structurally diverse canopy for foraging (Kus 2002). LBV nests are typically constructed out of small pieces of bark, leaf fragments, pieces of soft plants, spider webs and other materials. LBV prefer to forage in lower to mid level canopy heights for bugs, beetles, moths, grasshoppers, and caterpillars.

The major threat to LBV populations has been nest parasitism by the brown-headed cowbird (BHC) (*Molothrus ater*) and loss of habitat due to animal grazing and human development. Due to aggressive conservation efforts, the status of the LBV is stable to increasing (CDFG 2006).

5.0 SURVEY METHODS AND LIMITATIONS

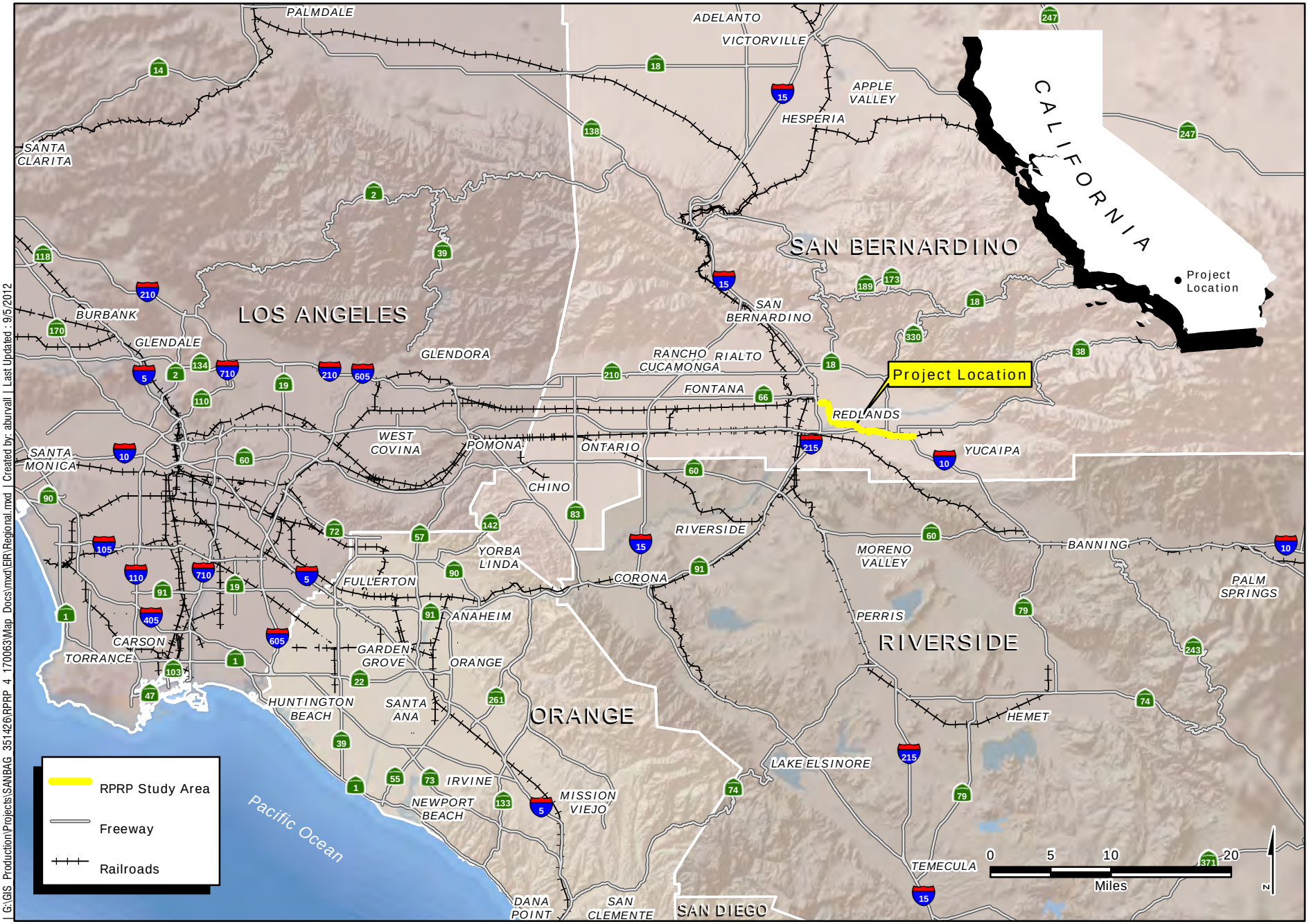
5.1 HABITAT ASSESSMENT

Prior to initiating protocol presence/absence surveys, vegetation communities within the survey area were assessed for suitability for LBV. Fourteen distinct vegetation communities occur within the 533.88-acre survey area (Figure 3, Table 1). Of the 14, two communities support habitat suitable for LBV nesting and foraging (Southern Cottonwood Willow Riparian Forest [SCWRF], Southern Willow Scrub [SWS]).

Table 1. Existing Vegetation within the Project Survey Area

Vegetation Communities	Survey Area Acreage
Disturbed Habitat	24.54
Disturbed Wetland	0.02
Eucalyptus Woodland	2.78
Flat-top Buckwheat Scrub (disturbed)	0.91
Mulefat Scrub	0.04
Non-Jurisdictional Ditch	1.31
Non-Native Grassland	61.90
Non-Vegetated Channel	29.22
Oak Woodland	9.62
Orchard and Vineyards	5.28
Southern Cottonwood Willow Riparian Forest	8.27
Southern Willow Scrub	0.64
Tamarisk Scrub	0.47
Urban/Developed	388.88
Total	533.88

Southern Cottonwood Willow Riparian Forest (SCWRF) is generally a tall, open, broadleafed winter-deciduous riparian forests dominated by Fremont cottonwood (*Populus fremontii)* and several willow species (*Salix* spp). This habitat occurs in sub-irrigated and frequently overflowed lands along rivers and streams. The dominant species require moist, bare mineral soil for germination and establishment. The understory is generally vegetated by herbaceous and viney species such as sedges (*Carex* sp.), grape (*Vitis* sp.), and introduced wetland species. Within the survey area, southern cotton wood riparian (SCWRF) occurs primarily within the western portion of Mission Zanja Channel and within the SAR.



Regional Location Map

Figure 1

FTA/SANBAG | Redlands Passenger Rail Project | LBV

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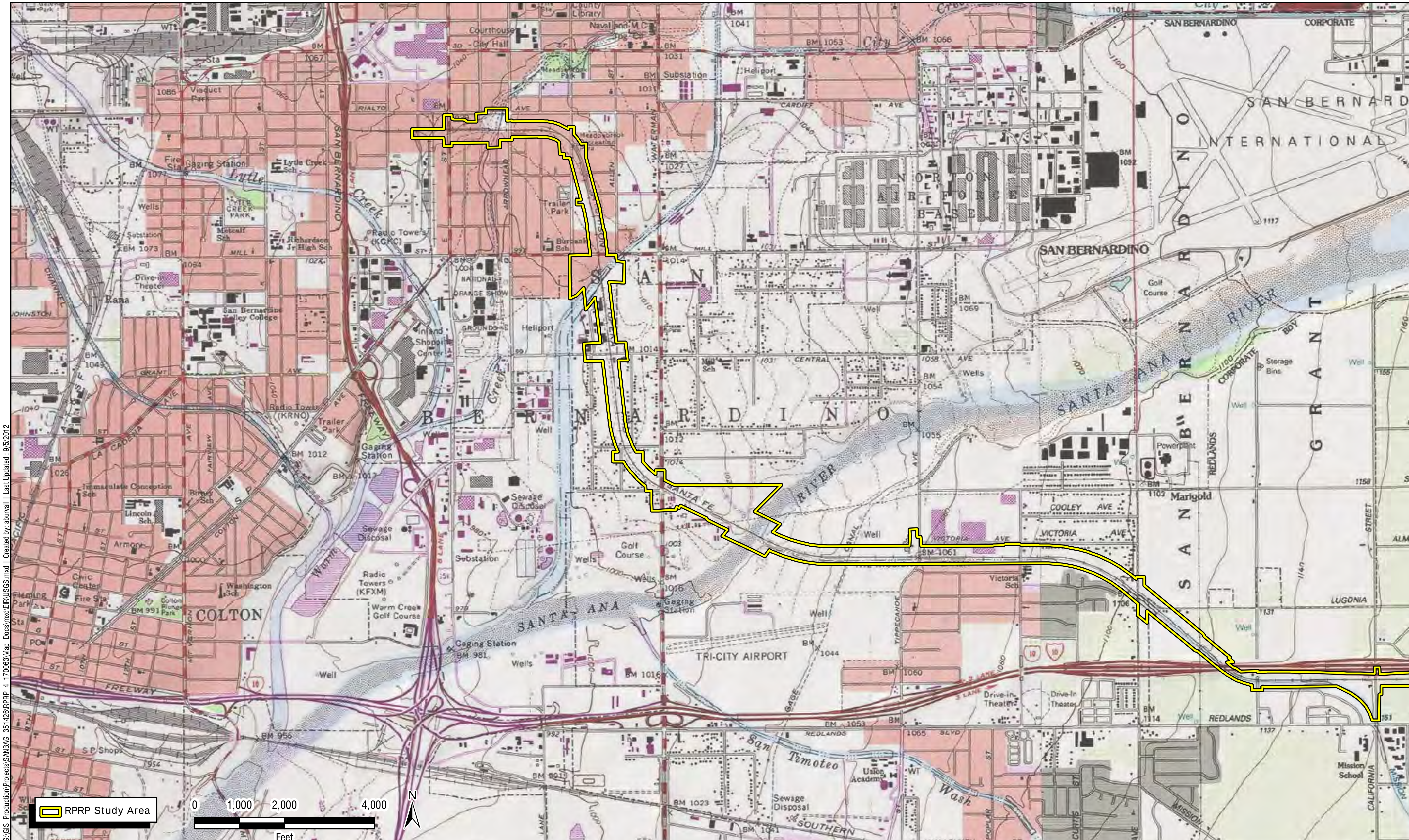

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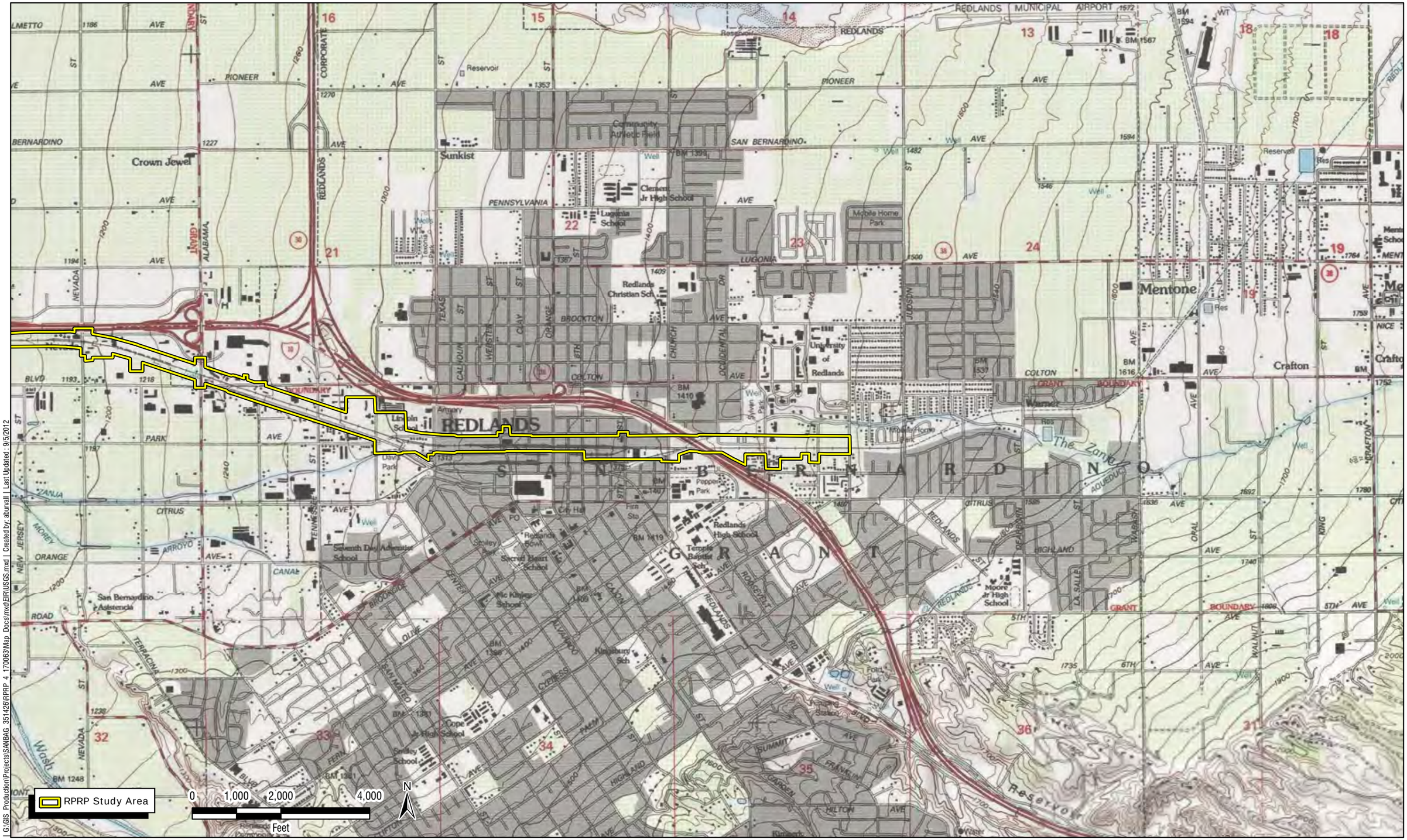
USGS Topographic Map

Figure 2a

FTA/SANBAG | Redlands Passenger Rail Project | LBV



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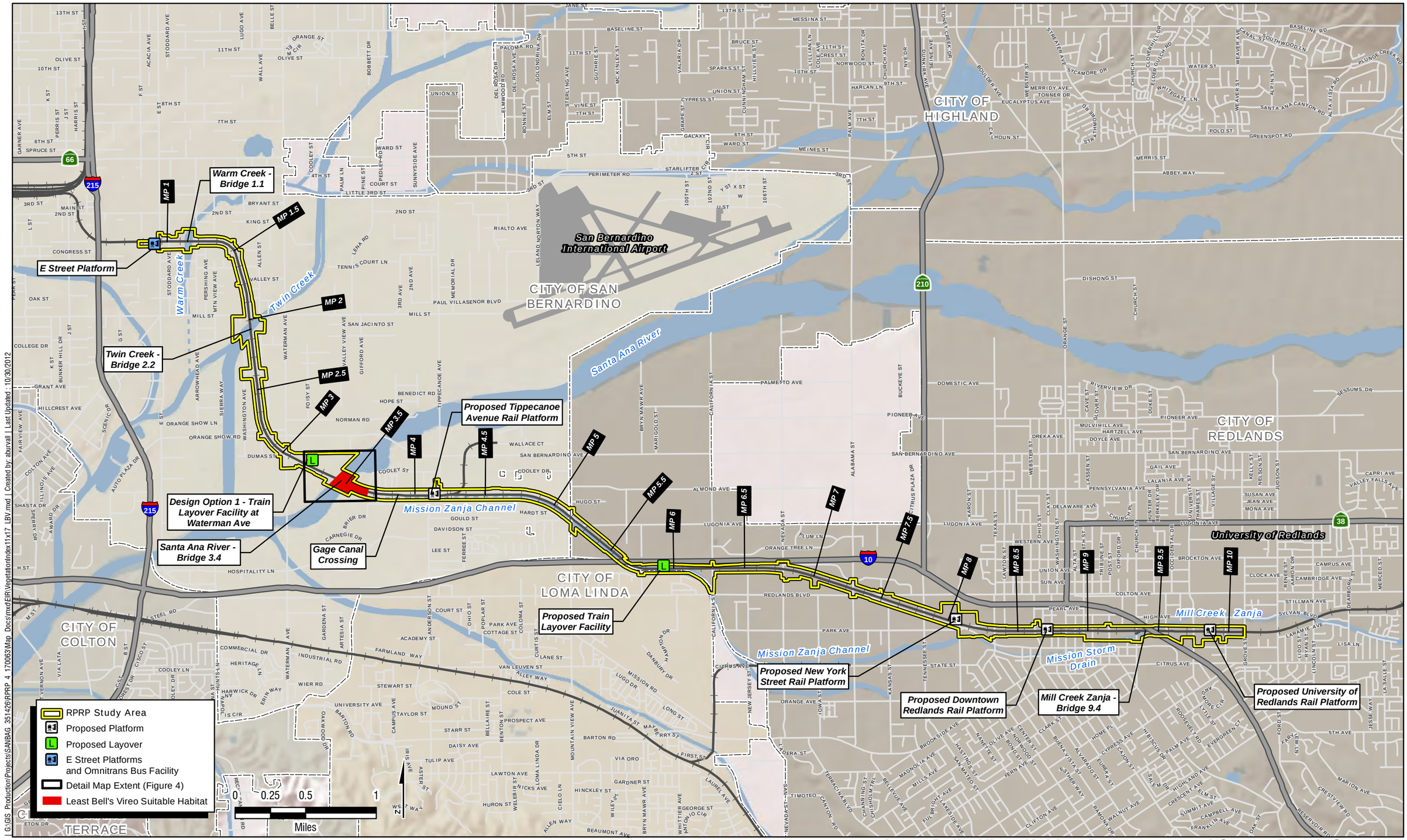
USGS Topographic Map

Figure 2b

FTA/SANBAG | Redlands Passenger Rail Project | LBV



Least Bell's Vireo Habitat Assessment and Survey Result Overview

Figure 3

FTA/SANBAG | Redlands Passenger Rail Project | LBV

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Southern willow scrub (SWS) generally consists of a dense thicket of various willow species (*Salix* spp.). This habitat occurs in loose, sandy alluvium near stream channels and is frequently flooded. The habitat is limited by the dense thicket of willows and frequent flooding which impacts the development of an understory. Within the survey area, SWS occurs as small patches within the SAR.

5.3 SURVEY METHODOLOGY

In accordance with the USFWS presence/absence survey protocols for the LBV (USFWS 2001), all appropriate riparian habitat located within the survey area was surveyed during each site visit. Within the nine-mile alignment, suitable habitat only occurs within the Santa Ana River (SAR) portion of the project. The survey was conducted by HDR biologists Allegra Simmons, Aaron Newton, and Glenn Lukos Associates (GLA) biologist Jeff Ahrens. Each of the eight focused survey visits were conducted at an interval of no less than 10 calendar days and between April10 and July 31. LBV were identified through visual and audible observations. Locations, activity, and number of individuals were noted during the site visits. In addition, all avian species observed were noted (Appendix A). All accessible portions of the survey area with appropriate habitat were surveyed on foot to allow for direct visual observation the habitat (Figure 3). Surveyors walked slowly and methodically during normal weather conditions conductive to bird activity (winds less then 15 mph, no rain and temperatures less then 95 F).

The protocol presence/absence surveys were conducted during morning hours (between 0530 and 1100 hours) under clear to morning overcast skies (0-80% cloud cover), with air temperatures between 59 and 87 degrees Fahrenheit, and with winds between 0 and 4 miles per hour (Table 2).

Table 2. Survey Dates, Times and Climatic Conditions

Surveyors	Survey Date	Times	Skies (% cloud cover)		Temperature		Winds (mph)
			Start	End	Start	End	
Allegra Simmons, Aaron Newton	4/16/2012	0820-1100	0	0	63°F	75°F	1-2
Allegra Simmons, Aaron Newton	4/27/2012	0730-1023	80	10	59°F	77°F	0-2
Allegra Simmons, Aaron Newton	5/08/2012	0756-1050	0	0	65°F	87°F	0-4
Jeff Ahrens	5/21/2012	0615-0950	0	0	65	82	0-1
Jeff Ahrens	6/01/2012	0600-0925	0	0	63	73	0-1
Jeff Ahrens	6/11/2012	0620-0945	0	0	63	70	1-2
Jeff Ahrens	6/25/2012	0530-0855	0	0	53	62	1-3
Jeff Ahrens	7/05/2012	0555-0900	20	20	59	70	1-2

6.0 SURVEY RESULTS

A diverse assemblage of 48 avian species was observed during the survey (Appendix A). These species are expected to occur within the urban and riparian habitat in the survey area. A common threat to LBV, brown-headed cowbirds (BHC) was not observed on site during the surveys. Other sensitive species observed during the surveys include the yellow warbler (*Setophaga petechia*), a California

Species of Concern, and an individual of Santa Ana River woolly-star (*Eriastrum densifolium spp. sanctorum*), which is federally endangered (Figure 3).

The USFWS protocol surveys included eight survey sessions conducted between April 16, 2011 and July 5, 2012 (Table 2). During the surveys, three individual male LBV and one pair were detected. Of these, Table 3 is a summary of each survey session.

Table 3. LBV Observations

Survey Date	LBV Observed
4/16/2012	1
4/27/2012	2
5/08/2012	1
5/21/2012	0
6/01/2012	4
6/11/2012	3
6/25/2012	3
7/05/2012	3

The following is a summary of each survey session. LBV locations referenced below can be found on Figure 3b.

On **April 16, 2012**, a single male LBV (LBV 1) was detected vocalizing in the SCWARF along the northeastern portion of the SAR; the location of the vocalization was approximately 600 feet northeast of Bridge 3.4.

On **April 27, 2012**, two separate males were detected vocalizing repeatedly in different locations. The first single male LBV (LBV 1) was heard calling/observed at 0843 hours, approximately 800 feet north of Bridge 3.4, along the east side of the SAR in the SWS. The male was followed south for approximately 200 feet as he continued calling. It is likely this is the same male (LBV 1) observed on April 16, 2012.

The second single male LBV (LBV2) was detected vocalizing repeatedly approximately 500 feet south of Bridge 3.4 along the east bank of the SAR around 0930 hours. LBV 2 was observed using the SCWARF along the river banks and the upper floodplain area up to adjacent parking lot.

On **May 8, 2012**, one male LBV (LBV 1) was detected vocalizing approximately 800 feet north of Bridge 3.4 in the SAR along the northeast bank within the SWS. He was observed for a short period of time before he flew off and ceased calling. This is likely the same male that was observed on April 16 and 27, 2012.

On **May 21, 2012** no LBV were observed during the survey effort.

On **June 1, 2012**, four LBV were detected during surveying activities. The first LBV (LBV 1) was observed approximately 500 feet to the northeast of the project site and is in the same location/territory as initially observed on April 16, 2012. The second LBV (LBV 3) was observed approximately 400 feet to the southeast of the Bridge 3.4 within the SCWARF (Figure 3). The third

and fourth LBV detected was a pair (LBV Pair) exhibiting nesting behavior and was observed approximately 150 feet south of the railroad in the lower portion of Mission Zanja Creek and within the limits of the survey area.

On **June 11, 2012**, three LBV were detected. A male LBV (LBV 2) was detected approximately 600 feet south of the project site. The male arrived from the south and was noted as countering singing with another LBV (LBV 3), then returned to the south out of the LBV survey area. The other two observed LBV were in the same locations as previously observed LBV, one to the north in the SCWRF (LBV 1) and one to the south in the willow riparian forest (LBV 3).

On **June 25, 2012**, three LBV were observed separately in previously detected locations. The pair that was first detected on June 1, 2012 (LBV pair) was spotted in the same location/territory. The other LBV (LBV 3) was detected to the south in the same willow riparian forest.

On **July 5, 2012**, three LBV were detected in previously observed and documented locations. The first LBV (LBV 3) was observed 400 to the south of Bridge 3.4 and the second and third LBV observed was the breeding pair (LBV Pair) that was first observed on June 1, 2012.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Breeding and non-breeding LBV were documented within the portion of the survey area located in the SAR. Implementation of the proposed project would temporarily and permanently impact nesting and foraging habitat (SWS and SCWARF) for LBV. HDR recommends the following measures to minimize and/or avoid impacts to nesting and foraging LBV:

(1) Construction activities within or immediately adjacent to LBV habitat should occur outside of the breeding season for the species (February 15 – September 15).

(2) Should construction within the breeding season be unavoidable, a pre-construction nesting survey may be required.

(3) The federal Endangered Species Act (ESA) defines and lists *species* as "endangered" or "threatened" and provides regulatory protection for the listed species. The federal ESA provides a program for conservation and recovery of threatened and endangered species. It also ensures the conservation of designated critical habitat that the USFWS has determined is required for the survival and recovery of these listed species. Section 9 of the federal ESA prohibits the "Take" of species listed by USFWS as threatened or endangered. *Take* is defined as: "…to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." In recognition that *Take* cannot always be avoided, Section 10(a) of the federal ESA includes provisions for *Take* that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) permits (incidental take permits) may be issued if *Take* is incidental and does not jeopardize the survival and recovery of the species.

Should *Take* of LBV be unavoidable as a result of project implementation, Section 10 consultation with USFWS may be required.

(4) The results identified in the survey report are generally considered valid for one year. Should implementation of the proposed project occur beyond this period, additional protocol-level surveys may be required by the wildlife agencies.

(5) Please note that mitigation would be established during consultation with the wildlife agencies.

8.0 REFERENCES

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APPENDIX A
Observed Avian Species

Appendix A
Inventory of Avian Species Observed

Common Name	Scientific Name	Status
Ciconiiformes		
Ardeidae		
Green Heron	*Butorides virescens*	-
Galliformes		
Odontophoridae		
California Quail	*Callipepla californica*	-
Falconiformes		
Cathartidae		
Turkey Vulture	*Cathartes aura*	-
Accipitrinae		
Cooper's Hawk	*Accipiter cooperii*	-
Red-tailed Hawk	*Buteo jamaicensis*	-
Charadriiformes		
Charadriiae		
Killdeer	*Charadrius vociferus*	-
Columbiformes		
Columbidae		
Rock pigeon	*Columbia livia*	-
Eurasian collared dove	*Streptopelia decaocto*	-
Mourning Dove	*Zenaida macroura*	-
Apodiformes		
Trochilidae		
Allen's hummingbird	*Selasphorus sasin*	-
Anna's Hummingbird	*Calypte anna*	-
Black-chinned hummingbird	*Archilochus alexandri*	-
Piciformes		
Picidae		
Northern Flicker	*Colaptes auratus*	-
Nuttall's Woodpecker	*Picoides nuttallii*	-
Passeriformes		
Ptilogonatidae		
Phainopepla	*Phainopepla nitens*	-
Tyrannidae		
Pacific-slope Flycatcher	*Empidonax difficili*	-
Ash-throated Flycatcher	*Myiarchus cinerascens*	-
Black Phoebe	*Sayornis nigricans*	-
Say's phoebe	*Sayornis saya*	-
Western Kingbird	*Tyrannus verticalis*	-
Cassin's kingbird	*Tyrannus vociferans*	-

Common Name	Scientific Name	Status
Vireonidae		
Least Bell's Vireo	*Vireo bellii pusillus*	FE
Warbling Vireo	*Vireo gilvus*	-
Corvidae		
American crow	*Corvus brachyrhynchos*	-
Common Raven	*Corvus corax*	-
Hirundinidae		
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	-
Barn swallow	*Hirundo rustica*	-
Aegithalidae		
Bushtit	*Psaltriparus minimus*	-
Troglodytidae		
Bewick's Wren	*Thryomanes bewickii*	-
House Wren	*Troglodytes aedon*	-
Regulidae		
Ruby-crowned Kinglet	*Regulus calendula*	-
Timaliidae		
Wrentit	*Chamaea fasciata*	-
Mimidae		
Northern mockingbird	*Mimus polyglottos*	-
Sturnidae		
European Starling	*Sturnus vulgaris*	-
Parulidae		
Yellow Warbler	*Dendroica petechia*	SSC
Yellow-rumped Warbler	*Dendroica coronata*	-
Common Yellowthroat	*Geothlypis trichas*	-
Orange-crowned Warbler	*Oreothlypis celata*	-
Wilson's Warbler	*Wilsonia pusilla*	-
Emberizidae		
Song Sparrow	*Melospiza melodia*	-
California Towhee	*Melozone crissalis*	-
Spotted Towhee	*Pipilo maculatus*	-
Cardinalidae		
Black-headed Grosbeak	*Pheucticus melanocephalus*	-
Western tanager	*Piranga ludoviciana*	-
Icteridae		
Bullock's oriole	*Icterus bullockii*	-
Hooded Oriole	*Icterus cucullatus*	-
Fringillidae		
Carduelinae		
House Finch	*Carpodacus mexicanus*	-
Lesser goldfinch	*Spinus psaltria*	-

SSC = State Species of Concern, FE = Federally Endangered, FT = Federally Threatened

APPENDIX B
Site Photographs

APPENDIX B
Site Photographs

Photograph 1. View of SWS within the Mission Zanja Creek. View looking east.

Photograph 2. View looking north of the project site at the SWS along the eastern side of the Santa Ana River.

Photograph 3. The SCWRF in the Mission Zanja Creek from the ROW. View looking to the east.

Photograph 4. The SCWRF in the Mission Zanja Creek from the ROW. View looking to the southwest towards the Santa Ana River.

APPENDIX H

Southwest Willow Flycatcher Report

GLENN LUKOS ASSOCIATES
Regulatory Services

August 13, 2012

Susie Tharratt
U.S. Fish and Wildlife Service
6010 Hidden Valley Road
Carlsbad, California 92011

SUBJECT: Submittal of Report for the Southwestern Willow Flycatcher at the Redlands Passenger Rail Project Located in the City of Redlands; San Bernardino County, California

Dear Ms. Tharratt:

This letter report summarizes the methodology and findings of surveys conducted for the federally-listed endangered southwestern willow flycatcher (*Empidonax traillii extimus*) ("SWIFL") conducted by Glenn Lukos Associates, Inc. (GLA) for the above-mentioned site in San Bernardino County, California. GLA was retained by HDR Engineering, Inc.to determine the presence or absence of the southwestern willow flycatcher at the property (hereinafter referred to as the "Project Site").

INTRODUCTION

The SWIFL is a small, migratory songbird, which inhabits riparian habitats throughout southern California and is one of four subspecies of willow flycatcher (WIFL) currently recognized. It was officially designated as a state-endangered species on January 2, 1991 and federally designated as endangered on March 29, 1995. The SWIFL measures about 5.75 inches (15 cm) in length, and weighs only about 0.4 ounces (12 g). Overall, it is roughly the size of a small sparrow. Both sexes look alike. Its appearance is overall greenish or brownish gray above, with a white throat that contrasts with a pale olive breast. The belly is pale yellow. Two white wing bars are visible, but the eye ring is faint or absent. The upper mandible is dark, and the lower mandible light (USGS). It closely resembles the other races of willow flycatcher, and several other species of the *Empidonax* genus, particularly the closely related Alder flycatcher (*Empidonax alnorum*). The SWIFL is generally the palest in coloration of the WIFL subspecies (Unitt 1987), but this difference in color is extremely subtle and is not recommended as a reliable way to distinguish between the subspecies in the field (Hubbard 1999).

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Telephone: (949) 837-0404 Facsimile: (949) 837-5834

The SWIFL breeds in relatively dense riparian habitats in all or parts of seven southwestern states, from near sea level to over 2,000 m (6,100 ft). More specifically, the SWIFL breeds in riparian habitats along rivers, streams, or other wetlands, where relatively dense growths of trees and shrubs are established, near or adjacent to surface water or underlain by saturated soil (McCabe 1991). Common tree and shrub species comprising nesting habitat include willow (*Salix* sp.), boxelder (*Acer negundo*), tamarisk (*Tamarix ramosissima*), and Russian olive (*Eleagnus angustifolia*) (USFWS 2002).

Habitat characteristics such as plant species composition, size and shape of habitat patch, canopy structure, vegetation height, and vegetation density vary across the subspecies range. However, regardless of the plant species composition or height, occupied sites usually consist of dense vegetation in the patch interior, or an aggregate of dense patches interspersed with openings. In most cases this dense vegetation occurs within the first 3-4 m (10-13 ft) above ground. These dense patches are often interspersed with small openings, open water or marsh, or shorter/sparser vegetation creating a mosaic that is not uniformly dense (USFWS 2002). The SWIFL winters in Mexico and Central America and northern South America (Phillips 1948, Gorsiki 1969, McCabe 1991, Koronkiewicz et al. 1998, Unitt 1999).

SITE LOCATION AND DESCRIPTION

The Project Site is located in the City of Redlands, San Bernardino County, California and can be found on the U.S. Geological Survey 7.5' San Bernardino South quadrangle [dated 1967 and photorevised in 1980]) in unsectioned areas of Township 1 South, Range 4 West [Exhibits 1 and 2 – Regional and Vicinity Map]. The WIFL surveys were conducted within a portion of the Project Site located north of South Waterman Avenue and south of East Orange Show Road.

The survey area included the Santa Ana River, approximately 91 meters (300 feet) on both sides of the railroad bridge crossing and also included Zanja Channel, which parallels the railroad corridor from the confluence of the Santa Ana River east approximately 0.65 kilometers (0.4 miles) to where the riparian vegetation terminates at a concrete spillway [Exhibit 3 – Survey Area Map]. The Santa Ana River within the survey area is approximately 170 meters wide (558 feet) and consists primarily of fine sandy substrate and includes areas supporting vegetated sandy terraces and islands. Zanja Channel is an un-improved trapezoidal earthen channel that is approximately 36 meters (118 feet) in width. Elevation of the Project Site is approximately 314 meters (1030 feet) above mean sea level. A detailed description of the riparian habitat surveyed is provided below.

VEGETATION

The riparian habitat surveyed within the Santa Ana River and Zanja Channel is comprised primarily of southern cottonwood willow riparian forest and southern willow scrub. In general, the riparian habitat is mature and consists of a sandy substrate. Portions of the Santa Ana River are unvegetated or support newer growth caused by seasonal scouring. Surface water or saturated soils were not detected within the Santa Ana River. The western half of Zanja channel supported dense riparian willow vegetation within a narrow sandy streambed. The eastern half of the channel was more open, supporting more cottonwoods than willows. A small central portion of Zanja channel exhibited surface water. The height of the riparian vegetation within the survey area ranged between 4.6 meters (15 feet) to 16.7 meters (55 feet), but averaged between 10.7 meters (30 feet) to 12.2 meters (40 feet).

Dominant riparian vegetation within the survey area includes arroyo willow (*Salix lasiolepis*), Freemont's cottonwood (*Populus fremontii* ssp. *fremontii*), red willow (*Salix laevigta*), Gooding's willow (*Salix goodingii*), sandbar willow (*Salix exigua*), yellow willow (*Salix lasiandra* ssp. *lasiandra*), and mule fat (*Baccharis salicifolia*).

Additional plants detected on site include western ragweed (*Ambrosia psilostachya*), mugwart (*Artemisia douglasiana*), common sunflower (*Helianthus annuus*), telegraph weed (*Heterotheca grandiflora*), prickly lettuce (*Lactuca serriola*), cocklebur (*Xanthium strumarium*), salt cedar (*Tamarix ramosissima*), wild grape (*Vitis girdiana*), California rose (*Rosa californica*), wild radish (*Raphanus sativus)*, annual yellow sweetclover (*Melilotus indicus*), white sweetclover (*Melilotus albus*), common sow-thistle (*Sonchus oleraceus*), Lamb's quarters (*Chenopodium album*), alkali heliotrope (*Heliotropium curassavicum*), Canadian horseweed (*Conyza canadensis*), black mustard (*Brassica nigra*), California buckwheat (*Eriogonum fasciculatum*), dwarf nettle (*Urtica urens*), cheeseweed (*Malva parviflorus*), Russian thistle (*Salsola tragus*), tocolote (*Centaurea melitensis*), blue gum (*Eucalyptus globulus*), shortpod mustard (*Hirschfeldia geniculata*), London rocket (*Sisymbrium irio*), chia (*Salvia coumbariae*), yerba santa (*Eriodictyon californicum*) and horehound (*Marrubium vulgare*).

METHODOLOGY

Protocol surveys for the SWIFL were performed in all areas of suitable habitat on site. Surveys were conducted in accordance with the 2010 U.S. Fish and Wildlife Service (USFWS) guidelines[1], which stipulate that for Projects, five surveys (divided into three survey periods)

[1] *A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher*, prepared by the USGS.

shall be conducted in all areas of suitable habitat. One survey was conducted during the first survey period (May 15 to May 31). Two surveys were conducted during the second survey period (June 1 to June 24), and two surveys were conducted during the third survey period (June 25 to July 17).

GLA biologist Jeff Ahrens (TE052159-3) conducted the protocol surveys on May 21, June 1, June 11, June 25, and July 5, 2012. All surveys were conducted during the morning hours and were completed before 10:30 A.M. No surveys were conducted during extreme weather conditions (i.e., winds exceeding 15 miles per hour, rain, or temperatures in excess of 95°F). All areas of suitable habitat were surveyed on foot by walking slowly and methodically. Taped vocalizations primarily using the willow flycatcher's main contact call "fitz-bew" was used to elicit responses from WIFLs that might be present on site. The detection of WIFLs on site was based on both sight and call.

Weather conditions during the surveys were conducive to a high level of bird activity. Temperatures ranged from approximately 53 ° to 82° Fahrenheit. Wind speeds ranged from one to three miles per hour (mph) during the surveys. Table 1 summarizes the survey dates and weather conditions recorded at the Project site.

Table 1. Summary of Survey Dates and Weather Conditions for the Redlands Passenger Rail Project

Date	Start Time	End Time	Permitted Surveyor	Temp °F, (start/end)	Wind Speed (MPH) (start/end)	% Cloud Cover (start/end)
5/21/12	0615	0950	JA	65 - 82	1 - 1	Clear
6/01/12	0600	0925	JA	63 - 73	1 - 1	Clear
6/11/12	0620	0945	JA	63 - 70	2 - 1	Clear
6/25/12	0530	0855	JA	53 - 62	1 - 3	Clear
7/5/12	0555	0900	JA	59 - 70	2 - 2	20 - 20

JA – Jeff Ahrens

RESULTS

No WIFLs were detected within the Project Site during the focused surveys. One least Bell's vireo (*Vireo bellii pusillus*) (LBV) pair exhibiting nesting behavior was detected within Zanja Channel near the confluence with the Santa Ana River. In addition, three unmated LBVs were detected outside of the survey area. LBV 1 was an unmated male that was detected on June 1, 11, 25, and July 5, 2012) approximately 132 meters (433 feet) south of the railroad crossing. LBV 2 was presumed to be an unmated male that was detected on June 1 and June 11, 2012

approximately 162 meters (531 feet) north of the railroad crossing. LBV 3 was a male that was observed briefly counter singing with LBV 1 on June 11, 2012 and proceeded to fly south and was not detected again. LBV 3 was approximately 170 meters (559 feet) south of the railroad crossing.

One individual Santa Ana River wooly star (*Eriastrum densifolium sanctorum*) was detected on June 11, 2012 within the Santa Ana River, immediately south of the railroad crossing. Other sensitive species detected within or close proximity to the Project Site include the yellow warbler (*Setophaga petechia*). Brown-headed cowbirds (*Molothrus ater*) were not detected during the focused surveys.

Exhibits 3 and 4 depict the survey area, LBV (and dates detected) and Santa Ana River wooly star locations on aerial and topographic maps, respectively. Data sheets are included at the end of the report. A compendium listing all avian species detected during the focused surveys is included at the end of the report.

If you have any questions regarding the methodology or findings of this report, please contact me at (949) 837-0404, ext 40.

I certify that the information in this survey report and attached exhibits fully and accurately represents my work.

GLENN LUKOS ASSOCIATES, INC.

Jeff Ahrens — TE 052159-3 — 8/13/12

Jeff Ahrens, Biologist — Permit # — Date

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APPENDIX A

AVIAN COMPENDIUM

The avian compendium lists bird species identified on the Site.

* = non-native species

ODONTOPHORIDAE	**Quails and Bobwhites**
Callipepla californica	California Quail
ARDEIDADE	**Herons and Egrets**
Butorides virescens	green heron
CATHARTIDAE	**New World Vultures**
Cathartes aura	turkey vulture
ACCIPITERIDAE	**Hawks, Old World Vultures and Harriers**
Accipiter cooperii	Cooper's hawk
Buteo jamaicensis	red-tailed hawk
CHARADRIIDAE	**Plovers And Relatives**
Charadrius vociferus	killdeer
COLUMBIDAE	**Pigeons and Doves**
* *Columbia livia*	rock pigeon
* *Streptopelia decaocto*	Eurasian collared dove
Zenaida macroura	mourning dove
TROCHILIDAE	**Hummingbirds**
Archilochus alexandri	black-chinned hummingbird
Calypte anna	Anna's hummingbird
Selasphorus sasin	Allen's hummingbird
PICIDAE	**Woodpeckers and Wrynecks**
Colaptes auratus	northern flicker
Picoides nuttallii	Nuttall's woodpecker
TYRANNIDAE	**Tyrant Flycatchers**
Empidonax difficilis	Pacific-slope flycatcher
Myiarchus cinerascens	ash-throated flycatcher
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Tyrannus vociferans	Cassin's kingbird

VIREONIDAE		**Vireos**
	Vireo bellii puusillus	least Bell's vireo
CORVIDAE		**Jays, Magpies and Crows**
	Corvus brachyrhynchos	American crow
	Corvus corax	common raven
HIRUNDINIDAE		**Swallows**
	Stelgidopteryx serripennis	northern rough-winged swallow
	Hirundo rustica	barn swallow
AEGITHALIDAE		**Bushtit**
	Psaltriparus minimus	bushtit
TROGLODYTIDAE		**Wrens**
	Thryomanes bewickii	Bewick's wren
	Troglodytes aedon	house wren
MIMIDAE		**Mockingbirds and Thrashers**
	Mimus polyglottos	northern mockingbird
PTILOGONATIDAE		**Silky-flycatchers**
	Phainopepla nitens	phainopepla
STURNIDAE		**Starlings and Allies**
*	*Sturnus vulgaris*	European starling
PARULIDAE		**Wood Warblers and Relatives**
	Geothlypis trichas	common yellowthroat
	Oreothlypis celata	orange-crowned warbler
	Setophaga petechia	yellow warbler
EMBERIZIDA		**Emberizines**
	Melospiza melodia	song sparrow
	Melozone crissalis	California towhee
	Pipilo maculates	spotted towhee
CARDINALIDAE		**Cardinals, Grosbeaks, and Allies**
	Pheucticus melanocephalus	black-headed grosbeak
	Piranga ludoviciana	western tanager
ICTERIDAE		**Blackbirds, Orioles, and Allies**
	Icterus bullockii	Bullock's oriole

Icterus cucullatus	hooded oriole
FRINGILLIDAE	**Finches**
Spinus psaltria	lesser goldfinch
Carpodacus mexicanus	house finch

Willow Flycatcher (WIFL) Survey and Detection Form (revised April, 2010)

Site Name: Redlands Passenger Rail Project State: CA County: San Bernardino

USGS Quad Name: San Bernardino South Elevation: ~308 (meters)

Creek, River, or Lake Name: Santa Ana River & Zanja Channel

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? *Yes* X *No* ____

Survey Coordinates: Start: E 474843.36 N 3770435.32 UTM Datum: 83 (See instructions)

Stop: E 475531.89 N 3770325.68 UTM Zone: 11

If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.

Fill in additional site information on back of this page*

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding;-potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
							# Birds	Sex	UTM E	UTM N
Survey # 1 Observer(s): Jeff Ahrens	Date: 5/21/12 Start: 0615 Stop: 0950 Total hrs: 3hr, 35m	–	–	–	–	No WIFL Detected				
Survey # 2 Observer(s): Jeff Ahrens Jason Fitzgibbon	Date: 6/1/12 Start: 0600 Stop: 0925 Total hrs: 3hr, 25m	–	–	–	–	" "				
Survey # 3 Observer(s): Jeff Ahrens	Date: 6/11/12 Start: 0620 Stop: 0945 Total hrs: 3hr, 25m	–	–	–	–	" "				
Survey # 4 Observer(s): Jeff Ahrens	Date: 6/25/12 Start: 0530 Stop: 0855 Total hrs: 3hr, 25m	–	–	–	–	" "				
Survey # 5 Observer(s): Jeff Ahrens	Date: 7/5/12 Start: 0555 Stop: 0900 Total hrs: 3hr, 5m	–	–	–	–	" "				

Overall Site Summary	Total Adult Residents	Total Pairs	Total Territories	Total Nests
Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals. Total survey hrs: 16hr, 55m	0	0	0	0

Were any WIFLs color-banded? Yes ____ No ____

If yes, report color combination(s) in the comments section on back of form and report to USFWS.

Reporting Individual: Jeff Ahrens Date Report Completed: 8/13/12

US Fish & Wildlife Service Permit #: TE 052159-3 State Wildlife Agency Permit #: SCP 5820/Mau

Submit form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual Jeff Ahrens Phone #(949) 837-0404 ext 40

Affiliation Glenn Lukos Associates E-mail wildlife-biologist@yahoo.com

Site Name Redlands Passenger Rail Project Date report Completed 8/13/12

Was this site surveyed in a previous year? Yes___ No X Unknown___

Did you verify that this site name is consistent with that used in previous yrs? Yes X No _____ Not Applicable _____

If name is different, what name(s) was used in the past? —

If site was surveyed last year, did you survey the same general area this year? Yes N/A No _____ If no, summarize below.

Did you survey the same general area during each visit to this site this year? Yes X No _____ If no, summarize below.

Management Authority for Survey Area: Federal _____ Municipal/County X State _____ Tribal _____ Private _____

Name of Management Entity or Owner (e.g., Tonto National Forest) San Bernardino County Flood Control District / SANBAG

Length of area surveyed: ~ 0.85 (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

X Native broadleaf plants (entirely or almost entirely, > 90% native)

_____ Mixed native and exotic plants (mostly native, 50 - 90% native)

_____ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)

_____ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific name.

Salix lasiolepis, Salix laevigata, Populus fremontii, Baccharis Salicifolia, Salix exigua

Average height of canopy (Do not include a range): 30 feet (9.1) meters (meters)

Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections;
2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests;
3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features. Attach additional sheets if necessary.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

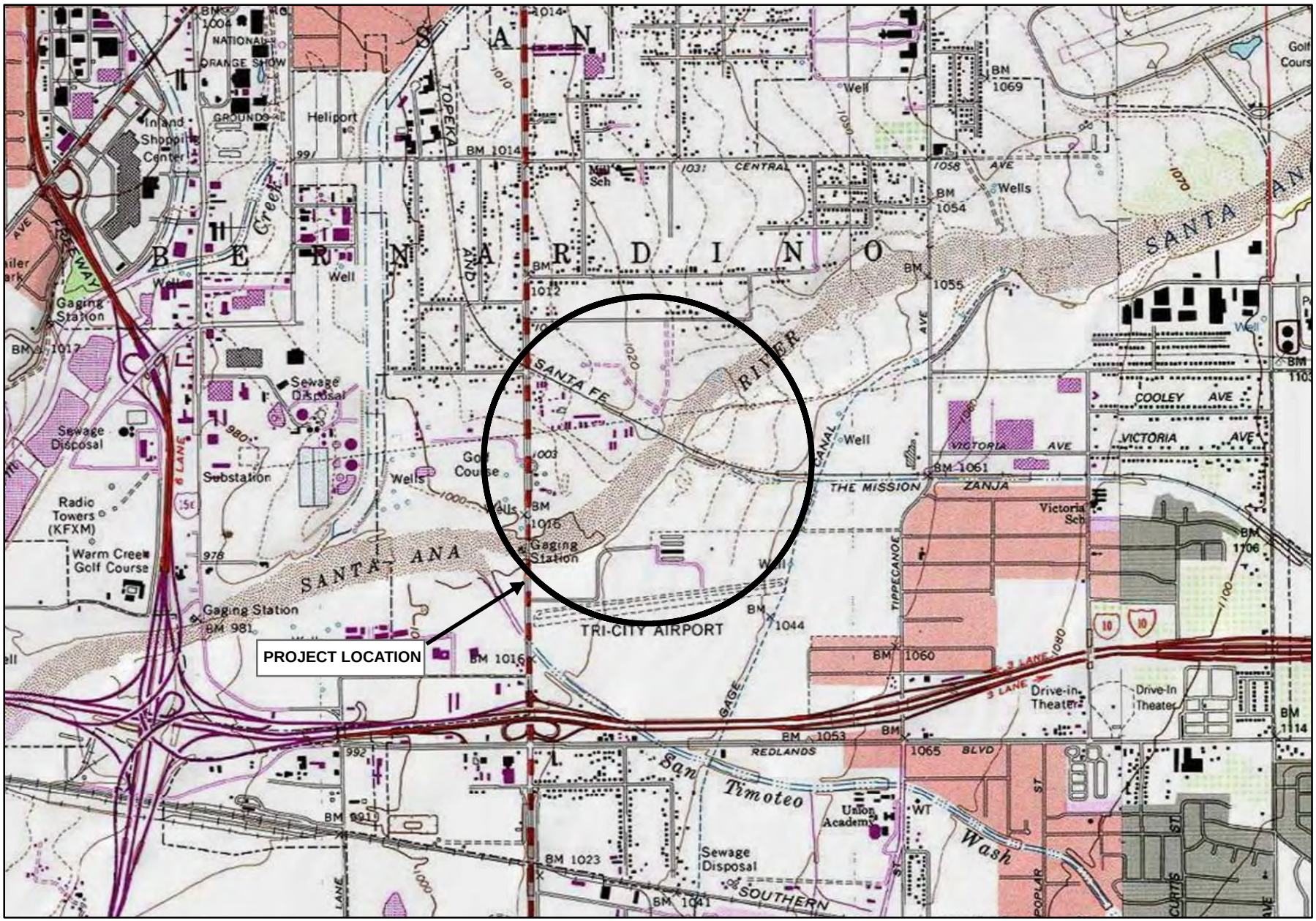
Source: ESRI World Street Map

REDLANDS PASSENGER RAIL PROJECT

Regional Map

GLENN LUKOS ASSOCIATES

Exhibit 1



Adapted from USGS San Bernardino South, CA quadrangle

N

0 1,000 2,000 4,000 Feet

REDLANDS PASSENGER RAIL PROJECT

Vicinity Map

GLENN LUKOS ASSOCIATES

Exhibit 2

Legend

- Limits of Survey Area
- Unmated LBV 1 (June 1, 11, 25 & July 5)
- Unmated LBV 2 (June 1 & 11)
- Unmated LBV 3 (June 11)
- LBV Pair (June 1, 25 & July 5)
- Santa Ana River Wooly Star

N

0 100 200 400
Feet

REDLANDS PASSENGER RAIL PROJECT

Southwestern Willow Flycatcher Survey Area Aerial Map

GLENN LUKOS ASSOCIATES

Exhibit 3

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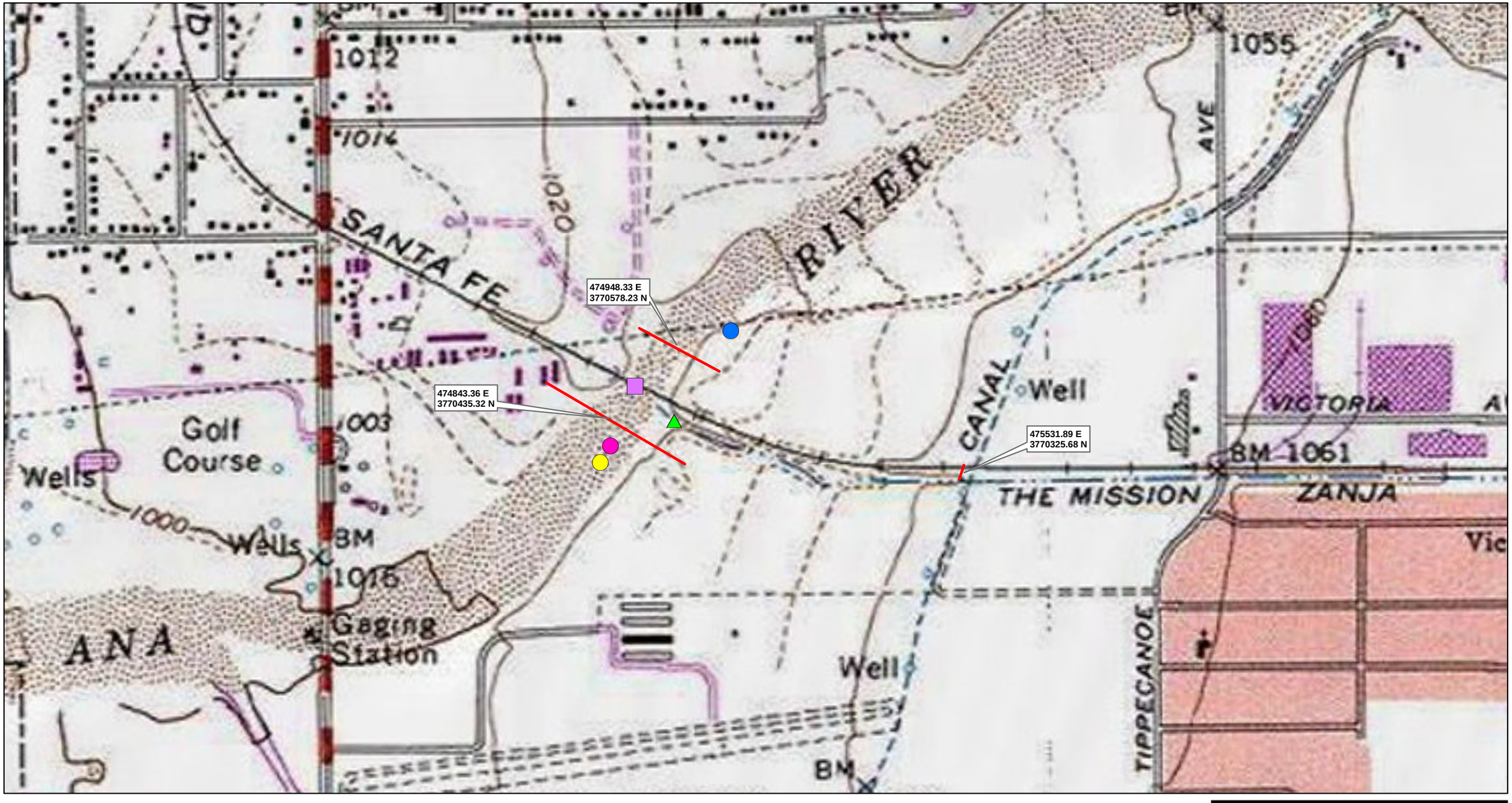
July 20,2012



Legend

- Limits of Survey Area
- Unmated LBV 1 (June 1, 11, 25 & July 5)
- Unmated LBV 2 (June 1 & 11)
- Unmated LBV 3 (June 11)
- LBV Pair (June 1, 25 & July 5)
- Santa Ana River Wooly Star

N

0 300 600 1,200
Feet

REDLANDS PASSENGER RAIL PROJECT

Southwestern Willow Flycatcher Survey Area USGS Map

GLENN LUKOS ASSOCIATES

Exhibit 4

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July 20,2012

Photograph 1: View looking south at the southern bank of the Santa Ana River at the confluence with Zanja Channel, from beneath the railroad bridge crossing.

Photograph 2: View looking southwest at the Santa Ana River, north (upstream) of the railroad bridge crossing.

Photograph 3: View looking east within Zanja Channel, near the confluence with the Santa Ana River.

Photograph 4: View looking east within Zanja Channel, approximately 300 meters east of the confluence with the Santa Ana River.

GLENN LUKOS ASSOCIATES

Exhibit 5

REDLANDS PASSENGER RAIL PROJECT

Site Photographs

APPENDIX I

Burrowing Owl Report

Redlands Passenger Rail Project

Western Burrowing Owl Survey Report

October 2012

Prepared for

San Bernardino Associated Governments
1170 W. Third Street, 2nd Floor
San Bernardino, California 92410

Prepared by

HDR Engineering, Inc.
8690 Balboa Avenue, Suite 200
San Diego, California 92123

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1.0 INTRODUCTION

This report details the results of a focused western burrowing owl (*Athene cunicularia hypugaea*; BUOW) habitat assessment and breeding season owl survey for the Redlands Passenger Rail Project (Project or RPRP), located within the County of San Bernardino, California (Figure 1). The Project would include the development of new railroad infrastructure along an approximate nine-mile section of rail corridor owned by the San Bernardino Associated Governments (SANBAG). The Project would include the development of five stations consisting of boarding platforms with supporting amenities, parking and pedestrian access improvements, train layover/storage facilities with storage tracks, a vehicle wash, ancillary facilities, grading and drainage improvements, railroad signal improvements, replacement or improvements to five existing bridge structures, and approximately two dozen at-grade highway-rail crossings. In summary, no BUOW were observed within the survey area during focused 2012 BUOW surveys.

2.0 PROJECT AND SITE DESCRIPTION

The Project occurs along a nine-mile corridor between the cities of San Bernardino and Redlands, located within the County of San Bernardino, California (Figure 1). The survey area (which includes the entire Project alignment) occurs within the San Bernardino South and Redlands U.S. Geologic Survey 7.5-minute quadrangles (Figures 2a and 2b). The RPRP would involve the implementation rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. The five station stops proposed in conjunction with the RPRP would be located at E Street and Tippecanoe Avenue within the City of San Bernardino and New York Street, Orange Street, and University Street within the City of Redlands. Maintenance activities would be performed at a new layover facility proposed west of California Street and south of Interstate 10 (I-10) in the City of Redlands, just north of the Loma Linda city limits. The overall RPRP and major components are generally illustrated in Figure 3.

Construction of the Project would occur within an existing railroad right-of-way (ROW) owned by SANBAG. SANBAG's ROW averages 50 to 100 feet in width, with the exception of portions of downtown Redlands where the ROW measures less than 40 feet. Additional details regarding each of the components comprising the Project and associated operations are described under the following subheadings.

Track Improvements

The Project would include the construction of track improvements to facilitate train movements along a single track through the rail corridor with an approximately 10,000-foot-long section of passing track or siding, from just west of Richardson Street to just east of California Street (MP 5.5 to MP 7.4). The proposed track ballast and sub-grade along the nine-mile Project corridor would be constructed to 50 feet in width, sufficient to support a parallel maintenance road. In downtown Redlands, this width would be reduced to less than 40 feet in recognition of the constrained ROW. This would require demolition and replacement of the existing track. These improvements would adhere to standards established by Burlington Northern Santa Fe (BNSF) and Southern California Regional Railroad Authority (SCRRA) for the rail, rail ties, ballast and subballast materials, grade crossing panels, placement of drainage structures and retaining walls, and horizontal and vertical clearances. The rail improvements would also include the construction of a new train signaling and communications system.

Structural Crossings and Bridges

The Project would require the replacement or retrofitting of up to six structural crossings to facilitate the loading requirements of the Metrolink trains and track foundation. Five of the six structural crossings consist of existing bridge structures. The location of each of these proposed structural replacements is illustrated in Figure 3.

Roadway Grade Crossings

The Study Area traverses 32 existing roadway grade crossings including two I-10 underpasses. Roadway grade crossing not subject to closure would be redesigned in accordance with the latest Grade Crossing Design Guidelines that in certain cases require raised medians, widened sidewalks, traffic striping, flashing lights, pedestrian gate arms where requested by the CPUC, and swing gates.

Proposed Rail Platforms

There are currently five station stops proposed for the Project with new rail platforms proposed at four locations. Two station stops (E Street and Tippecanoe Avenue) would be located in the City of San Bernardino, while the other three (New York Street, Downtown Redlands, and the University of Redlands) would be located in the City of Redlands. The E Street Rail Platform would be constructed in conjunction with the already approved Downtown San Bernardino Passenger Rail Project (DSBPRP) and, therefore, only track improvements would be required west of E Street to align the Project tracks with the planned rail platforms.

Rail platforms would, in most instances, be less than 200 feet long[1] and would be designed to provide access consistent with American Disability Act (ADA) requirements[2]. Pedestrian crossovers[3] would be provided for each platform with accessible parking provided adjacent to pedestrian crossovers. Ticket vending machines would be located adjacent to crossovers. Shade structures (or canopies) would be provided to individually distinguish each rail platform and to compliment the contextual surroundings. Landscape planters would be used to separate platforms from open areas, adjacent uses, and walkways.

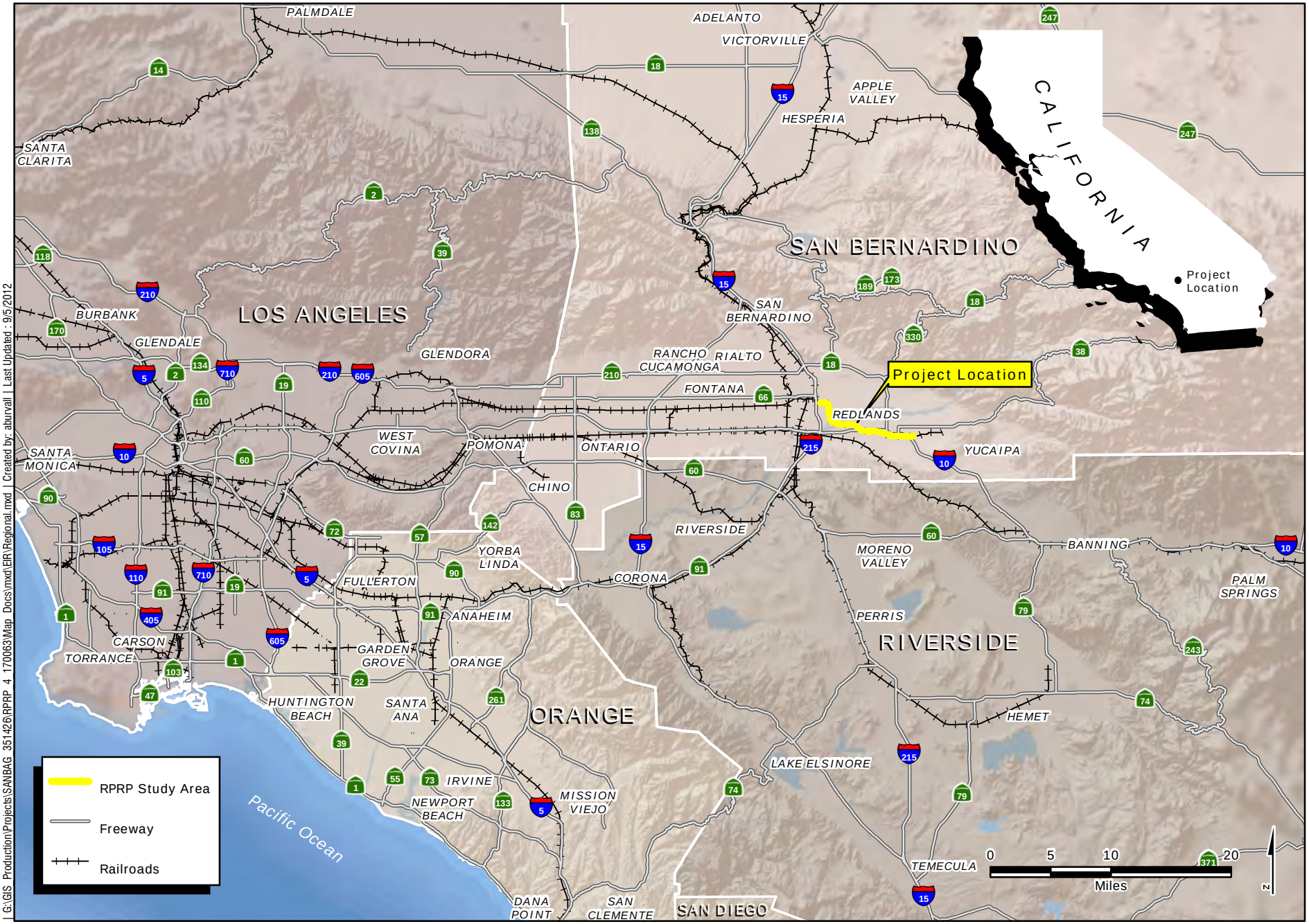
Train Layover Facility

The Project would require the development of a new Train Layover Facility to include sufficient storage tracks for maintenance activities and operational activities including offices, training rooms, and a crew break room. The Train Layover Facility would be constructed on a long narrow site immediately south of I-10 and west of California Street (see Figure 3) and would contain up to seven spur tracks.

[1] A minimum of 170 feet is required to accommodate two 85-foot Bombardier passenger coaches.

[2] Access to commuter rail trains for riders with mobility limitations would be provided through the use of a mini-high platform at each station consistent with ADA requirements.

[3] Pedestrian crossovers may consist of at-grade, below grade (e.g., underpass), or above grade crossings (e.g., overpass) pending final design.



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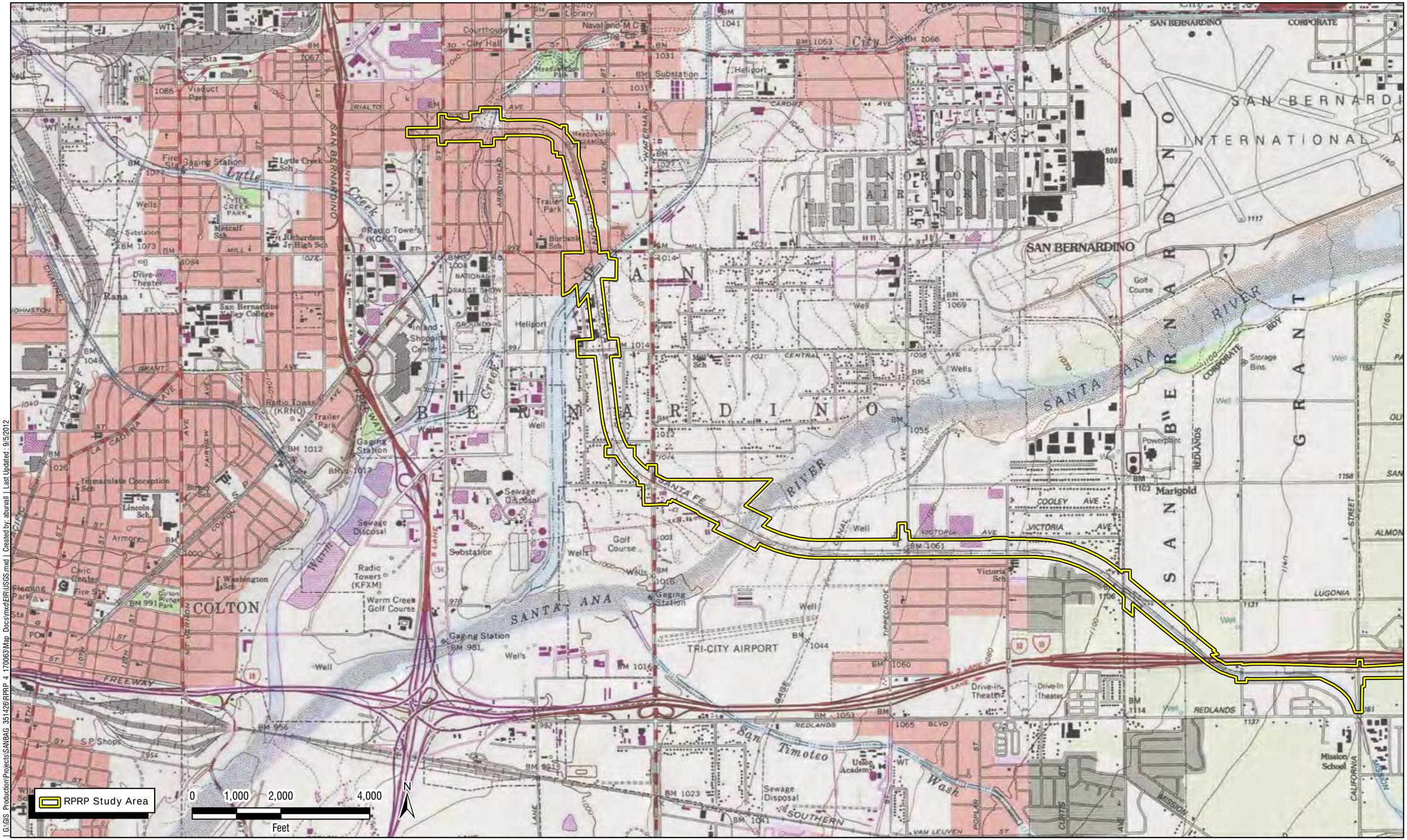
Regional Location Map

Figure 1

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



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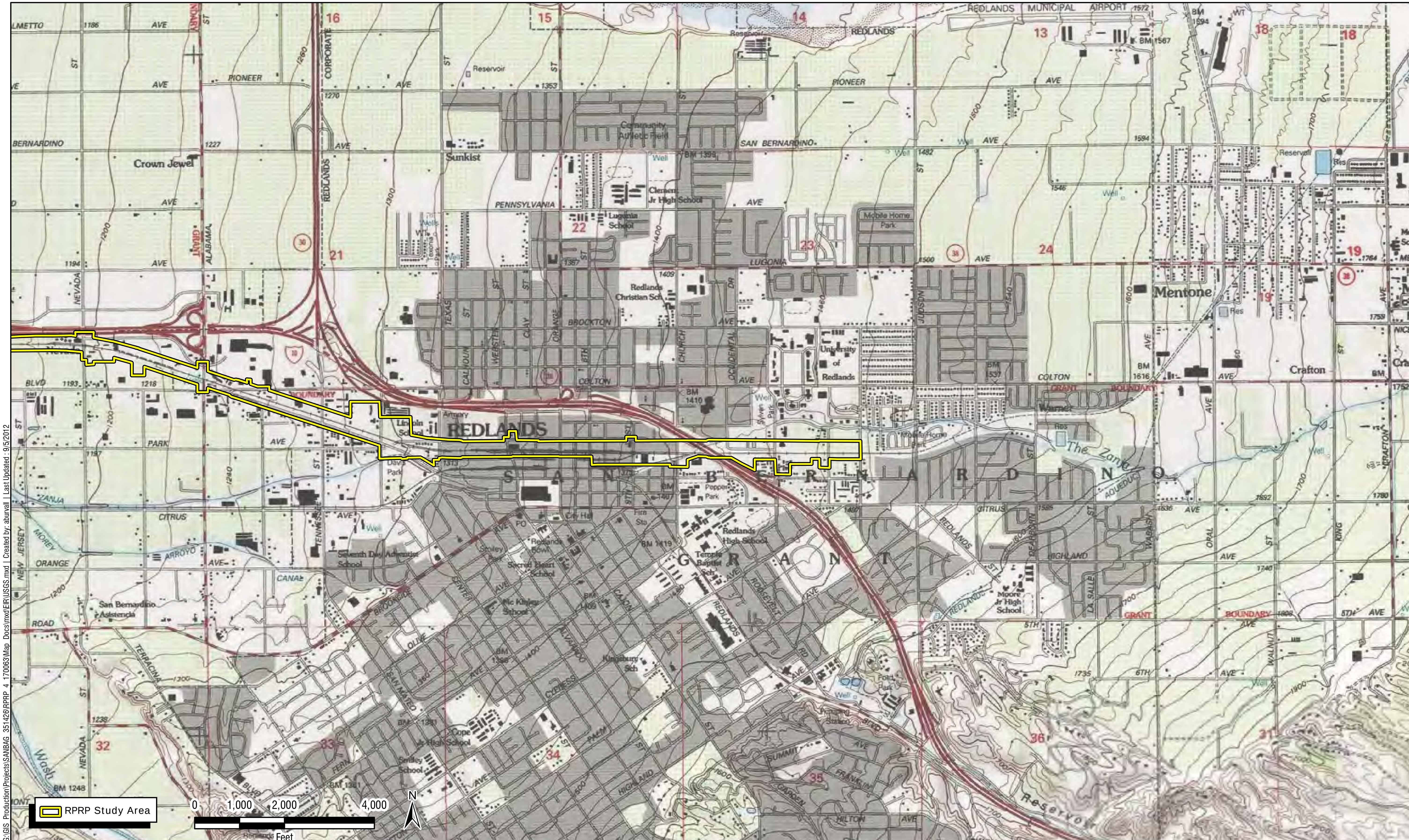
USGS Topographic Map

Figure 2a

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



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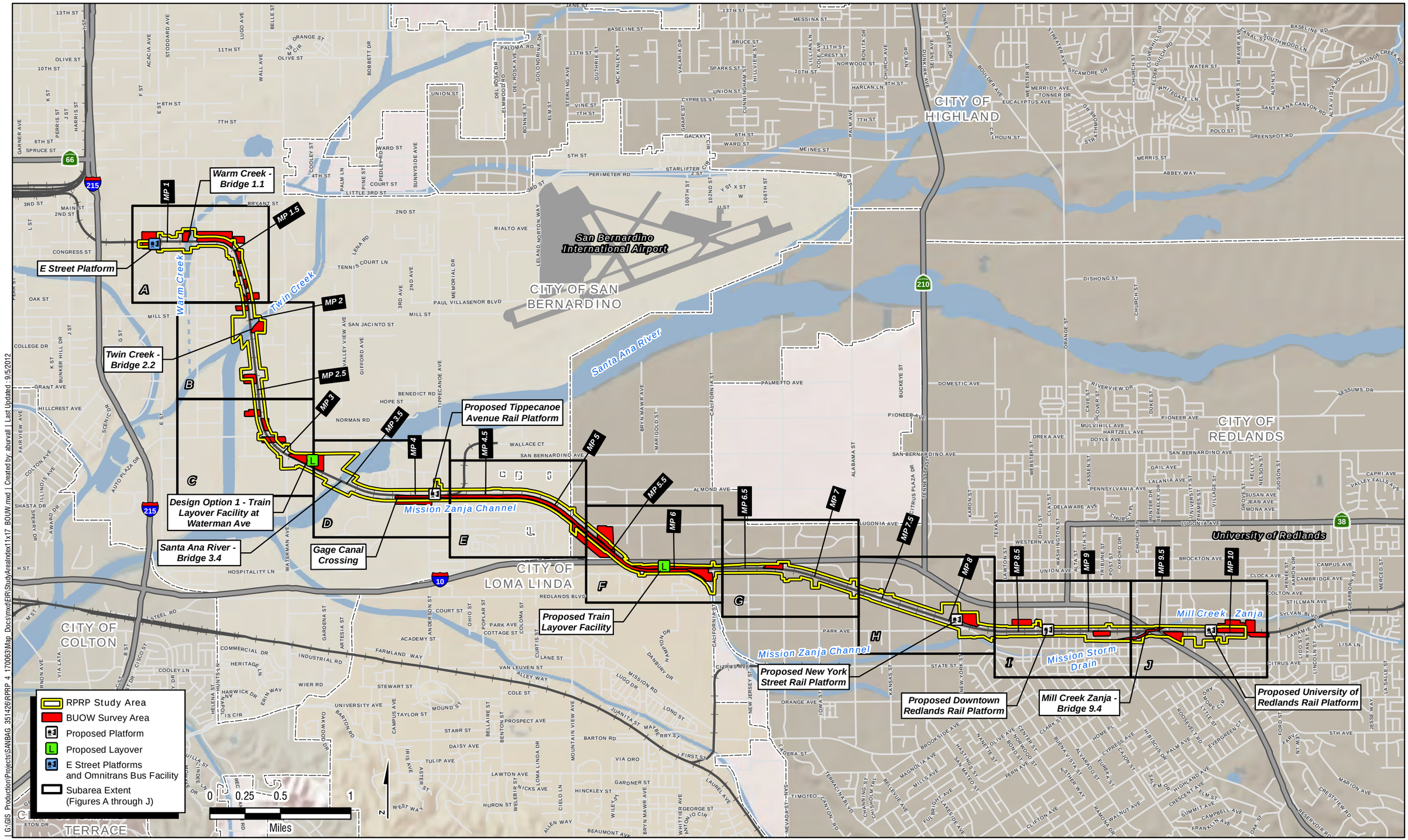
USGS Topographic Map

Figure 2b

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



Burrowing Owl Survey Results Overview

Figure 3

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

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Utility Replacement and Relocation

The Project would likely necessitate the relocation of existing subsurface and overhead crossing utilities (i.e., water, sewer, storm drain, power, gas, fiber optic, and telephone lines) in accordance with applicable utility accommodation design criteria and engineering standards.

Specific utilities known to cross the Study Area are identified below. The exact method of improvement, if required, would be determined in coordination with the affected utility provider in conjunction with the Project's final design.

Drainage

Several drainage facility improvements would be necessary to accommodate the track improvements, bridge replacements, platform improvements, and layover facility. It is anticipated that a majority of the storm drain facilities would be protected in place and would not need to be lowered to meet minimum depth requirements. However, it is likely that the majority of the storm drain casings within the rail ROW would need to be extended to span the entire width of the rail ROW. These improvements would be coordinated with the cities of San Bernardino and Redlands along with the San Bernardino County Flood Control District (SBCFCD). In addition, longitudinal storm drain lines located within the rail corridor would need to be relocated further from the proposed track centerlines to comply with BNSF engineering standards.

Mission Zanja Creek Improvements. Mission Zanja Creek runs parallel to the rail line from the Santa Ana River (SAR) to approximately 900 feet west of California Street for a distance of approximately 2.6 miles, where it diverges from the study area to the south. At approximately milepost 9.4 (Bridge 9.4), the creek rejoins the railroad further east, as Mill Creek Zanja where it passes under the railroad just west of the I-10 overcrossing. Mission Zanja Creek is characterized as an improved, trapezoidal earthen channel with some segments including wire revetment (USACE, 1994). The capacity of the open channel ranges from 3,500 cubic feet per second (cfs); however, several the roadway bridges limit the flow carrying capacity to less than 1,500 cfs along portions that border the rail corridor (HDR 2012). To ensure the structural integrity of the track improvements along sections of Mission Zanja Creek, the Project would require bank stabilization improvements (e.g., armoring) to the northern bank of the Mission Zanja Creek, from MP 3.6 to MP 7.2, to ensure that the bank is able to support the additional loading requirements and withstand scour during high flow events. At this time, SANBAG is proposing the use of articulated concrete block (ACB) to support the armoring of the northern bank, which would allow for the growth of limited vegetation. This improvement would be coordinated and constructed with the SBCFCD, which owns and maintains the Mission Zanja Creek.

Description of Passenger Rail Operations

The Project would incorporate the use of previously owned rail commuter rail vehicles and would start operations in early 2018. Project rail service would operate between the E Street and University of Redlands rail platforms with stops at each of the station stops along the route. Trains would operate every 30 minutes in the peak periods and every hour in the off-peak period. This would translate to 25 average daily round trips along the alignment during weekdays.

The Project does not propose any corresponding increase in freight service. All freight movements are assumed to occur during the nighttime hours to allow for spatial separation of freight and passenger trains.

Maintenance

Maintenance of the rail ROW is currently the responsibility of BNSF, which is the current operator of the rail line. This includes routine maintenance of the track and track ties, grade crossings, and communication system. Vegetation management and weed abatement would also be required along the ROW. Each platform would also require routine landscaping and facility maintenance (e.g., replacement of lighting fixtures).

The maintenance of the SCRRA commuter rail system is governed by the Federal Railroad Administration (FRA) regulations and by the California Public Utilities Commission (CPUC) General Orders. SCRRA owns a fleet of locomotives and coaches that are maintained at the Central Maintenance Facility (CMF) in Los Angeles and at the Eastern Maintenance Facility (EMF) in Colton. Routine vehicle inspection and light repair are also performed at various layover sites throughout the SCRRA commuter rail system, including the Inland Empire Maintenance Facility (IEMF) located approximately one mile west of E Street in San Bernardino. Typical railroad maintenance and inspections would be conducted by a contractor hired by SANBAG throughout the operational phase of the Project in accordance with SCRRA/Metrolink and BNSF standard practices.

Construction

Construction of the proposed Project would begin in 2015 and take up to 36 months to complete. Construction would proceed generally from west of E Street to the SAR, and similarly from the SAR east to Cook Street. Construction scheduling and phasing would ultimately be at the discretion of SANBAG's contractor. In total, the anticipated construction disturbance area is estimated at 151.51 acres; however, actual physical disturbance would generally be limited to 5 acres or less on any given day. Of this total disturbance area, approximately 19.84 acres would be limited to temporary construction-related impacts associated with the bridge structures and staging areas, while approximately 131.67 acres would be permanently impacted by the placement of one or more Project facilities.

A description of anticipated construction activities over the course of Project construction is provided as follows:

- Construction easement acquisition, clearing and grubbing, and removal of existing track;
- Relocate, extend, or encase utilities, as appropriate, to remove conflicts;
- Construct embankments, culvert extensions, and retaining walls for the proposed rail corridor, as necessary;
- Re-grade, install drainage, and construct bridge crossings, including as appropriate, new standard height parapets on both sides of each bridge, construct in-fill walls, plug deck drains, construct new spread footings at each pile, and seal parapet joints;
- Construct new rail platforms at proposed rail platform locations and layover facility; and

- Construct new continuous welded rail track, roadway grade crossings, and install pedestrian access improvements and landscaping, where appropriate.

These activities would likely overlap at times. Staging areas for construction equipment and materials would be located primarily within the SANBAG ROW to the extent feasible. Other staging areas would be acquired, as necessary, by the construction contractor and, to the extent feasible, would include vacated roadway ROW. The location of the staging areas would depend on the rail segment, bridge, and platform locations being constructed. In addition, a part of the proposed layover facility would be used as a centralized construction staging area for heavy equipment due to its centralized location along the rail corridor.

Structural Improvements at Water Crossings

Construction of the structural crossings at local waterways, including the SAR, may require the isolation of the work zone through the installation of a cofferdam and/or construction work pads within the wet area. Construction could also cause debris to fall into the local waterways; however, a debris containment system will be installed under the bridge to catch any falling debris. Erosion, sedimentation, and hazardous materials spill or leakage from construction vehicles is also considered a potential impact to water quality. To address these issues, the Project will require the contractor to conduct vehicle refueling within the staging/assembly area, a minimum of 50 feet from wetland areas.

The Project will include preparation of a Storm Water Pollution Prevention Plan (SWPPP), as well as other Permit Registration Documents (PRDs) by the project engineer or contractor. The SWPPP will identify Best Management Practices (BMPs) to address potential short-term impacts and post-construction (long-term) measures to be implemented for the Project. Stormwater pollution prevention BMPs included as a part of the SWPPP would be implemented in accordance with the California Stormwater Construction Handbook (latest edition) and the Construction General Permit Order No. 2009-0009-DWQ. Construction could also involve limited dredging of material from the channel bed and/or excavation along the adjacent banks. These activities could also include the placement of fill including concrete and riprap. To minimize construction activity in the channel, the structural improvements would be constructed in two or more increments to the minimize disturbance to the channel bottom and allow for the safe passage of water flow. A similar approach would be employed for the removal of any existing structures. To minimize the mobilization of sediment, in-channel construction activities would be limited to the period between April 15 and October 15 to the extent feasible.

New structural supports would be constructed behind an encircling temporary cofferdam constructed of sheet piling or similar method, such as the use of kiss piles. The foundation would consist of a reinforced concrete supported by piling, with conventional reinforced concrete piers extending up to the bridge decks. To minimize the potential for falling debris into local waterways during bridge construction, a debris containment system would be installed under the bridge to catch any falling debris. If flow is present and as an additional precaution, a boom would be strung across the water feature to keep any material that escapes the containment system from being carried down stream.

Diversion of Water

If flow is present during construction, a temporary diversion of water may be required. The diversion may consist of a temporary bypass using a pipe, flume, excavated channel, or alternative method that temporarily reroutes water around the construction area. The method would ultimately be at the discretion of the construction contractor. Surface water diversion BMPs would be required to prevent or reduce mingling of construction-related runoff with upstream non-construction-related runoff so as to prevent the introduction of sediment, nutrients, pesticides, and/or other pollutants to local waterways during construction.

3.0 PURPOSE OF STUDY

The purpose of the focused BUOW study is threefold: (1) to determine if suitable burrowing owl habitat occurs within the Project area; (2) characterize suitable BUOW habitat; and (3) characterize any BUOW that are detected within suitable habitat. These data were used in the assessment of biological resource values with an analysis that allows for a determination of Project-related direct and indirect impacts, as required by California Environmental Quality Act (CEQA). By assessing impacts to biological resources it is also possible to propose mitigation and mitigation measures, if appropriate.

4.0 WESTERN BURROWING OWL STATUS AND BIOLOGY

Burrowing owl has a broad distribution that includes open country throughout the Midwest, western United States, Texas, southern Florida, parts of central Canada, Mexico, and the drier regions of Central and South America. In southern California, the species is known from lowlands over much of the region, particularly in agricultural areas. In California, the BUOW has been extirpated as a breeding species during the last 10-15 years from approximately 8 percent of its former range (Klute 2003). Primary threats across the North American range of the BUOW are habitat loss and fragmentation primarily due to intensive agricultural and urban development, and habitat degradation due to declines in populations of colonial burrowing mammals (Grant 1965, Konrad and Gilmer 1984, Ratcliff 1986, Haug et al. 1993, Dundas and Jensen 1994/95, Rodriguez- Estrella et al. 1998, Dechant et al. 1999).

BUOW is primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity (Shuford and Gardali 2008, references found therein). The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting, and relatively short vegetation with only sparse shrubs and taller vegetation (Green and Anthony 1989, Haug et al. 1993). Owls in agricultural environments nest along roadsides and water conveyance structures (open canals, ditches, drains) surrounded by crops (DeSante et al. 2004, Rosenberg and Haley 2004). BUOW often nest near and under runways and associated structures (Thomsen 1971, Gervais et al. 2003). Individual BUOWs have moderate to high site fidelity to general breeding areas, prairie dog colonies, and even to particular nest burrows (Klute 2003). Burrow fidelity has been reported in some areas; however, more frequently, BUOWs reuse traditional nesting areas without necessarily using the same burrow (Haug et al. 1993, Dechant et al. 1999). Occupancy of suitable habitat can be verified at a site by observing owls during the spring and summer months or, alternatively, the presence of molted feathers, cast pellets, prey remains, eggshell fragments, or excrement (white wash) at or near a burrow entrance.

Burrowing owls follow a crepuscular habit, being most active during the early morning and evening hours. Their diet is predominantly large insects and small rodents, but they will also take small birds, reptiles, amphibians, fish, scorpions, and other available prey. They are often observed perched on fence posts or utility wires or in close association with their burrow. They typically live eight years or more.

Migratory individuals arrive on the breeding areas either singly or paired. Non-migratory owls retain pair bonds throughout the year (Haug et al. 1993). The breeding season for BUOW generally begins in the month of April.

5.0 WESTERN BURROWING OWL SURVEY METHODOLOGY

A BUOW habitat assessment was conducted by HDR biologists Aaron Newton and Allegra Simmons on April 4 and 5, 2012. Per the guidelines presented in the Staff Report on Burrowing Owl Mitigation (2012), the habitat assessment included 100 percent cover of a 150-meter (500-foot) buffer around the proposed Project footprint. The biologists assessed all habitat within the BUOW survey area (footprint plus 500-foot buffer) for the presence of burrows, burrow surrogates, fossorial mammal dens, well drained soils, available prey, and short or sparse vegetation. Where access was prohibited (i.e., gated, private property, etc.), biologists used binoculars and aerial photography to determine suitability. During the initial site visit, locations of suitable habitat were identified and delineated as either having high or low potential based on the friability of the soil, whether the land was in agricultural production or had native soils, and the presence of burrows. Areas with suitable habitat were the focus of the protocol surveys (Figures 3a-3t). A survey route was established through the suitable habitat and was followed during each survey session.

Breeding season focused surveys were conducted for the Project by HDR Biologists Allegra Simmons (AS), Sean Harris (SH), Joe Schroeder (JS), Summer Adleberg (SA), and Aaron Newton (AN). Per guidelines presented in the 2012 Staff Report, four separate surveys were conducted within suitable habitat. The surveys were spaced no less than three weeks apart, with the first survey occurring between February 15 and April 15. Surveys were conducted during either morning civil twilight and 10 am or two hours before sunset until evening civil twilight. Given the large size of the Project, it took 2-4 visits to cover the entire site for each of the four surveys.

Focused surveys were conducted by either walking transects (primarily in the large vacant lot areas) or by walking along the center of the flood control channel or along the banks. In areas with good visibility along the straight flood control channel, biologists would drive along the channel and enter the channel every 50-100 meters to scan the banks. Survey dates, times, and weather conditions are summarized in Table 1.

Wildlife observations in addition to those of BUOWs were made opportunistically (Appendix B). Zoological nomenclature used in this report is taken from Stebbins (2003) for reptiles and amphibians, American Ornithologists Union (2005) for birds, and Burt/Grossenheider (1980) for mammals.

Table 1. Survey Dates, Times, and Environmental Conditions

Date	Surveyor	Start Time	End Time	Temp (°F)	Wind (mph)	Cloud Cover
04/10/12	AS/AN	0715	0900	68	0–1	0%
04/10/12	AS/AN	1730	1911	62	3-10	10%
05/07/12	AS/AN	1720	1930	86	0-3	0%
05/08/12	AS/AN/SA/JS	1730	1815	91	0-4	0%
06/04/12	AS/AN	1747	1930	76	1-6	0%
06/05/12	AS/AN	0745	0957	66	0-3	0%
07/09/12	SH	1800	2000	100	3-4	0%
07/10/12	SH	0546	0746	70	0	15%
07/10/12	SH	1803	1943	107	2-4	15%
07/11/12	SH	0625	0745	73	3-6	10%

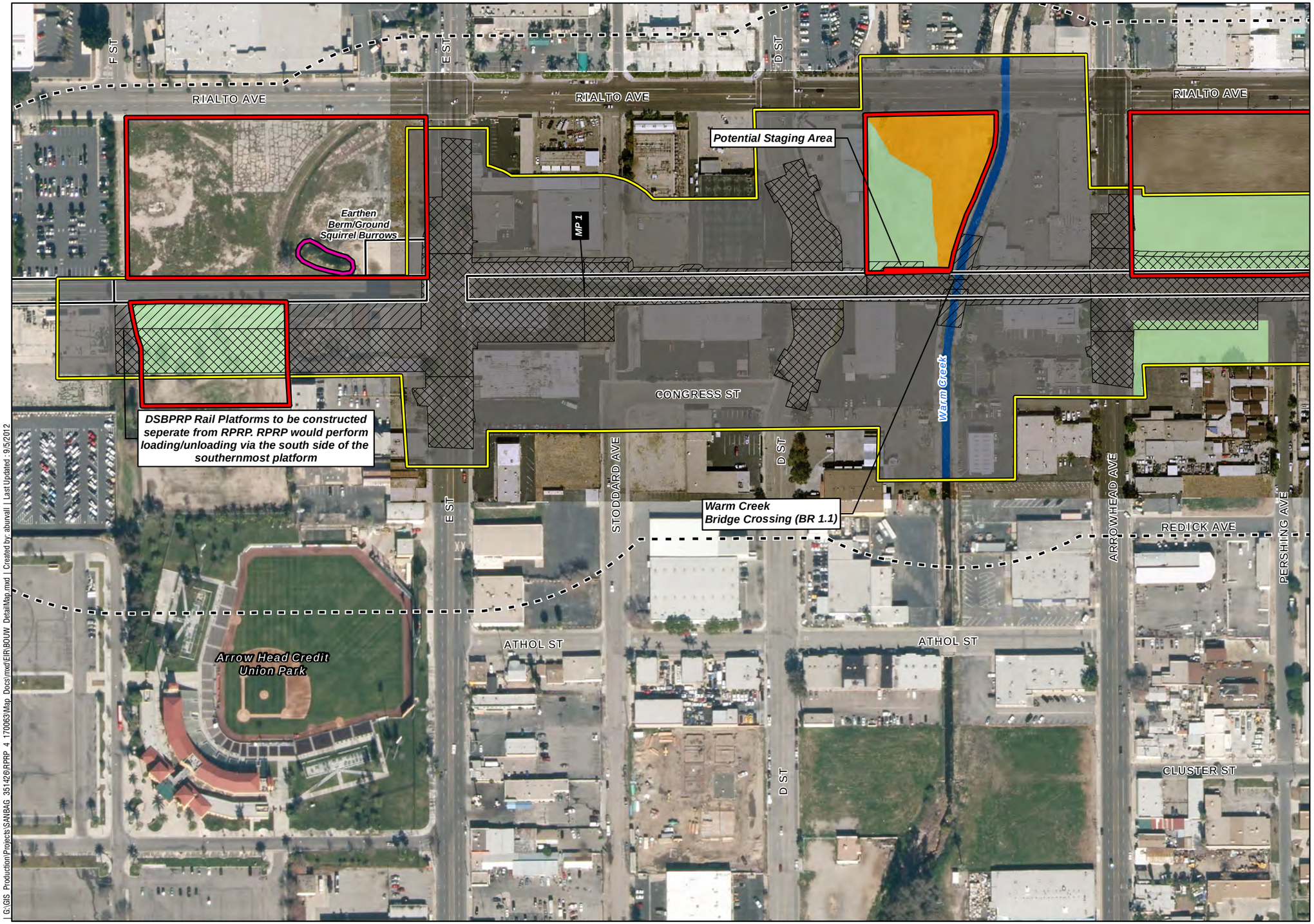
6.0 RESULTS

6.1 HABITAT ASSESSMENT

The survey area supports 14 distinct vegetation communities (Table 2); however, the predominant land cover was indentified as being urban/developed. Vegetation was classified using the R.F. Holland system of natural communities as described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Nomenclature follows Hickman (1993) and Roberts, et al. (2004). The majority of the survey area is made up of paved roadways, man-made structures, adjacent lands that are unvegetated and landscaped parcels. A biological resources map depicting the location of these communities is included as Figures 3a-3t. Of the 14 vegetation communities, seven were identified as supporting suitable habitat for BUOW nesting and foraging within the BUOW survey area: disturbed habitat, flat-top buckwheat scrub, non-native grassland, non-vegetated channel, oak woodland, orchard and vineyards, and urban developed. A description of surveyed habitats is provided below.

Disturbed Habitat (Holland Code 11300)

Disturbed habitat (DH) is primarily used to identify areas of severe impacts to natural communities to the extent where it is no longer sustaining or functioning naturally. These areas have been previously physically disturbed, but continue to retain a soil substrate. Disturbed areas consist of predominantly non-native weedy and ruderal exotic species. This is not a natural community and generally does not provide habitat for wildlife or sensitive species. Examples of disturbed habitat include areas that have been graded, cleared areas for fuel management, staging areas, off-road vehicle trails, and abandoned home sites.



RPRP Study Area

Footprint

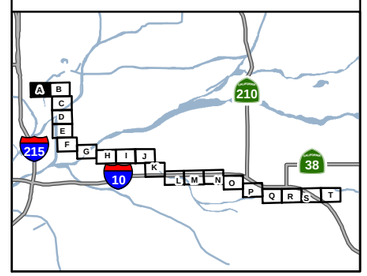
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Live Oak Woodland
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed



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Burrowing Owl Survey Results

Figure 3 A

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

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RPRP Study Area

Footprint

- Permanent Impacts
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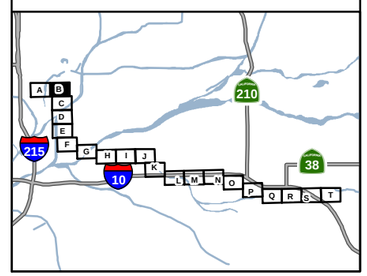
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed



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Burrowing Owl Survey Results

Figure 3 B

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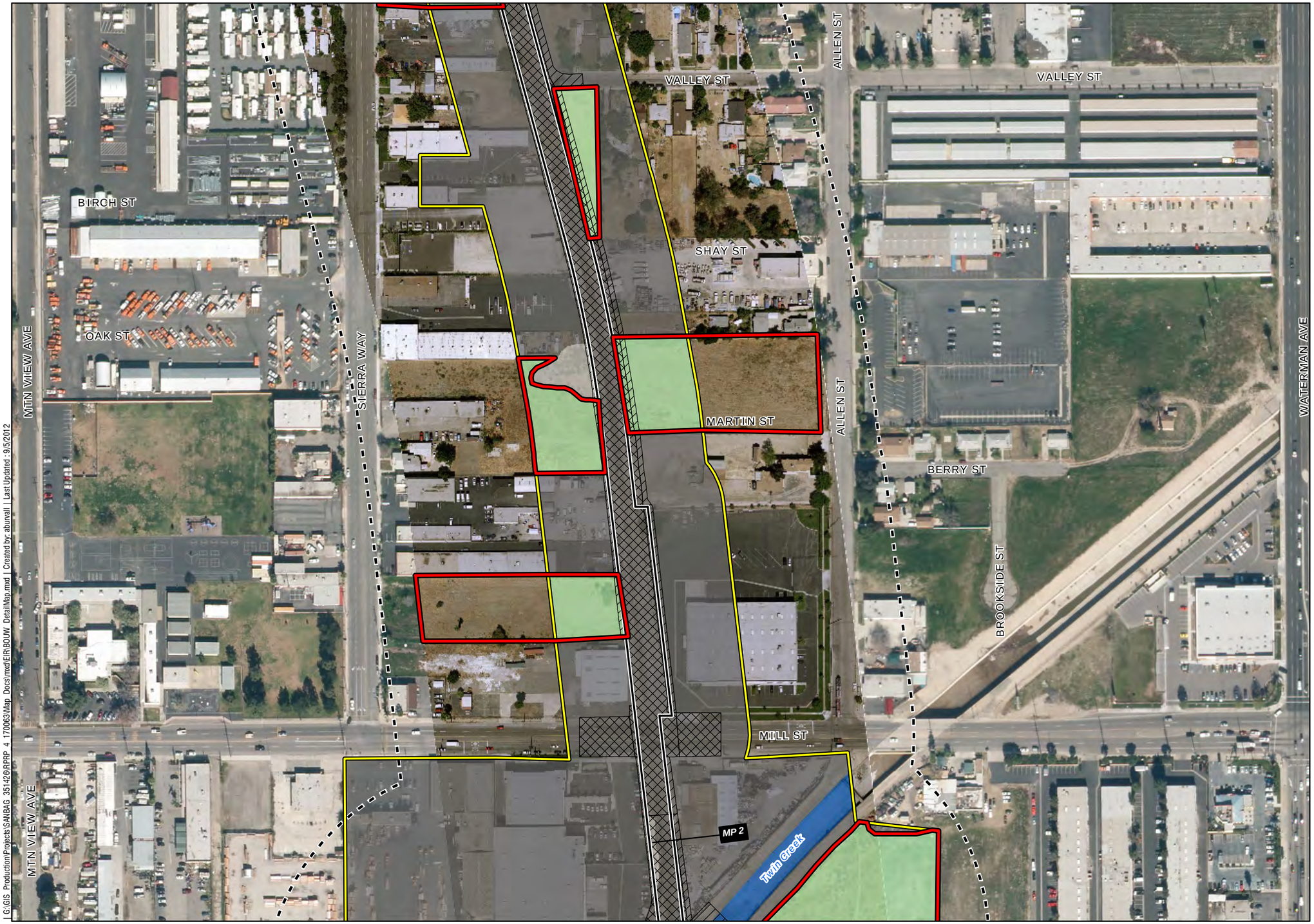

RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

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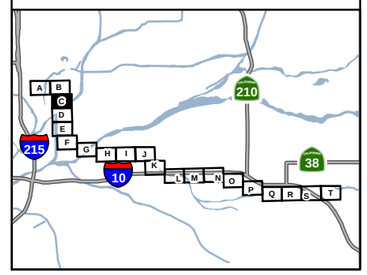

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Burrowing Owl Survey Results

Figure 3 C

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

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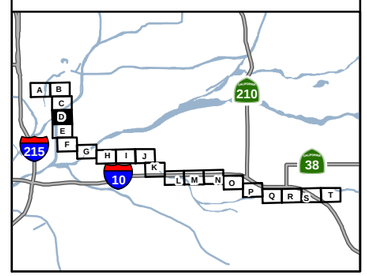
- Urban/Developed



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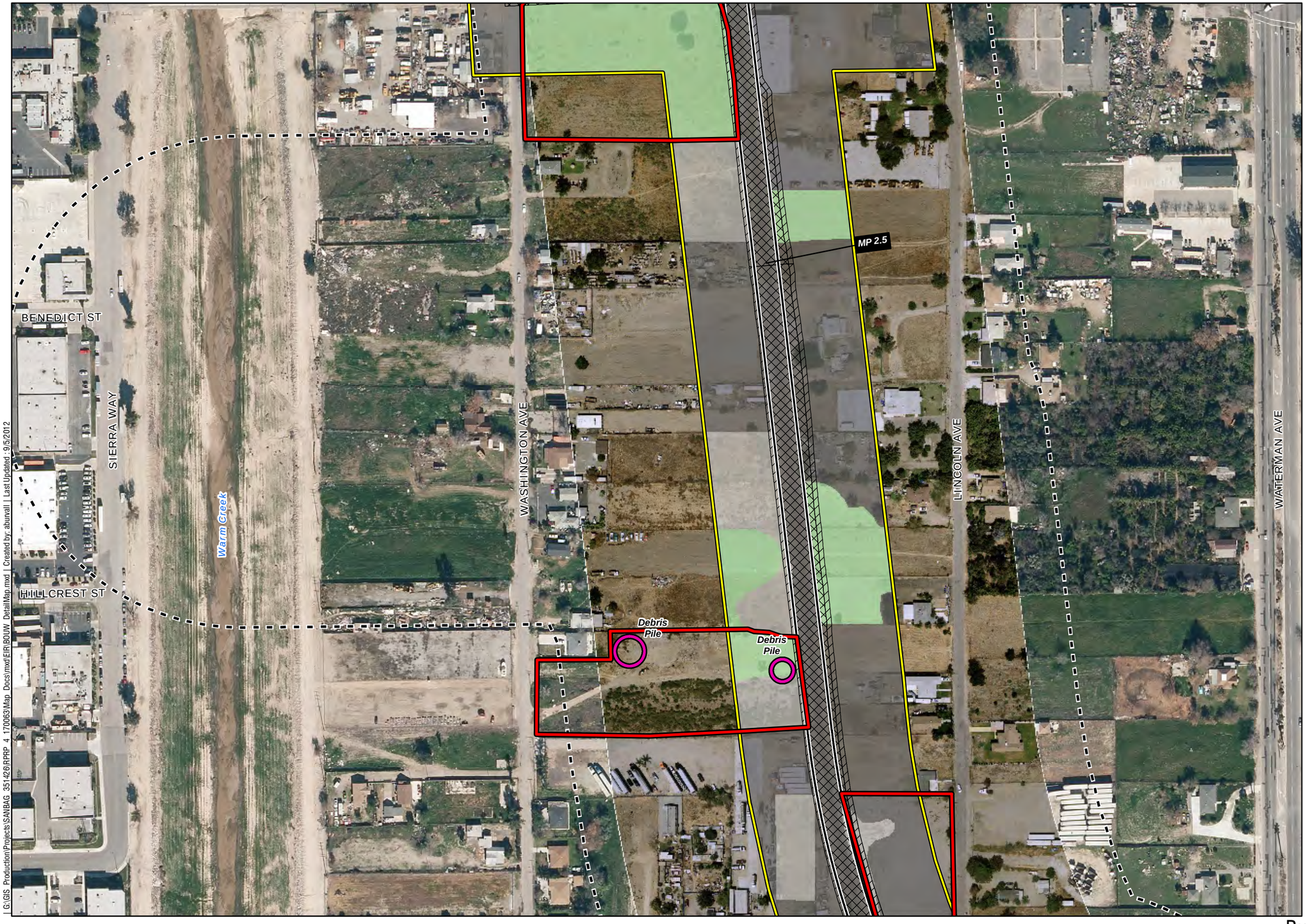
Burrowing Owl Survey Results

Figure 3 D

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



RPRP Study Area

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Burrowing Owl Survey

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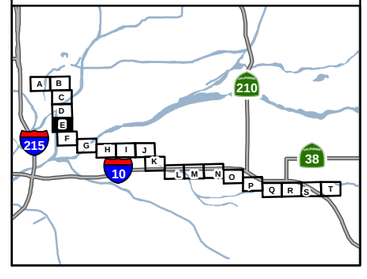

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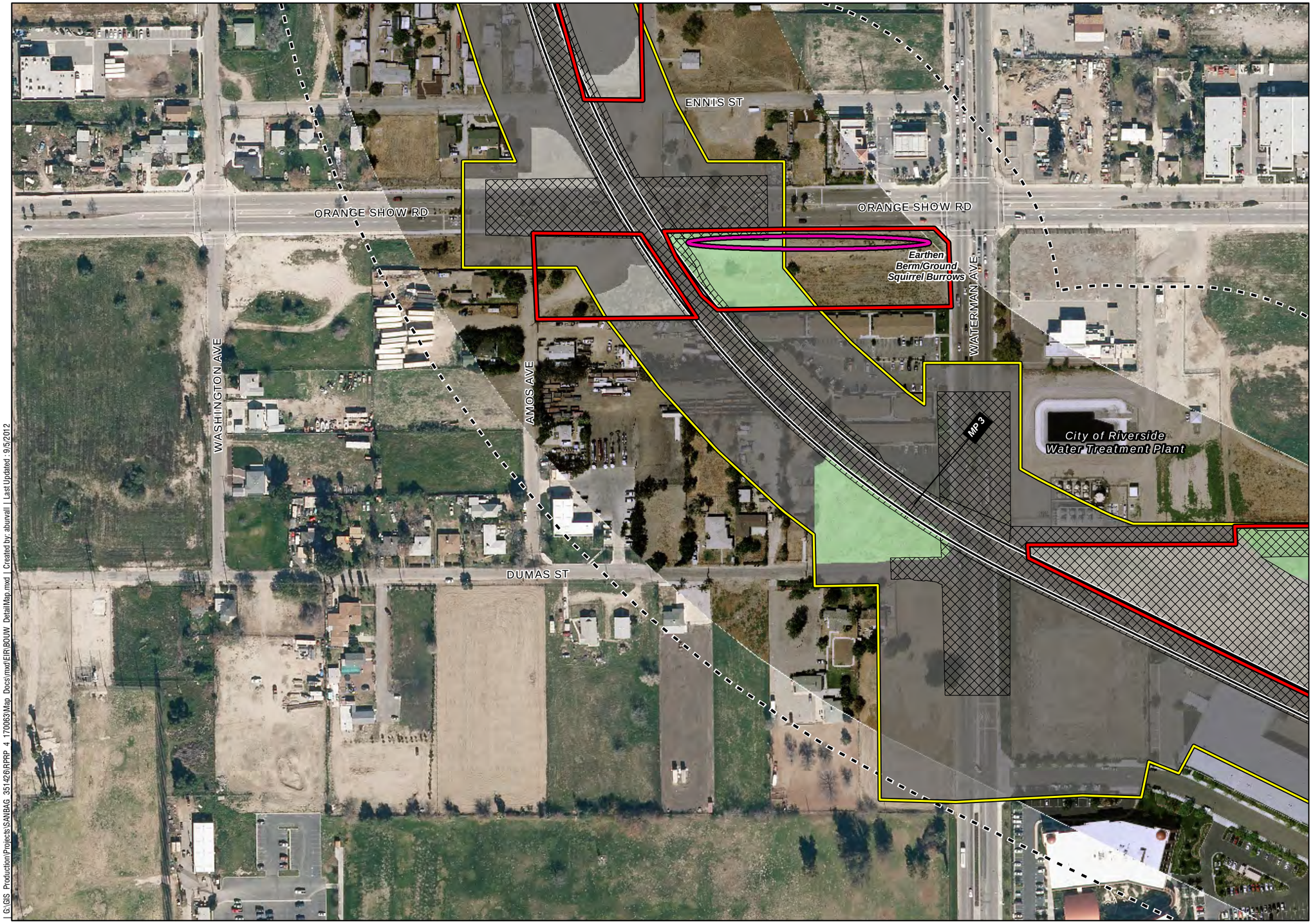
Burrowing Owl Survey Results

Figure 3 E

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



RPRP Study Area

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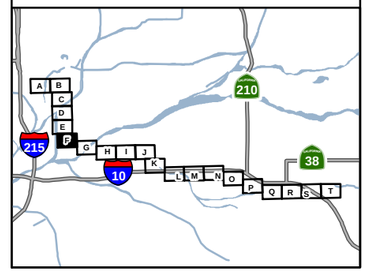

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Burrowing Owl Survey Results

Figure 3 F

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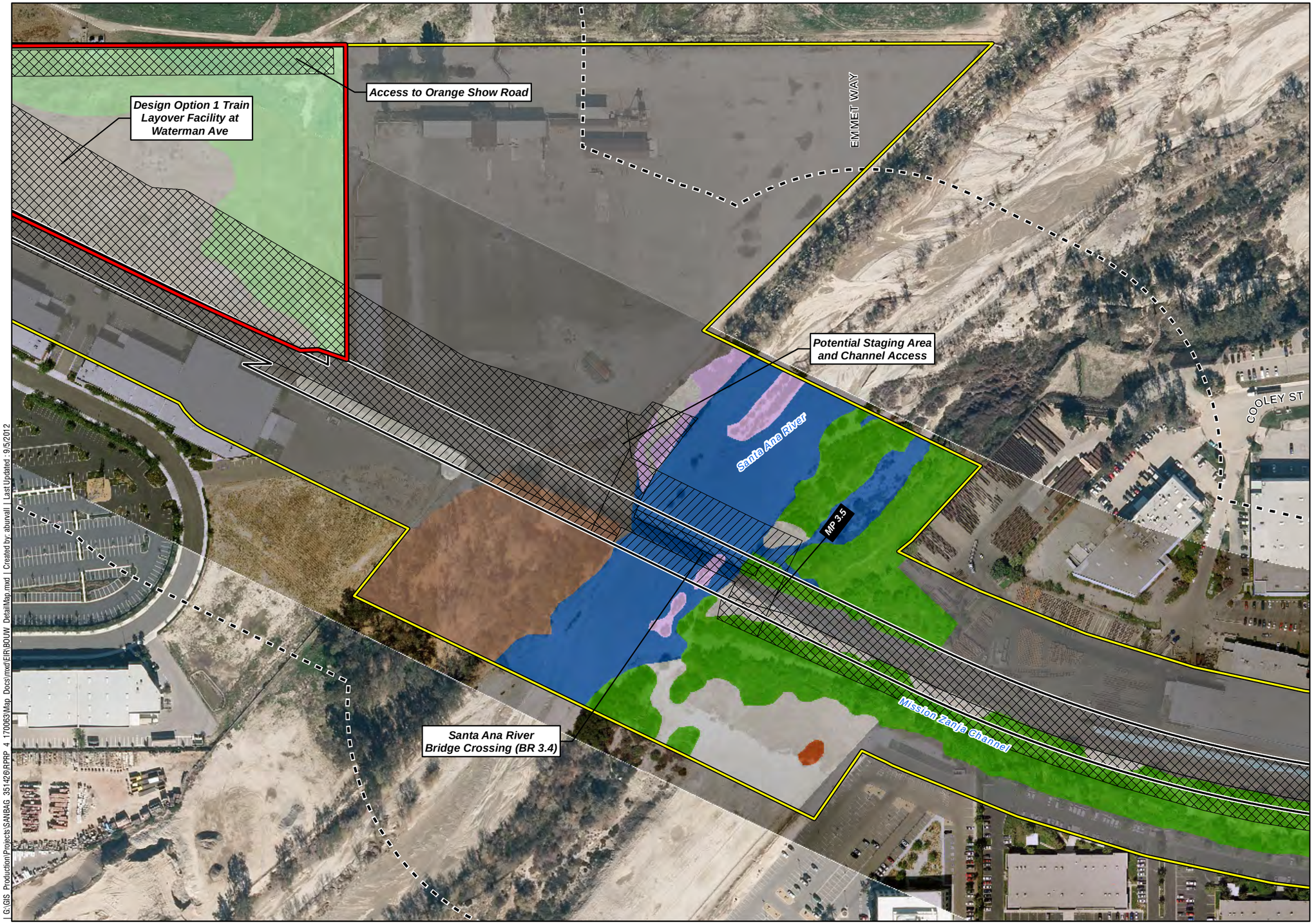

RPRP Study Area

Footprint

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- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

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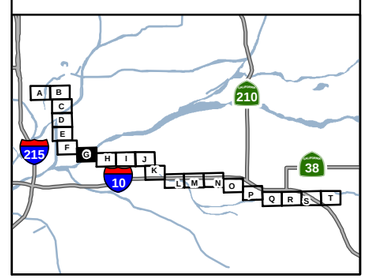

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Burrowing Owl Survey Results

Figure 3 G

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

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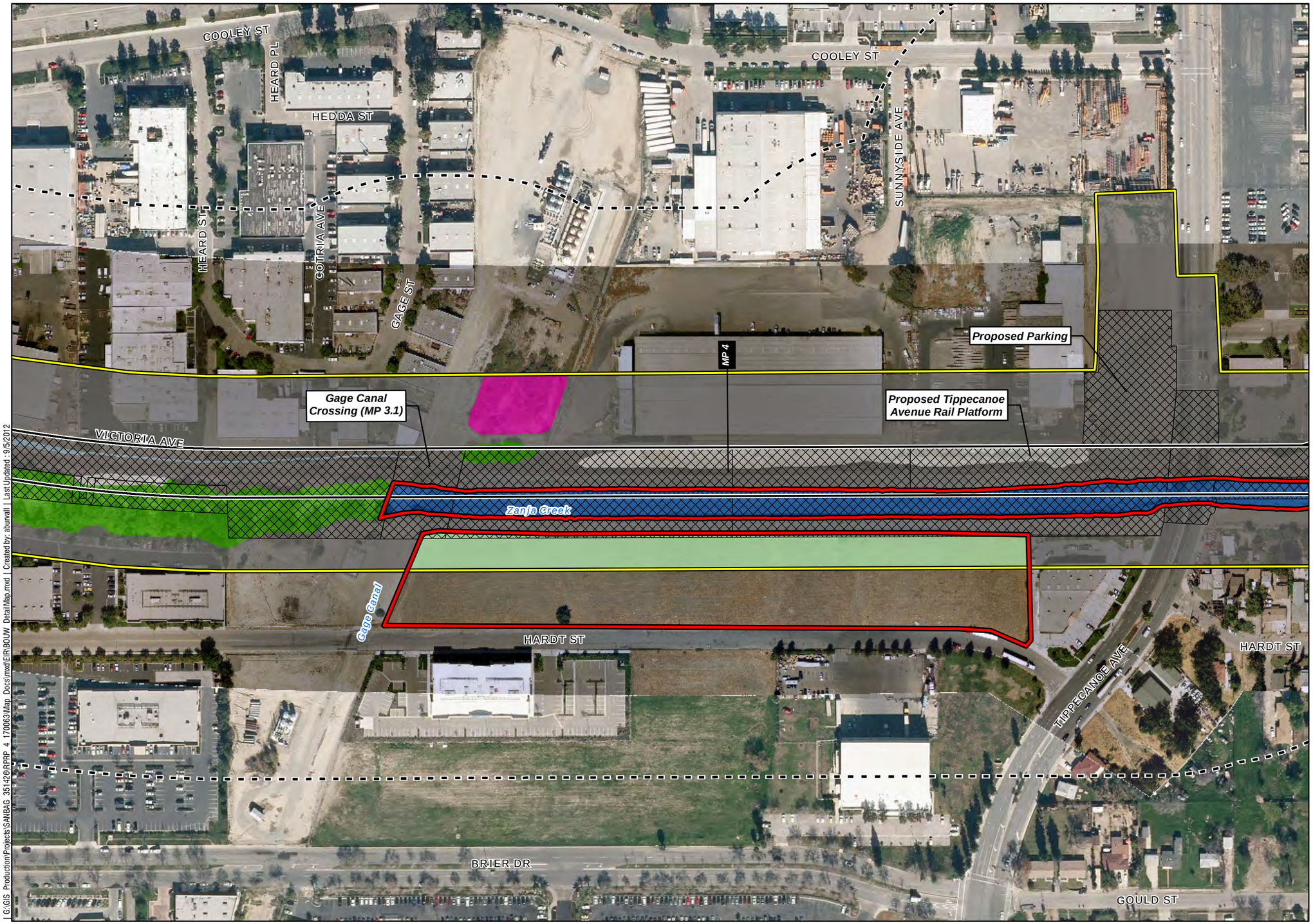


RPRP Study Area

Footprint

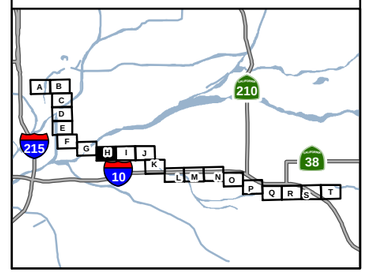
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Live Oak Woodland
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed



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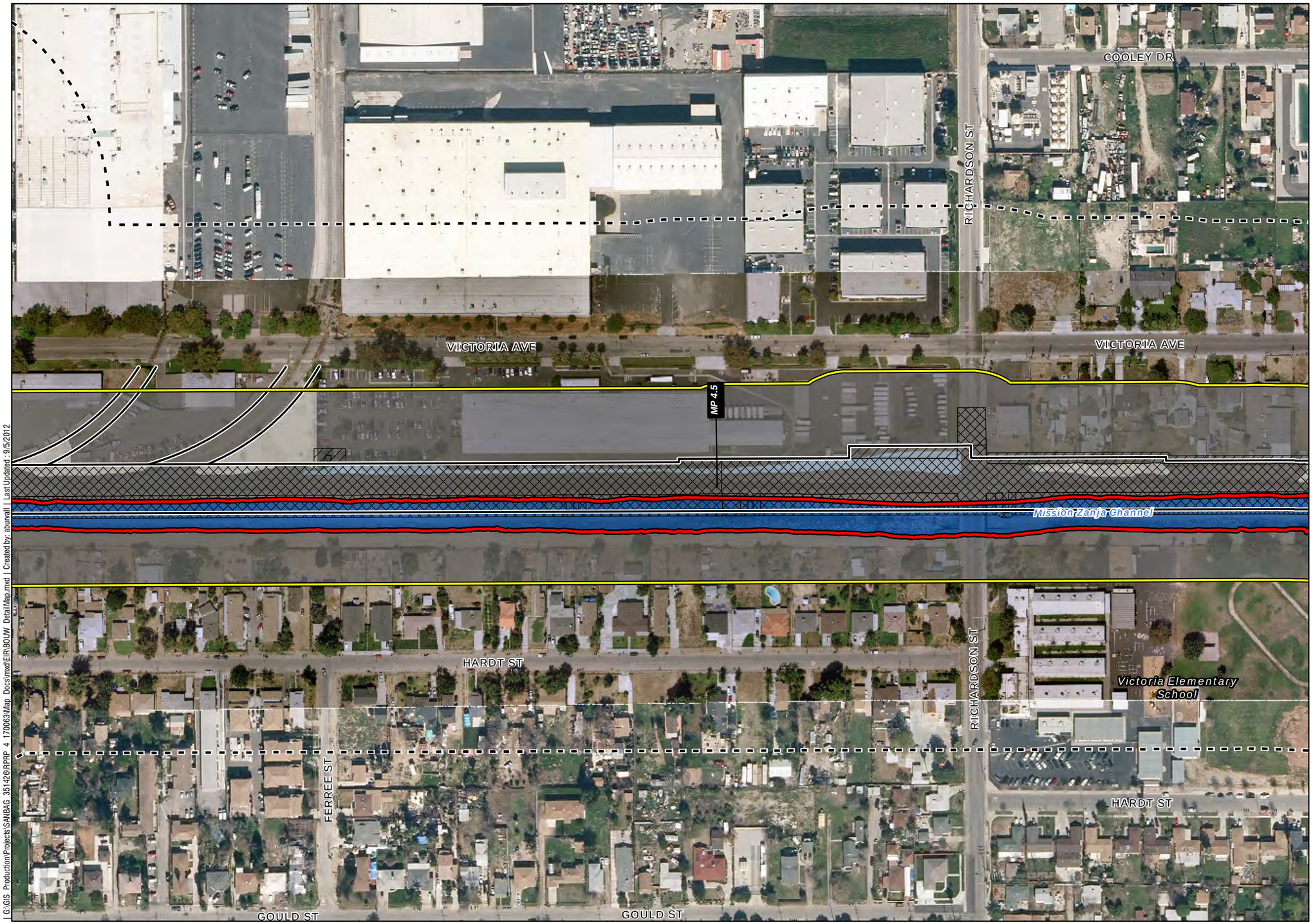
Burrowing Owl Survey Results

Figure 3 H

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



RPRP Study Area

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Burrowing Owl Survey

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- BUOW Feature
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Vegetation Community

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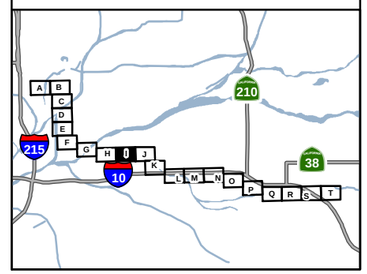

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Burrowing Owl Survey Results

Figure 3 I

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

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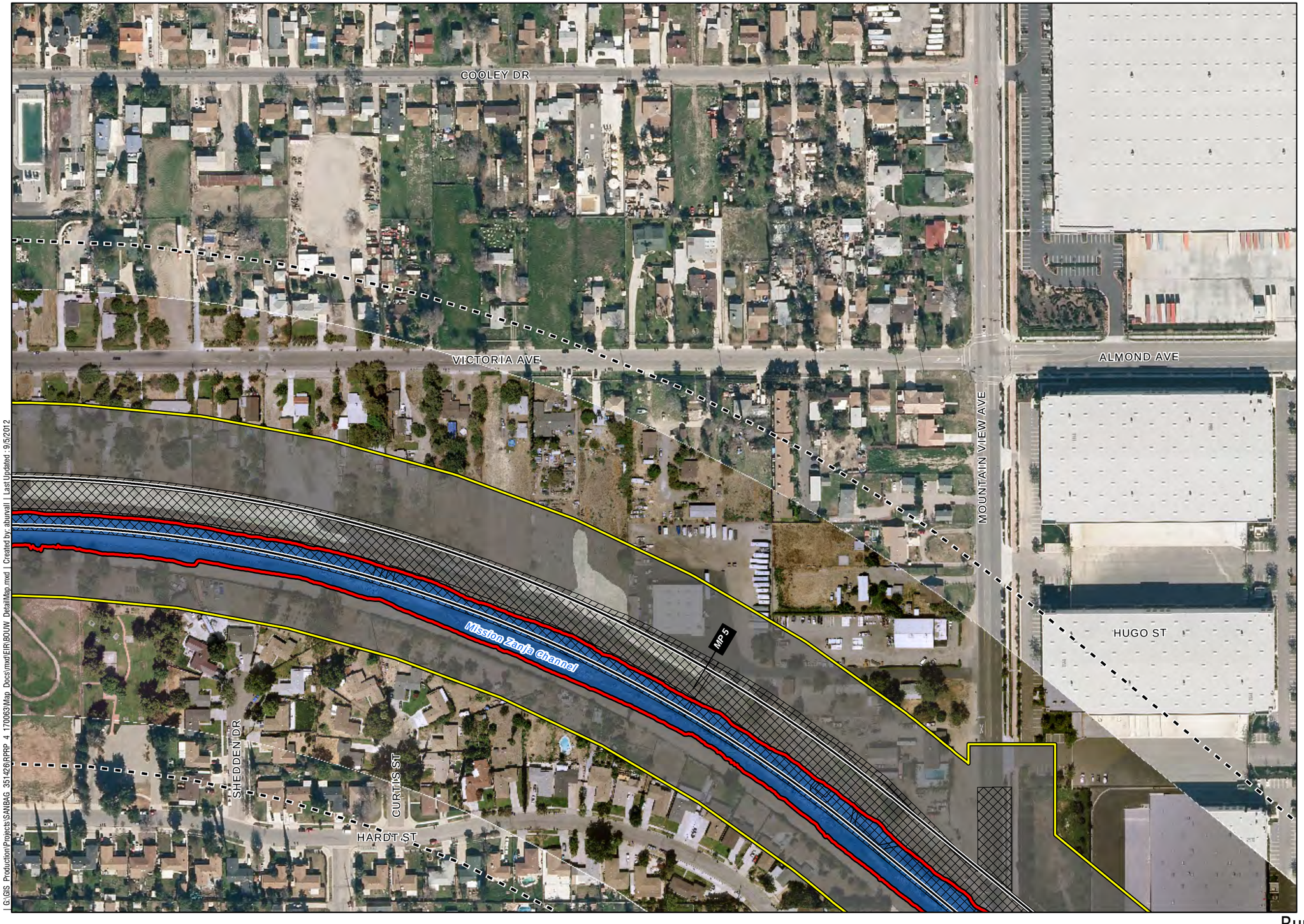

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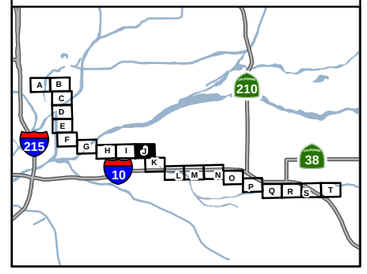

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Burrowing Owl Survey Results

Figure 3 J

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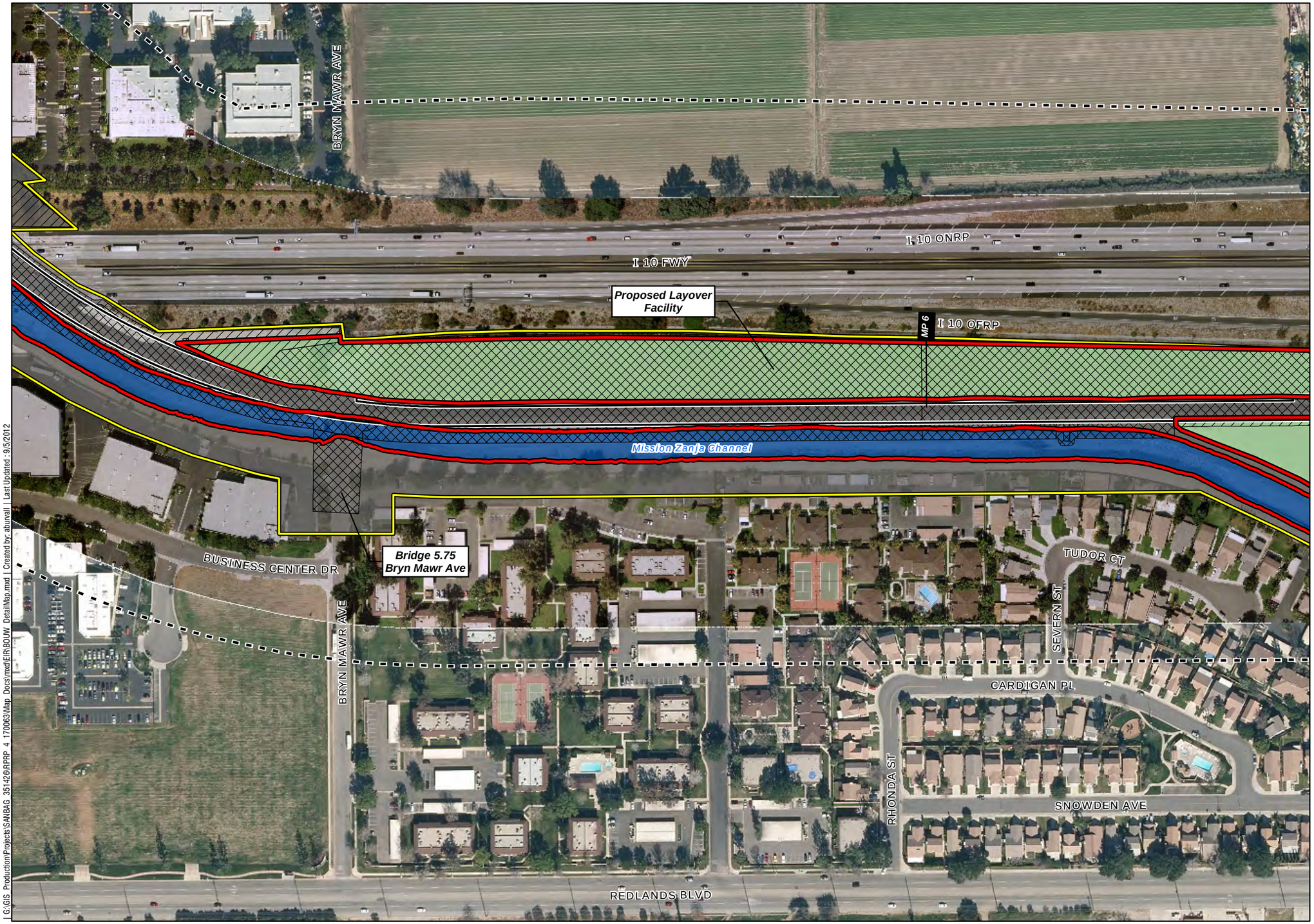

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Burrowing Owl Survey

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- BUOW Feature
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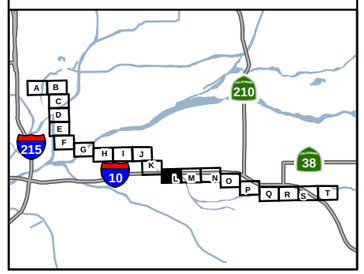

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Burrowing Owl Survey Results

Figure 3 L

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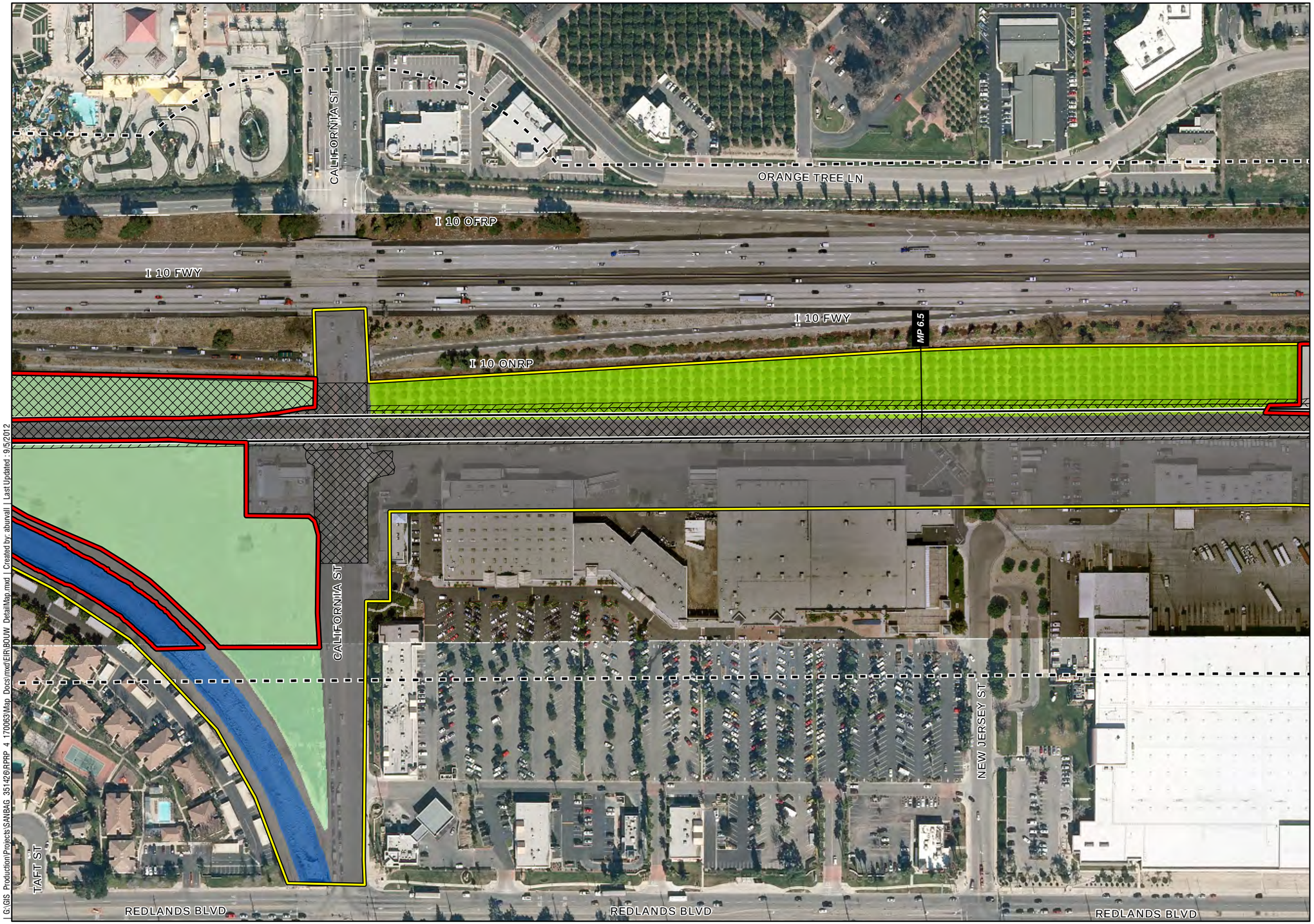

RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

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- Live Oak Woodland
- Mulefat Scrub
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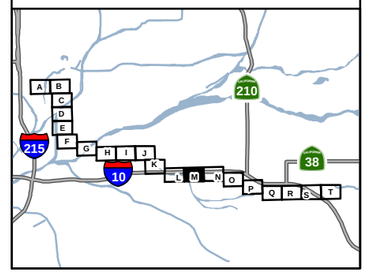
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed



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Burrowing Owl Survey Results

Figure 3 M

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RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
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- Oak Woodland
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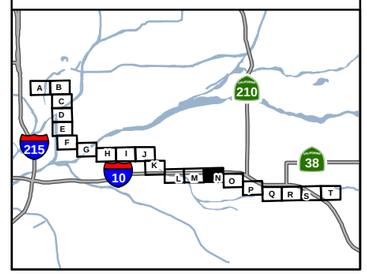
- Urban/Developed



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Burrowing Owl Survey Results

Figure 3 N

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INDUSTRIAL PARK AVE
TRI-CITY CENTER DR
INDUSTRIAL PARK AVE
MP 7.5
REDLANDS BLVD
COLTON AVE
REDLANDS BLVD
ALABAMA ST
KANSAS ST

RPRP Study Area

Footprint
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey
- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community
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- Disturbed Wetland
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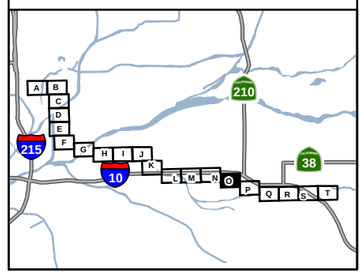
- Urban/Developed



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Burrowing Owl Survey Results

Figure 3.0

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

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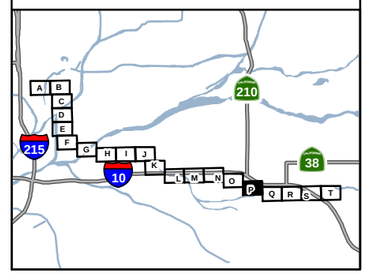

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Burrowing Owl Survey Results

Figure 3 P

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
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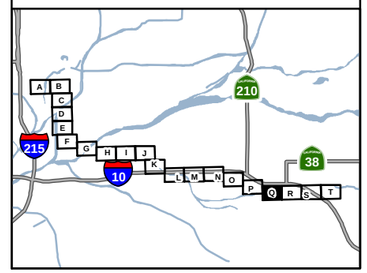
- Tamarisk Scrub
- Urban/Developed



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Burrowing Owl Survey Results

Figure 3 Q

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

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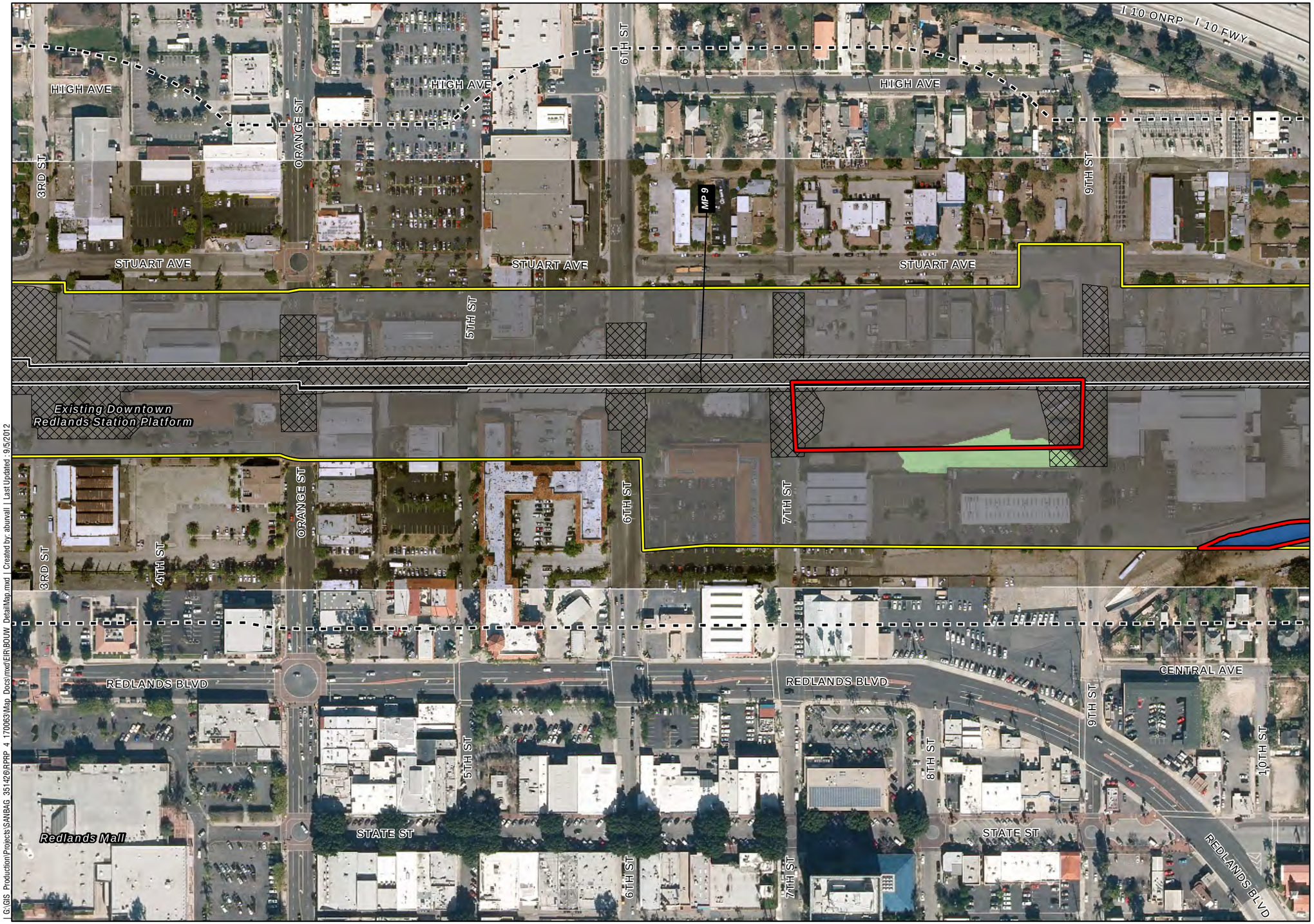

RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

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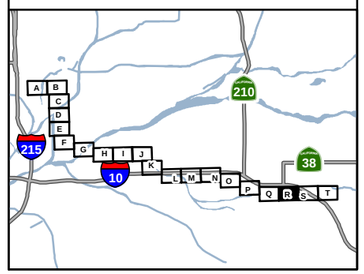

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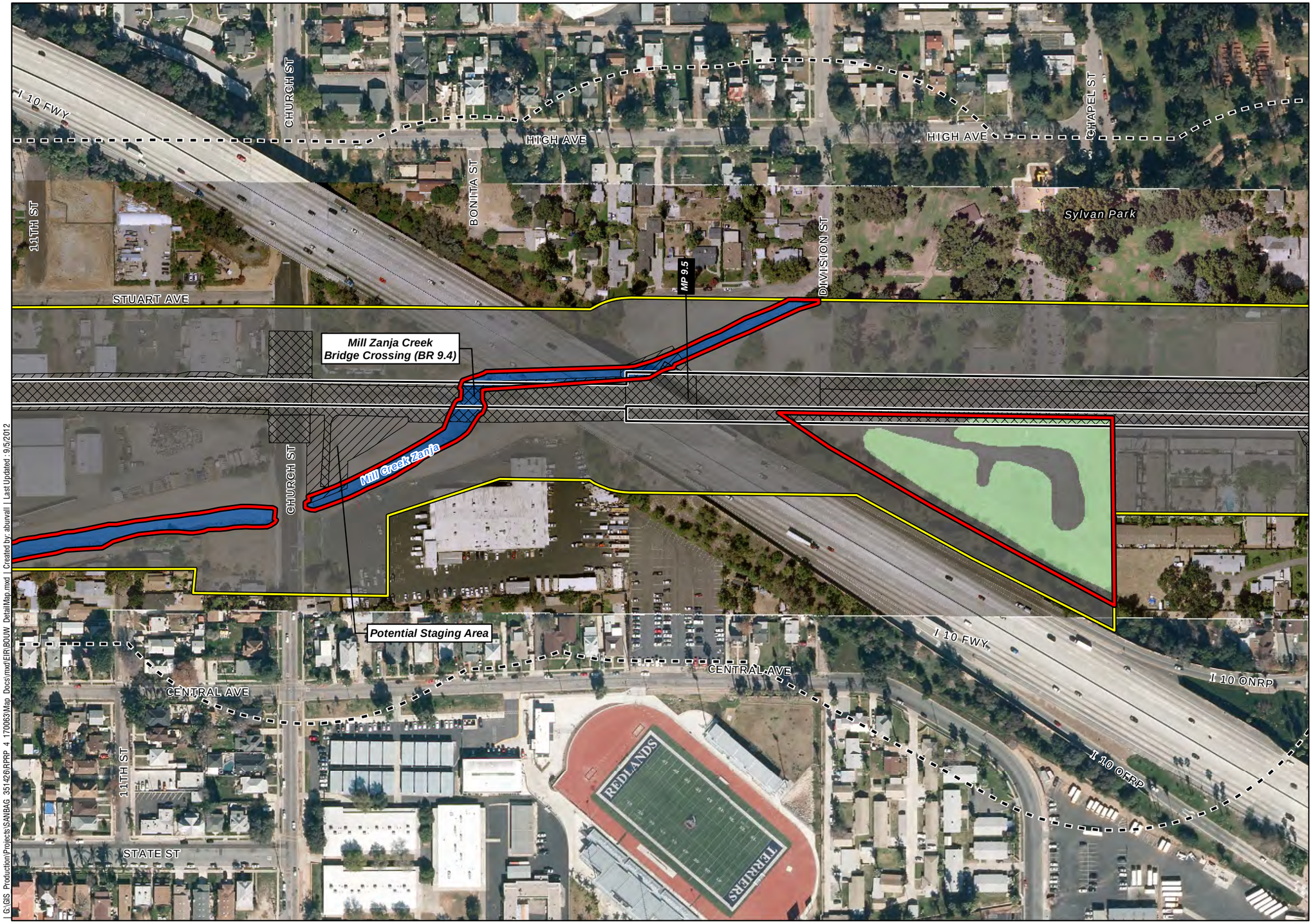
Burrowing Owl Survey Results

Figure 3 R

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



RPRP Study Area

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Burrowing Owl Survey

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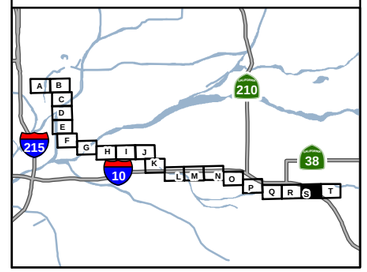

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Burrowing Owl Survey Results

Figure 3 S

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

University of Redlands
SYLVAN BLVD
UNIVERSITY ST
University of Redlands
JEREMY CT
SYLVAN BLVD
GROVE ST
MP 10
Optional Parking
COOK ST
Proposed University of Redlands Rail Platform
CENTRAL AVE
CENTRAL AVE
KAYE CT
COOK ST
GROVE ST
CERO CT
I 10 FWY

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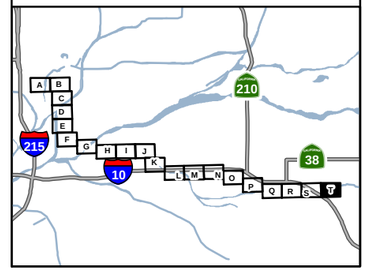

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Burrowing Owl Survey Results

Figure 3 T

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

Table 2. Existing Vegetation within the Project Survey Area

Vegetation Communities	Survey Area Acreage
Disturbed Habitat	24.54
Disturbed Wetland	0.02
Eucalyptus Woodland	2.78
Flat-top Buckwheat Scrub (disturbed)	0.91
Mulefat Scrub	0.04
Non-Jurisdictional Ditch	1.31
Non-Native Grassland	61.90
Non-Vegetated Channel	29.22
Oak Woodland	9.62
Orchard and Vineyards	5.28
Southern Cottonwood Willow Riparian Forest	8.27
Southern Willow Scrub	0.64
Tamarisk Scrub	0.47
Urban/Developed	388.88
Total	**533.88**

*Vegetation was mapped within the Project Area only. These numbers do not include the 500 foot buffer.
**Indicates vegetation community supporting suitable BUOW habitat within the BUOW survey area.

Disturbed habitat in the survey corridor consists of abandoned staging areas, home sites, parking areas, unpaved roads, and areas that have been graded, repeatedly cleared, and/or experienced repeated use that prevents natural revegetation (Appendix A, Photograph 1). Characteristic species include invasive, non-native forbs, such as prickly Russian-thistle/tumbleweed (*Salsola tragus*), London rocket (*Sisymbrium irio*), fennel (*Foeniculum vulgare*). In addition, a limited amount of annual grasses typical of non-native grassland (Holland Code 42200) occur but do not dominate DH. The limited amount of non-native grassland within the DH provides potential habitat for BUOW.

Flat-top Buckwheat Scrub (Holland Code 37000)

Flat-top buckwheat scrub (FBS) consists of a monoculture of successional vegetation that formally supported coastal sage scrub and chaparral in areas that experience continued disturbances. In the survey corridor this community is disturbed, however, it is dominated by flat-topped buckwheat (*Eriogonum fasciculatum*) and Wright's buckwheat (*Eriogonum wrightii)*, with the presence of other species. Other species that were present include annual brome grasses, fescue (*Vulpia* spp.), filaree (*Erodium* spp.), deerweed (*Lotus scoparius*), white sage (*Salvia apiana*), and ranchers fiddleneck (*Amsinckia menziesii* var. *intermedia*).

Within the survey area, FBS occurs within a vacant lot located north of the railroad tracks adjacent to Warm Creek and east of D Street. This habitat is disturbed due to frequent mowing. FBS is potential habitat for BUOW, but the frequent mowing decreases the likelihood that BUOWs will utilize this habitat.

Non-native Grassland (Holland Code 42200)

Non-native grasslands (NNG) are often associated with numerous species of wildflowers and a dense to sparse cover of annual grasses. Characteristic plant species of NNG include oat (*Avena* sp.), rip gut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), foxtail brome *(Bromus madritensis* ssp. *rubens),* four-spot clarkia *(Clarkia purpurea),* sierra shooting star (*Dodecatheon clevelandii*), and California melica (*Melica californica*).

NNG within the survey area is often disturbed and appears to have been previously irrigated and/or cultivated for agricultural purposes. Characteristics that comprise this attribute include the occurrence of previously open space between rows and these areas appear to be currently maintained. These areas are indicated with a "d" before the vegetation community acronym (e.g., d-NNG).

A ground squirrel population constructed a large cluster of burrows within non-native grassland habitat near Twin Creek (Figure 3d, Appendix A, Photograph 2). Throughout the alignment during surveying in this habitat, biologists noticed the presence of several feral cats and makeshift homeless camps. The empty non-native grass fields appear to be regularly mowed and disked of vegetation, which could negatively impact any BUOW population (Appendix A, Photograph 3). These areas, along with the other areas within the Project, have a low potential for BUOW activity.

Non-Vegetated Channel (Holland Code 13200)

Non-vegetated channel (NVC) consists primarily of engineered/leveed channels maintained by the San Bernardino County Flood Control District or local municipality. The channels are either concrete-lined or consist of a fine to coarse sandy or sandy cobbly substrate and are sparsely vegetated or unvegetated. Leveed banks consist of either concrete, concrete-covered cobble, or rock rip rap.

Within the survey area, FVC occurs primarily in Twin Creek, Warm Creek, the Santa Ana River, Mission Zanja Creek (Appendix A, Photographs 4 and 5). Portions of this vegetation community have rodent burrows and provide potential habitat for BUOW (Figures 3a-3t; Appendix A, Photograph 3).

Oak Woodland (Holland Code 71100)

Oak woodland (OW) consists primarily of monotypic stands or various species of oak (*Quercus* sp.) with a poorly developed shrub layer, and well developed herbaceous layer generally dominated by grasses (*Bromes* spp.).

In the survey area this vegetation community consists of uniformly distributed scrub oak (*Quercus berberidifolia*) with an occasional live oak (*Quercus agrifolia*) and a disturbed understory made up of non-native grasses that appear to be maintained. The area provides little habitat value due to the amount of disturbance and the surrounding land uses.

Orchard and Vineyards (Holland Code 18100)

Orchard and vineyards (OV) occurs as an active orange grove located north of the ROW between California and Nevada Streets.

Urban/Developed (Holland Code 12000)

Urban/developed (UD) land is comprised of areas of intensive use with much of the land constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. Developed land is highly modified and characterized by permanent or semi-permanent structures, pavement, unvegetated areas and landscaped areas that require irrigation. Small areas of UD have the potential to support BUOW.

Within the survey corridor, developed areas are comprised of paved roadways, man-made structures, adjacent lands that are unvegetated, or landscapes with a variety of ornamental (typically non-native/ exotic) plants.

6.2 FOCUSED BURROWING OWL SURVEY RESULTS

No BUOW, sign, or active/inactive burrows were observed during 2012 BUOW focused surveys. The few suitable burrows throughout the alignment were extensively surveyed and no sign of owls including pellets, tracks, or feathers were observed. The areas that qualified as low potential were also surveyed and no sign of owls were observed (Figures 3a-3t).

7.0 CONCLUSIONS AND RECOMMENDATIONS

During focused surveys, no BUOW were detected within the Project area and the 500-foot buffer. Throughout the surveys, no evidence of molted feathers, cast pellets, prey remains, eggshell fragments, or excrement near burrow entrances were observed. While the Project area does have open habitat, the lack of large burrows, presence of other birds of prey, regularly mowed and disked fields, makeshift homeless camps, surrounding commercial/urban development and large population of feral cats have created less than ideal conditions to support high populations of BUOW and nesting/foraging habitat.

However, given that burrowing mammals have the potential to excavate burrows over time making the unvegetated areas with exposed soil more suitable, a pre-construction survey is recommended prior to the initiation of construction.

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APPENDIX A

Site Photographs

Photograph 1. Representative view of disturbed habitat with non-native grasses found within the survey area.

Photograph 2. View of a regularly disked field with burrow holes adjacent to commercial development.

Photograph 3. Representative view of non-native grassland found within the survey area. Most of the non-native grasslands are often disked on a regular basis.

Photograph 4. View of the artificially levied Zanja channel. Throughout the channel rodent burrows form along the earthen berm, in the large rock and concrete riprap.

Photograph 5. Stream bank with small rodent burrows, east of Church Street. Urban/Developed habitat in the background.

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APPENDIX B

Faunal Species Observed

Faunal Species Observed

Family	Scientific Name	Common Name
Accipitridae		Kite, Eagle, Hawk Family
	Accipiter cooperii	Cooper's Hawk
	Buteo jamaicensis	Red-tailed Hawk
Anatidae		Geese and Duck Family
	Anas platyrhynchos	Mallard
	Branta canadensis	Canada Goose
Canidae		Dog Family
	Canis lupus familiaris	Domestic Dog
Cardinalidae		Cardinal and Grosbeak Family
	Piranga ludoviciana	Western Tanager
Charadriidae		Plover Family
	Charadrius vociferus	Killdeer
Columbidae		Pigeon and Dove Family
	Columba livia	Rock Pigeon
	Zenaida macroura	Mourning Dove
Corvidae		Crow and Jay Family
	Aphelocoma californica	Western Scrub-Jay
	Corvus brachyrhynchos	American Crow
	Corvus corax	Common Raven
Emberizidae		Sparrow Family
	Melospiza melodia	Song Sparrow
	Zonotrichia leucophrys	White-crowned Sparrow
Felidae		Cat Family
	Felis catus	Domestic Cat
Fringillidae		Finch Family
	Carpodacus mexicanus	House Finch
	Spinus psaltria	Lesser Goldfinch
Icteridae		Blackbird and Oriole Family
	Euphagus cyanocephalus	Brewer's Blackbird
	Sturnella neglecta	Western Meadowlark
Leporidae		Hare and Rabbit Family
	Sylvilagus floridanus	Cottontail Rabbit
Mimidae		Mockingbird and Thrasher Family
	Mimus polyglottos	Northern Mockingbird
Parulidae		Wood Warbler Family
	Setophaga coronata	Yellow-rumped Warbler
Passeridae		Old World Sparrow Family
	Passer domesticus	House Sparrow
Ptilogonatidae		Silky Flycatcher Family
	Phainopepla nitens	Phainopepla

Family	Scientific Name	Common Name
Sciuridae		Squirrel Family
	Otospermophilus beecheyi	Ground squirrel
Sturnidae		Starling Family
	Sturnus vulgaris	European Starling
Trochilidae		Hummingbird Family
	Calypte anna	Anna's Hummingbird
Turdidae		Thrush Family
	Turdus migratorius	American Robin
Tyrannidae		Flycatcher Family
	Tyrannus verticalis	Western Kingbird
	Sayornis nigricans	Black Phoebe
Vireonidae		Vireos Family
	Vireo bellii pusillus	Least Bell's Vireo

APPENDIX J

Santa Ana Sucker Habitat Assessment

Santa Ana Sucker Habitat Evaluation

Redlands Passenger Rail Project

5 October 2012

Cardno ENTRIX

Shaping the Future

Santa Ana Sucker Habitat Evaluation

Redlands Passenger Rail Project

5 October 2012

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Acronyms

BMP	best management practice
CDFG	California Department of Fish and Game
CIP	cast in place
CISS	concrete in steel shell
cm	centimeter
fps	feet per second
ins	inches
PCE	primary consituent element
PRD	Permit Registration Document
ROW	right-of-way
RPRP	Redlands Passenger Rail Project
SANBAG	San Bernardino Association of Governments

SCRRA	Southern California Regional Railroad Authority
SWPPP	Storm Water Pollution Prevention Plan
USFWS	U.S. Fish and Wildlife Service

1 Introduction

The Redlands Passenger Rail Project (RPRP) would implement rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. One part of this project is to remove and replace the existing rail bridge over the Santa Ana River. This report evaluates habitat for the Santa Ana sucker (*Catostomus santaanae*) in this segment of the river and the potential for impacts from construction and operation of the project on this species and its designated critical habitat.

2 Project Description

The RPRP would involve implementation of rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. The Project would include the construction of track improvements to facilitate train movements along a single track through the rail corridor with an approximately 10,000-foot-long section of passing track or siding, from just west of Richardson Street to just east of California Street (MP 5.5 to MP 7.4). The proposed track ballast and sub-grade along the 9-mile project corridor would be constructed to 50 feet in width, sufficient to support a parallel maintenance road. This would require demolition and replacement of the existing track. These improvements would adhere to standards established by the BNSF Railway and Southern California Regional Railroad Authority (SCRRA) for the rail, rail ties, ballast and subballast materials, grade crossing panels, placement of drainage structures and retaining walls, and horizontal and vertical clearances.

The Project would be constructed within an existing railroad right-of-way (ROW) owned by the San Bernardino Associated Governments (SANBAG), which averages 50 to 100 feet in width except in portions of downtown Redlands where the ROW is less than 40 feet wide. The rail improvements would also include the construction of a new train signaling and communications system.

The Project would require the replacement or retrofitting of up to six structural crossings to facilitate the loading requirements of the Metrolink trains and track foundation. Five of the six structural crossings consist of existing bridge structures, including the Santa Ana River crossing (Bridge 3.4). That existing Santa Ana River bridge would be replaced, at the same location, with a new steel beam bridge up to 365 feet long. The work would temporarily affect up to 0.84 acre and permanently affect up to 0.61 acre of Santa Ana River bed and banks (Figure 1). Construction of this crossing would take approximately nine months.

Construction access/staging would occur from the north end of the western bank. Access to the eastern bank would occur via construction of a temporary bridge crossing (earthen fill) from the west (see Figure 1). Existing bridge and bridge piers (support structures = bents) would be removed following installation of the new bridge piers. The new bridge would have up to five bents placed within the river channel compared to three (plus one at each bank) at the existing bridge, and the piers would be longer to support a second future rail track (see Figure 2). The new structural supports would be constructed behind an encircling temporary cofferdam of sheet piles or similar method, such as the use of Concrete in Steel Shell (CISS) piles, depending on contractor preference. The foundation would consist of reinforced concrete supported by bored and cast-in-place (CIP) pilings, with conventional reinforced CIP concrete piers extending up to the bridge deck. In the event that water is present in the river, it would be diverted around the work area. Best management practices (BMPs) as detailed in the project Storm Water Pollution Prevention Plan (SWPPP) will be implemented to ensure that construction materials, including concrete, do not come in contact with the river water. To minimize the potential for debris to fall into the Santa Ana River during bridge construction, a debris containment system would be installed under the bridge to catch any falling debris. If flow is present and as an additional precaution, a boom would be strung across the water feature to keep any material that escapes the containment system from being carried downstream.

Erosion, sedimentation, and hazardous materials spills or leakage from construction vehicles is also considered a potential impact to water quality. To address these issues, the project will require the contractor to conduct vehicle refueling within the staging/assembly area, a minimum of 50 feet from wetland areas. The project will include preparation of a SWPPP as well as other Permit Registration Documents (PRDs) by the project engineer or contractor. The SWPPP will identify BMPs to address potential short-term impacts and post-construction (long-term) measures to be implemented for the

Figure 1 RPRP Footprint SAR Bridge 3.4

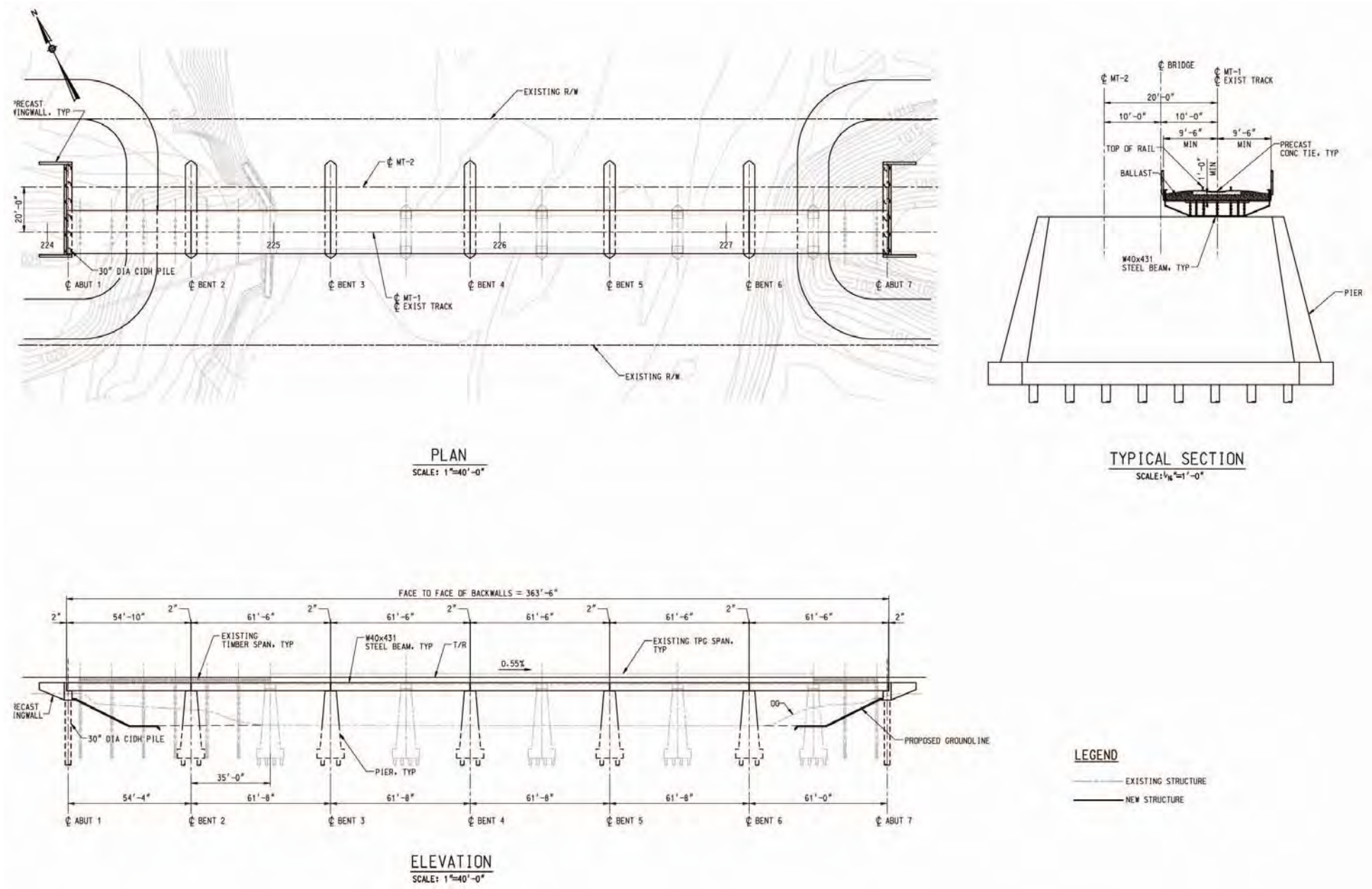

Figure 2 RPRP Bridge 3.4 Plan

project. Stormwater pollution prevention BMPs included as a part of the SWPPP would be implemented in accordance with the California Stormwater Construction Handbook (latest edition) and the Construction General Permit Order no. 2009-0009-DWQ. Construction could also involve limited dredging of material from the channel bed and/or excavation along the adjacent banks. These activities could also include the placement of fill including concrete and riprap. To minimize construction activity in the river channel, the structural improvements would be constructed in two or more increments to minimize disturbance to the channel bottom and allow for the safe passage of water flow. A similar approach would be employed for the removal of any existing structures.

If flow is present during construction, temporary diversion of water may be required. The diversion may consist of a temporary bypass using a pipe, flume, excavated channel, or alternative method that temporarily reroutes water around the construction area. The method would ultimately be at the discretion of the construction contractor. Surface water diversion BMPs would be required to prevent or reduce mingling of construction-related runoff with upstream non-construction-related runoff so as to prevent the introduction of sediment, nutrients, pesticides, and/or other pollutants to local waterways during construction.

Operation of the RPRP would involve trains every 30 minutes in the peak periods and every hour in the off-peak period. This would translate to 25 average daily round trips along the alignment during weekdays. Maintenance of the rail ROW is currently the responsibility of BNSF, which is the current operator of the rail line. This includes routine maintenance of the track and track ties, grade crossings, and communication system. Vegetation management and weed abatement would also be required along the ROW. A contractor hired by SANBAG would conduct all maintenance activities and inspections, including those for the Santa Ana River Bridge, in accordance with SCRRA/Metrolink and BNSF standard practices.

3 Santa Ana Sucker Description

3.1 Status

The Santa Ana sucker was federally listed by the U.S. Fish and Wildlife Service (USFWS) as a threatened species on April 12, 2000 (65 FR 19686, USFWS 2004). In California, it is listed as a species of special concern (California Department of Fish and Game (CDFG) 2011).

3.2 Species Description

The Santa Ana sucker, a member of the sucker family of fishes (Catostomidae), is a small, short-lived fish generally less than 6.3 inches (ins) (16 centimeters (cm)) in length; however, they have been collected at lengths up to 8 ins (20.3 cm) (Russell 2010, as cited in USFWS 2012). Santa Ana suckers have downward oriented mouths with fleshy, protrusible lips and jaws with cartilaginous scraping edges which allow them to suck up small invertebrates, algae, detritus, diatoms, fish eggs, and other organic matter for food (Moyle 2002, USFWS 2004). Coloration is typically silvery-white on the belly and dark gray on the sides and back, with irregular dorsal blotches on the sides and faint patterns of pigmentation arranged in lateral stripes (Moyle 2002).

The Santa Ana sucker is usually found in permanent pools and runs of small to medium size (less than 7 meters in width), and in water ranging in depth from a few centimeters to greater than a meter (USFWS 2004). The preferred substrate for this species includes gravel, rubble, and boulder and is generally coarse; although, individuals have been found in streams with sand/mud substrates (USFWS 2004). Flow throughout the habitat is described as slight to swift; some populations occur in streams that are subject to periodic and severe flooding (USFWS 2004). This species prefers overhanging riparian plants for shelter, and does not require streamside cover when larger, deeper holes and riffles are present for refuge (USFWS 2004).

Santa Ana sucker spawning may occur between mid-March and early-July, with peak activity usually in April (Moyle 2002). Spawning habitat typically consists of gravelly-riffles. The fertilized eggs adhere to the substrate and hatch within 30 days. Females are very fecund and can produce between 4,423 and 16,151 eggs (USFWS 2004). The high fecundity of the Santa Ana sucker, in combination with early sexual maturity and a protracted spawning period allows this species to quickly repopulate streams following periodic flood events that could decimate populations (Moyle 1976 as cited in USFWS 2000). Santa Ana suckers in the Santa Clara River generally mature during their second summer and die at the end of their third summer although some individuals have been observed to survive through a fourth or even fifth summer (Moyle 2002, Drake 1988 as cited in USFWS 2012).

3.3 Distribution

Historically, the Santa Ana sucker was native to the rivers and larger streams of the Los Angeles Basin (Los Angeles, San Gabriel, and Santa Ana river drainages) in Los Angeles, Orange, Riverside, and San Bernardino counties (USFWS 2000). There are very few records of the historic range of this species, but it is presumed that Santa Ana suckers ranged from near the Pacific Ocean to the uplands of the Los Angeles and San Gabriel river systems and at least up to the San Bernardino National Forest boundary in the Santa Ana River (Swift et. al. 1993 as cited in USFWS 2000).

Currently, native noncontiguous populations of Santa Ana suckers occur in the Santa Ana River, lower Big Tigunga Creek in the Los Angeles River drainage, and East, West, and North forks of the San Gabriel River (USFWS 2012). A small population is located in the Santa Clara River, although it is believed that this is an introduced population (USFWS 2004). In the Santa Ana River, Santa Ana suckers are found in the lower river and its tributaries from Prado Dam to near California State Highway 90 and in the middle

river and its tributaries from south of La Cadena Drive, where wastewater discharges provide perennial flow, to Prado Dam. It is believed that the Santa Ana sucker has lost approximately 70 percent of its historical native range in the Santa Ana River watershed and 75 percent of its historic range overall (USFWS 2000).

3.4 Critical Habitat

On December 14, 2010 (75 FR 77962–78027, USFWS 2010), critical habitat was revised for Santa Ana sucker, designating critical habitat in Los Angeles, Orange, Riverside, and San Bernardino counties, California. The designated critical habitat includes approximately 9,331 acres (3,776 hectares) of Federal, State, and private lands. Three units were designated (Unit 1: Santa Ana River, Unit 2: San Gabriel River, and Unit 3: Big Tujunga Creek, a tributary to Los Angeles River). Designated areas that were occupied by the Santa Ana sucker at the time of listing contain the physical and biological features essential to the conservation of Santa Ana sucker and may require special management considerations or protection. Additionally, certain areas have been designated critical habitat that are outside areas occupied by the Santa Ana sucker at the time of listing that are essential for conservation of the species. These areas are essential because they contribute to the maintenance of the physical and biological features within the occupied critical habitat by providing sources of water and coarse sediments necessary to maintain all life stages of the Santa Ana sucker (USFWS 2012).

The primary constituent elements (PCEs) for the Santa Ana sucker are:

1. A functioning hydrological system within the historical geographic range of the species that experiences peaks and ebbs in water volume (naturally or regulated) that encompasses areas that provide or contain sources of water and coarse sediment necessary to maintain all life stages, including adults, juveniles, larvae, and eggs.
2. Stream channel substrate with a mosaic of loose sand, gravel, cobbles, and boulders in a series of riffles, runs, pools, and shallow sandy stream margins necessary to maintain various life states of the species.
3. Water depths greater than 1.2 ins (3 cm) and bottom water velocities greater than 0.01 feet per second (0.03 meters/second).
4. Clear or only occasionally turbid water.
5. Water temperatures less than 88°F (30°C).
6. Instream habitat that includes food sources (e.g., phytoplankton, zooplankton, and aquatic invertebrates) and associated vegetation (e.g., aquatic emergent plants and adjacent riparian vegetation) that provides shading to reduce water temperature, shelter during periods of high water velocity, and protective cover from predators.
7. Areas within perennial stream courses that may be periodically dewatered, but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted.

All occupied designated critical habitat units contain these PCEs in the appropriate quantity and spatial arrangement essential to conservation of the species.

The proposed project is located near the upstream edge of Unit 1, Subunit 1B, in an area that is not currently occupied due to the barrier to upstream movement at La Cadena Drive. This subunit was considered occupied at the time of listing and provides sources of water (PCE 1) and coarse sediment (PCE 2) for downstream occupied habitat (USFWS 2010). Because the project site is not currently occupied, PCEs 3-7 do not apply.

4 Project Site Evaluation

4.1 Description of site

The existing rail bridge over the Santa Ana River is located about mid way between the East Orange Show Road (upstream) and South Waterman Avenue (downstream) road crossings, and is approximately 0.9 mile downstream of Tippecanoe Avenue. The active river channel is approximately 250 feet wide at the rail crossing but wider upstream and narrower downstream. Flow is intermittent at this location and results from storm runoff during the rainy season and releases from Seven Oaks Dam in the dry season prior to fall/winter rains. The remainder of the time the channel is dry.

Substrate at the project site is primarily sand with some coarser material mixed in. Sand dominates the river bed downstream to the Prado Basin. Course materials (gravel and cobbles) from upstream sources pass through the project area during larger runoff events when water velocity is high enough to transport them.

A number of barriers to upstream fish movement occur downstream of the project site. These include grade control structures at the I-10 freeway crossing and La Cadena Drive. Downstream distance to occupied habitat from the project site is approximately 2.25 miles.

The river banks support a mix of native and non-native shrubs and trees.

4.2 Critical habitat functions

As noted above, the project area is within critical habitat Unit 1, Subunit 1B in an area that is not currently occupied by the species but provides transit of water (PCE 1) and coarse materials (PCE 2) downstream to occupied habitat. The existing rail bridge supports do not appear to substantially affect water or sediment transport downstream to occupied habitat based on hydraulic modeling which shows that the water surface elevation would be 1017.3 feet with a velocity of 15.6 feet per second (fps) at the bridge during a 100-year flow event (HDR 2012). The existing bridge has three supporting piers in the river channel, another one on the south bank, and a wingwall on the north bank (Figure 2). The piers are 6.5 feet wide and approximately 25 feet long (oriented parallel to river flow). The small area taken up by the piers is less than 9 percent of the river width from base of bank to base of bank. It is even less for bank-full width.

5 Potential for Project Effects

5.1 Construction

Construction of the new bridge would result in disturbances within the river channel and on the banks related to access, installation of temporary cofferdam(s) or CISS piles, dredging in the river bed and/or excavation along the banks, and removal of the cofferdam(s) or CISS piles when construction is completed. Dredging and/or excavation of the river banks under the bridge to widen the channel would have the potential to cause suspension of fine sediments if the work occurs in flowing water or the disturbed soils later are exposed to flowing water before those soils are stabilized. Cofferdam or CISS pile installation activities would temporarily disturb the river bed and would isolate a small amount of the bed from flows since the work could be conducted during at least some periods of flow. These small disturbances would not adversely affect water or sediment transport downstream. The temporary cofferdam(s) or CISS piles would isolate construction activities, including pouring of concrete, from the waterway. Therefore, construction-related impacts on turbidity and suspension of sediments would be limited to the actual installation and removal of the temporary cofferdam(s) or CISS piles, with removal more likely to suspend sediments than installation. Removal of the existing bridge support structures in and adjacent to the river channel would have similar effects on sediment suspension. Their removal would allow water to pass through those locations.

Construction of a temporary earthen fill access road down the west bank and across the river to the east bank would place sediments within the river channel that could be eroded by river flows during the work period, when the road is present. If any flow is present or becomes present during the work, portions of the fill could be washed downstream. Driving equipment across that flow would suspend sediments and have the potential to wash pollutants off the equipment into the water. The source of earthen material used and duration that the road is in place would determine the potential for and type of sediments that could be suspended and carried downstream with effects as described below.

Diversion of flow away from specific work areas, such as bank excavation or support structure construction, would have the potential to result in temporary suspension of sediment as the diversion is put in place and then when it is removed. Operation of the diversion could also cause sediment suspension if adequate energy dissipation is not included at the discharge location.

Sediments suspended during low-flow periods would primarily be sand and silt that would rapidly settle before reaching occupied Santa Ana sucker habitat. Sediments suspended by construction activities during higher flows would add a small increment to the suspended sediment load caused by the higher velocity water that would not adversely affect occupied habitat downstream. Construction of the cofferdam(s) or CISS piles would normally be limited to the period between April and September, and is expected to take approximately four weeks, when river flows are relatively low, resulting in little to no transport of fine sediment downstream to occupied habitat.

Leaks of fuel, hydraulic fluid, and/or lubricants from equipment working in or above the river channel, although unlikely, have a potential to contaminate dry or moist river bed sediments when no flow is present. This contamination, if not cleaned up immediately, could be transported downstream during higher flow events to occupied Santa Ana sucker habitat. Leaks into flowing water would be transported downstream and could reach occupied habitat.

5.2 Operations

The new bridge supports are not anticipated to alter sediment and water transport downstream. Each would be the same width as the existing piers but approximately 20 feet longer (parallel to flow). The river channel under the new bridge would be widened, particularly on the north side, so that the five new piers

would be in the channel. Hydraulic modeling shows that, relative to the existing bridge, the new bridge would result in a slightly lower water surface elevation and velocity during a 100-year flow event (HDR 2012). Thus, the new bridge would not impede water transport under the bridge. The new bridge would not change water surface elevation downstream of the bridge and thus would not affect water or sediment transport downstream.

The new armoring along the reconfigured west bank would add a small amount of turbidity to river flows during initial runoff events after construction is completed that wash fines on the rock surfaces off into the river and/or when higher flows contact the new rock and wash off the fine sediments adhering to the rock surface. The input of sediment would be temporary and would add a negligible amount to the existing sediment load during such runoff events with no adverse effects on occupied habitat downstream.

Operation of the trains at an average of 25 round trips per day would have the potential to contribute small amounts of pollutants, such as lubricants and fine metal/plastic particles from normal wear of moving parts (e.g., wheels and brakes) under the train, to the river through dry fallout or rainfall runoff from the train/bridge. These could add to pollutants downstream in occupied habitat during runoff events that transport water and sediments downstream. The quantities of these pollutants are expected to be small, particularly if the trains are regularly maintained and cleaned. Maintenance activities for the track and bridge also have the potential to introduce pollutants into the river in a similar manner.

6 Recommended Protection Measures

The following measures are recommended to minimize the potential for effects of the project on Santa Ana sucker critical habitat and downstream occupied habitat.

1. Provide environmental training for all construction workers that discuses the Santa Ana sucker, its critical habitat, and protection of habitat and water quality.
2. Include in the SWPPP measures for immediate cleanup of spilled or leaked pollutants within the river channel, energy dissipation for diversion outflows, and monitoring/maintenance of BMPs during construction.
3. Place culverts under temporary access road fill sized to pass maximum anticipated low flows in the river, and remove temporary access road fill (and culverts) prior to any expected higher river flows that could wash out that road.
4. Monitor during construction activities in the river channel to ensure that pollutants are not introduced into the river sediments or water.
5. Maintain and clean rail cars to minimize the amount of lubricants and metal/plastic particles from normal wear that could fall into the river channel as the trains cross the bridge.
6. Provide environmental training to bridge/rail maintenance personnel that includes BMPs to use to prevent pollutants from entering the river.

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APPENDIX K

San Bernardino Kangaroo Rat Report

San Bernardino Kangaroo Rat (*Dipodomys merriami parvus*) Habitat Assessment & Focused Survey Report for the Redlands Passenger Rail Project at the Santa Ana River Crossing

Located within an unsectioned portion of T1S, R4W, San Bernardino Base and Meridian, U.S. Geological Survey – San Bernardino South Quadrangle, City of San Bernardino, San Bernardino County, California

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Certification: I hereby certify that the statements furnished herein, and in the attached exhibits present data and information required for this Biological Survey to the best of my ability, and the facts, statements, and information presented are true and correct to the best of my knowledge and belief. This report was prepared in accordance with professional requirements and recommended protocols issued in (USFWS permit No. TE-094308-0)

Shay Lawrey, Ecologist/Regulatory Specialist

August, 2012

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1 Executive Summary

The San Bernardino County Associated Governments (SANBAG) proposes to construct the Redlands Passenger Rail Project (Project) which consists of rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino, at E Street and the University of Redlands in the eastern portion of the City of Redlands. Project construction includes demolition and replacement of the existing track, installation of new continuously welded rail on concrete ties and new ballast and sub-ballast sections throughout the rail corridor, and replacement or retrofitting of bridge crossings. Construction of the proposed Project would begin in 2015 and would proceed generally from the west of E Street to the SAR and similarly from the SAR east to Cook Street.

One bridge crossing to be replaced is the bridge structure at the Santa Ana River. A steel beam bridge will be constructed in replacement of the existing structure. Construction access/staging would occur from the north end of the western bank. If flow is present during construction, a temporary diversion of water may be required. The diversion may consist of a temporary bypass using a pipe, flume, excavated channel, or alternative method that temporarily reroutes water around the construction area. Work zone isolation at the SAR may be required through the installation of a cofferdam and/or construction work pads within the wet area.

The existing bridge and bridge piers would be removed prior to installation of new bridge piers and the proposed design would accommodate Santa River Trail Phase III along the western bank. A debris containment system will be installed under the bridge to catch any falling debris from the demolition activities. Construction at the SAR may involve limited dredging of material from the channel bed and/or excavation along the adjacent banks. These activities could also include the placement of fill including concrete and riprap. The new bridge will be up to 365 feet in length and will result in approximately 3.61 acres of temporary disturbance to the Santa Ana River channel bed/banks.

For this project HDR Engineering, Inc. (HDR) prepared a biological constraints analysis in October 2010. Based on that analysis, HDR determined that potentially suitable habitat for the San Bernardino kangaroo rat (*Dipodomys merriami parvus*) [SBKR] exists in the Project area. In 2012, HDR contracted Tom Dodson & Associates (TDA) to conduct a focused SBKR habitat assessment of the alignment and conduct follow-on trapping surveys if required. On May 8, 2012, TDA Biologist, Shay Lawrey conducted a habitat suitability assessment for SBKR along the entire alignment. Ms. Lawrey found that the area surrounding the SAR bridge crossing was the only area along the alignment suitable for SBKR. Since this area warranted follow-on surveys, Ms. Lawrey conducted a focused trapping survey between May 18 and May 23, 2012.

No SBKR were trapped over the course of the 5-night protocol survey. Therefore, SBKR are considered absent from the site. Due to the absence of SBKR on site, there is no risk of impacting SBKR directly by implementing this project. However, the project site is mapped within critical habitat (CH) designated by the U.S. Fish and Wildlife Service (USFWS) for SBKR. This project has a federal nexus via permitting and funding, therefore project-related impacts to CH must be addressed through formal consultation with the USFWS.

2 Location and Setting

The SBKR study area is located at the existing SAR rail road bridge crossing, north of Interstate 10 (I-10) freeway and Carnegie Drive, east of Waterman Avenue, south and southeast of Orange Show Road, and west of Tippecanoe Avenue in the City of San Bernardino, California (Figures 1-4). The study area can also be found on the U.S. Geological Survey (USGS) – San Bernardino South quadrangle, 7.5 Minute Series topographic map within an unsectioned portion of Township 1 South and Range 4 West.

The local area climate is semi-arid, with an average annual temperature of 67°F and a range from 25-110°F. The rainy season begins in November and continues through March, with the quantity and frequency of rain varying from year to year. The average annual rainfall is approximately 18.1 inches. The general vicinity of the subject property consists of open space, vacant land, Eucalyptus groves, and commercial uses.

3 Methods

3.1 Research

A literature review was also conducted to examine data gathered from various biological surveys previously conducted in the vicinity of the Project area. The literature review included a review of standard field guides and texts on sensitive and non-sensitive biological resources, as well as the following sources:

- *Natural Environmental Study (NES) prepared for the SART Phase III Project by Tom Dodson & Associates for the County of San Bernardino Regional Parks Department;*
- *San Bernardino Kangaroo Rat (Dipodomys merriami parvus)Presence/Absence Trapping Studies San Bernardino International Airport South Drainage Channel, San Bernardino, California prepared by Natural Resources Assessment, Inc., May 2012.*
- *Presence/Absence Trapping Studies for the San Bernardino Kangaroo Rat Santa Ana River Trails Phase III Tippecanoe Avenue to Orange Show Road City of San Bernardino, San Bernardino County, California Prepared by ENVIRA, March 2011.*
- *General Biological Assessment & Focused Survey Report for the Mountain View Avenue Extension & Widening Project prepared by Tom Dodson & Associates, 2008.*

3.2 SBKR Habitat Assessment

On May 8, 2012 TDA biologist, Shay Lawrey walked the alignment to visually assess the site conditions. During the site walk over, Ms. Lawrey looked for burrows, tail drags, tracks, and scat indicative of kangaroo rats. She also looked at the soil type and level of friability as well as habitat type and habitat structure.

3.3 SBKR Trapping Survey

Ms. Lawrey has a decade of experience with SBKR and is a biologist permitted (USFWS permit number TE 094308-0) by the USFWS to trap and handle SBKR. Ms. Lawrey conducted the focused live-trapping surveys between May 18 and May 23, 2012 according to protocols established for the SBKR. The protocol calls for five consecutive nights of trapping, when the animal is active above ground at night.

During the trapping session, a total of 100 traps (five trap lines consisting of 20 traps) were set. The trap lines consisted of 12-inch, Sherman live traps placed 10 meter apart. Traps were placed in suitable habitat areas, concentrating on locating traps in areas containing sandy soils, relatively free of debris and containing suitable vegetation. Areas with kangaroo rat/small mammal sign (scat, burrows, tail drags) were also targeted. Each trap was baited with a mixture of bird seed and rolled oats placed at the back of the traps. The traps were set at dusk each night and inspected once during the night and at dawn each morning. All animals were identified and released unharmed at the point of capture. Daily notes included weather conditions such as temperature, wind speed, cloud cover, precipitation and moon phase. Site characteristics such as soils, topography, the condition of the plant communities, and evidence of human use of the site were also noted.

4 Results

4.1 Research

Despite its location in the middle of a dense urban area, the SAR floodplain maintains considerable habitat value. In addition to the fundamental flood control and water-related functions of the SAR, this watercourse serves as a wildlife habitat linkage, corridor, and buffer in an urban context, linking habitats that are separated by development and providing wildlife dispersal and migration pathways. The floodplain also buffers plants and wildlife from surrounding human disturbance. For these and other reasons the habitats in SAR floodplain, and by default the SBKR study area, support a high level of natural resource diversity and richness. Table 1 below provides a list of sensitive species with a potential to occur in the vicinity of the SAR bridge crossing and information as to the presence of suitable habitat and/or CH.

Table 1: Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the Project Area at the SAR.

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
Plants					
bristly sedge	*Carex comosa*	CNPS 2.1	Marshes and swamps.	A	Grows along lake margins and wet places which are absent.
California bedstraw	*Galium californicum ssp. primum*	CNPS 1B	Chaparral, lower montane coniferous forest.	A	Grows in shade of trees and shrubs at the lower edge of the pine belt, in pine forest-chaparral ecotone.
California satintail	*Imperata brevifolia*	CNPS 2.1	Coastal scrub, chaparral, riparian scrub, mojavean scrub, meadows and seeps (alkali).	HP	Marginal habitat present. Species not found during survey.

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
Gambel's water cress	*Nasturtium gambelii*	FE/ST	Marshes and swamps.	A	Found in freshwater and brackish marshes at the margins of lakes and along streams, in or just above the water level.
Horn's milk-vetch	*Astragalus hornii var. hornii*	CNPS1B	Meadows and seeps, playas.	A	Grows along lake margins, alkaline sites which are absent.
Los Angeles sunflower	*Helianthus nuttallii ssp. parishii*	CNPS 1A	Marshes and swamps (coastal salt and freshwater). Historical from southern California.	A	Marsh/swamp habitat is not present.
marsh sandwort	*Arenaria paludicola*	FE/SE/ CNPS1B	Marshes and swamps.	A	No dense mats of typha, juncus, scirpus, etc. and no freshwater marsh.
mesa horkelia	*Horkelia cuneata ssp. puberula*	CNPS 1B	Chaparral, cismontane woodland, coastal scrub.	HP	Suitable habitat present but this species is not documented in the local vicinity of the Project and was not found during survey.
Nevin's barberry	*Berberis nevinii*	FE/SE	Chaparral, cismontane woodland, coastal scrub, riparian scrub.	A	Preferred steep, north-facing slopes are absent from site.
Parish's gooseberry	*Ribes divaricatum var. parishii*	CNPS 1A	Riparian woodland.	HP	Suitable habitat present. Species not observed during survey.
Parish's desert-thorn	*Lycium parishii*	CNPS 2.3	Coastal scrub, sonoran desert scrub.	HP	Suitable habitat present. Species not observed during survey.
Parish's bush-mallow	*Malacothamnus parishii*	CNPS 1A	Chaparral, coastal sage scrub.	HP	Suitable habitat present. Species not observed during survey.
Parry's spineflower	*Chorizanthe parryi var. parryi*	CNPS 1B	Coastal scrub, chaparral.	HP	Suitable habitat present. Species not observed during survey.
Plummer's mariposa-lily	*Calochortus plummerae*	CNPS 1B	Coastal scrub, chaparral, grassland, lower montane coniferous forest.	HP	Suitable habitat present. Species not observed during survey.
Pringle's monardella	*Monardella pringlei*	CNPS 1A	Coastal scrub.	HP	Suitable habitat present. Species not observed during

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
					survey.
Robinson's pepper-grass	*Lepidium virginicum var. robinsonii*	CNPS 1B	Chaparral, coastal scrub.	HP	Suitable habitat present. Species not observed during survey.
Salt Spring checkerbloom	*Sidalcea neomexicana*	CNPS 2.2	Alkali playas, brackish marshes, chaparral, coastal scrub, lower montane forest.	A	Species requires alkali springs and marshes which are absent from site.
salt marsh bird's-beak	*Cordylanthus maritimus ssp. maritimus*	FE/SE	Coastal salt marsh, coastal dunes.	A	Limited to the higher zones of the salt marsh habitat
San Bernardino aster	*Symphyotrichum defoliatum*	CNPS 1B	Meadows and seeps, marshes and swamps, coastal scrub, cismontane woodland, lower montane coniferous forest, grassland.	A	Requires vernally mesic grassland, ditches, streams and springs. Species not observed during SBKR survey or HDR focused plant surveys.
Santa Ana River woollystar	*Eriastrum densifolium ssp. sanctorum*	FE/SE	Coastal scrub, chaparral.	HP	Suitable habitat present. Species was observed approx. 150 meters outside of the Project boundaries.
slender-horned spineflower	*Dodecahema leptoceras*	FE/SE	Chaparral, coastal scrub (alluvial fan sage scrub).	HP	Suitable habitat present. Species documented in local vicinity, but not observed within study area during focused survey.
smooth tarplant	*Centromadia pungens ssp. laevis*	CNPS 1B	Valley and foothill grassland, chenopod scrub, meadows, playas, riparian woodland.	A	Grows in alkali meadow, alkali scrub which is absent.

Fish

arroyo chub	*Gila orcuttii*	SSC	Los Angeles basin south coastal streams.	A	Project abuts dry sandy river habitat. This species occurs in slow water stream sections with mud or sand bottoms.
Santa Ana sucker	*Catostomus santaanae*	FT	Endemic to Los Angeles basin south coastal streams.	A/ CH	Nearest location is d/s of La Cadena at the Rialto Drain. CH in Project alignment

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
Santa Ana speckled dace	*Rhinichthys osculus ssp. 3*	SSC	Headwaters of the Santa Ana and San Gabriel rivers. May be extirpated from the Los Angeles river system.	A	Requires permanent flowing streams with summer water temps of 17-20 c.

Reptiles & Amphibians

coast (San Diego) horned lizard	*Phrynosoma coronatum (blainvillii population)*	SSC	Inhabits coastal sage scrub and chaparral in arid and semi-arid climate conditions	HP	Species observed in vicinity.
northern red-diamond rattlesnake	*Crotalus ruber ruber*	SSC	Chaparral, woodland, grassland, & desert areas from coastal San Diego County to the eastern slopes of the mountains.	A	Occurs in rocky areas & dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.
orange-throated whiptail	*Aspidoscelis hyperythra*	SSC	Inhabits low-elevation coastal scrub, chaparral, and valley-foothill hardwood habitats.	HP	Prefers washes & other sandy areas with patches of brush & rocks. Species not observed during general biological surveys, but note that focused herpetological surveys were not conducted.
Sierra Madre yellow-legged frog	*Rana muscosa*	FE	Federal listing refers to populations in the San Gabriel, San Jacinto & San Bernardino mountains only.	A	Always encountered within a few feet of water.
silvery legless lizard	*Anniella pulchra pulchra*	SSC	Sandy or loose loamy soils under sparse vegetation.	A	Soil moisture is essential. They prefer soils with a high moisture content. Soils on site are dry.

Birds

burrowing owl	*Athene cunicularia*	SSC	Open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation.	HP	Suitable habitat present adjacent to trail alignment between Orange Show Road and California Street. Species or evidence

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
					such as feathers, castings , white wash or burrows were not observed during any of the field work including focused surveys conducted by HDR
coastal California gnatcatcher	*Polioptila californica californica*	FT	Obligate, permanent resident of coastal sage scrub below 2500 ft in southern California.	A	Species not observed in local vicinity for over 10 years. RAFSS is not the preferred habitat of this species.
least Bell's vireo	*Vireo bellii pusillus*	FE/SE	Summer resident of southern California in riparian habitat in vicinity of water or in dry river bottoms; below 2000 ft.	P	Observed during survey.
loggerhead shrike	*Lanius ludovicianus*	SSC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, & riparian woodlands, desert oases, scrub & washes.	P	Suitable habitat present and species observed.
southwestern willow flycatcher	*Empidonax traillii extimus*	FE/SE	Riparian woodlands in southern California.	P/CH	Portions of the Project are mapped within CH. Species is observed in Project area near Waterman Avenue.
yellow-breasted chat	*Icteria virens*	SSC	Summer resident; inhabits riparian thickets of willow & other brushy tangles near watercourses.	HP	Suitable habitat present. Species observed in local vicinity.
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	FC/SE	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	A	Nests in riparian jungles of willow. Habitat is not suitable for this species.
yellow warbler	*Dendroica petechia brewsteri*	SSC	Riparian plant associations. Prefers willows, cottonwoods, aspens, sycamores, & alders for nesting & foraging.	HP	Suitable habitat present. Species not seen during survey, but note focused avian surveys were not conducted.

Mammals

American badger	*Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous	HP	Suitable habitat present and species documented in vicinity.

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
			habitats, with friable soils.		
Los Angeles pocket mouse	*Perognathus longimembris brevinasus*	SSC	Lower elevation grasslands & coastal sage communities in and around the los Angeles basin.	P	Suitable habitat present and species documented in vicinity. Species not observed during survey.
northwestern San Diego pocket mouse	*Chaetodipus fallax fallax*	SSC	Coastal scrub, chaparral, grasslands, sagebrush, etc. In western San Diego co.	P	Suitable habitat present. Species observed in vicinity and found during survey.
pallid bat	*Antrozous pallidus*	SSC	Deserts, grasslands, shrublands, woodlands & forests. Most common in open, dry habitats with rocky areas for roosting.	A	No suitable roosting sites.
pocketed free-tailed bat	*Nyctinomops femorosaccus*	SSC	Variety of arid areas in southern California; pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert riparian	A.	Species found in rocky areas with high cliffs
San Bernardino kangaroo rat	*Dipodomys merriami parvus*	FE	Alluvial scrub vegetation on sandy loam substrates characteristic of alluvial fans and flood plains.	P/CH	Project area mapped within CH. Species was observed during survey and is documented in Project area.
Stephens' kangaroo rat	*Dipodomys stephensi*	FE/ST	Primarily annual & perennial grasslands, but also occurs in coastal scrub & sagebrush with sparse canopy cover.	A	Out of species range.
San Diego black-tailed jackrabbit	*Lepus californicus bennettii*	SSC	Open shrub / herbaceous & tree / herbaceous edges.	HP	Suitable habitat present. Species not observed during survey.
San Diego desert woodrat	*Neotoma lepida intermedia*	SSC	Coastal scrub of southern California from San Diego county to San Luis Obispo county.	P	Suitable habitat present. Species documented in vicinity and observed during survey.
southern grasshopper mouse	*Onychomys torridus ramona*	SSC	Desert areas, especially scrub habitats with friable soils for digging.	HP	Suitable habitat present. Species observed in vicinity.

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
			Prefers low to moderate shrub cover.		
western mastiff bat	*Eumops perotis californicus*	SSC	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral etc.	A	No suitable habitat on site. Roosts in crevices in cliff faces, high buildings, & tunnels.
western yellow bat	*Lasiurus xanthinus*	SSC	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats.	HP	Suitable habitat present.

Insects

Delhi Sands flower-loving fly	*Rhaphiomidas terminatus abdominalis*	FE	Found only in areas of the Delhi sands formation in southwestern San Bernardino & northwestern Riverside counties.	A	Requires fine, sandy soils, often with wholly or partly consolidated dunes & sparse vegetation.

Coding of Terms: 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 CH unit, but does not necessarily mean that appropriate habitat is present.

Status: Federal Endangered (FE); Federal Threatened (FT); Federal Proposed (FP, FPE, FPT); Federal Candidate (FC), Federal Species of Concern (FSC); State Endangered (SE); State Threatened (ST); Fully Protected (FP); State Rare (SR); State Species of Special Concern (SSC); California Native Plant Society (CNPS) 1A- presumed extinct in California, 1B - Rare, Threatened or Endangered in California and elsewhere, 2 - Rare, Threatened or Endangered in California but more common elsewhere, 3 - Plants for which more information is needed, 4 - Plants with a limited distribution.

Of the species listed in the table above, four (4) sensitive small mammal species have a high potential for presence in the vicinity of the trapping survey area including the SBKR, San Diego pocket mouse, Los Angeles pocket mouse, and San Diego desert woodrat. Specific species background information for these four small mammals is provided for reference below. Please note that only the SBKR requires specific survey protocols to establish presence or absence. These specific survey protocols are required for areas where impacts may occur to the sensitive species or their occupied habitat. The remaining species are usually identified through casual observation while trapping for targeted species.

SBKR - The SBKR is one of several kangaroo rat species in its range. The Dulzura (*Dipodomys simulans*), the Pacific kangaroo rat (*Dipodomys agilis*) and the Stephens kangaroo rat (*Dipodomys stephensi*) occur in areas occupied by the San Bernardino kangaroo rat, but these other species have a wider habitat range. The habitat of the San Bernardino kangaroo rat is described as being confined to primary and secondary alluvial fan scrub habitats, with sandy soils deposited by fluvial (water) rather than aeolian (wind) processes. Burrows are dug in loose soil, usually near or beneath shrubs. The SBKR is one of three subspecies of the Merriam's kangaroo rat. The Merriam's

kangaroo rat is a widespread species that can be found from the inland valleys to the deserts. The subspecies known as the San Bernardino kangaroo rat, however, is confined to inland valley scrub communities, and more particularly, to scrub communities occurring along rivers, streams and drainage. Most of these drainages have been historically altered as a result of flood control efforts and the resulting increased use of river resources, including mining, off-road vehicle use and road and housing development. This increased use of river floodplain resources has resulted in a reduction in both the amount and quality of habitat available for the San Bernardino kangaroo rat. The past habitat losses and potential future losses prompted the emergency listing of the San Bernardino kangaroo rat as an endangered species (U.S. Fish and Wildlife Service, 1998a). Robust populations of SBKR are documented approximately 1 mile upstream of the study area. According to recent surveys conducted in the vicinity of the Project, SBKR have recently (2010 and 2012) been located approximately 0.25 mile upstream of the SAR crossing.

Northwestern San Diego Pocket Mouse - The northwestern San Diego pocket mouse prefers habitat similar to that preferred by the SBKR. The northwestern San Diego pocket mouse occurs in open, sandy areas in the valleys and foothills of southwestern California. The range of this species extends from Orange County to San Diego County, and includes Riverside and San Bernardino counties. This mouse is a California Species of Special Concern (CSC) whose historical range has been reduced by urban development and agriculture. CSC designation of species is based on a series of publications prepared by the CDFG on declining species of mammals, birds, fishes, and amphibians and reptiles. The publications were intended to focus attention on declining wildlife in California, species that are not currently listed but may merit listing under the California Endangered Species Act (CESA). Some of the species identified in these documents have been subsequently listed, or are provided protection under provisions in the California Endangered Species Act (CEQA). Others have remained on the CSC list, and have not been elevated to a greater status of protection. The reasons are many, including a lack of understanding on the specific numbers of individuals and populations, the habitats occupied by the species, and the threats to those habitats.

Los Angeles Pocket Mouse -The Los Angeles (LA) pocket mouse is one of two pocket mice found in this area of San Bernardino County. Both the Los Angeles pocket mouse and the San Diego pocket mouse occupy similar habitats, but the San Diego pocket mouse has a wider range extending south into San Diego County. The habitat of the Los Angeles pocket mouse is described as being confined to lower elevation grasslands and coast sage scrub habitats, in areas with soils composed of fine sands (Williams, 1986). The present known distribution of this species extends from Rancho Cucamonga east to Morongo Valley and south to the San Diego County border. LA pocket mouse forages in open ground and underneath shrubs. Pocket mice in general dig burrows in loose soil, although this has not been completely documented for this subspecies. The LA pocket mouse is listed as a California Species of Special Concern by the California Department of Fish and Game (CDFG).

San Diego Desert Woodrat -The desert woodrat is a relatively wide-ranging species extending along the coast of California from south of San Francisco through to the border with Baja California. This species also occurs in the Central Valley and the deserts of southern California and extends along the desert side of the Sierra Nevada into southeastern Oregon. The coastal race of the desert woodrat, the San Diego desert

woodrat, prefers scrub habitats such as coastal sage scrub, chaparral and alluvial fan sage scrub. It is more common in areas with rock piles and coarse sandy to rocky soils throughout coastal southern California. The range of this species extends from just south of Sacramento and the San Francisco area to the border with Baja California. The coastal subspecies of the widespread *Neotoma lepida* is listed as a CSC; its historical range has been impacted by the conversion of scrub habitats into residential, commercial and industrial use.

4.2 SBKR Habitat Assessment

After visually assessing the entire alignment and researching background information relative to SBKR occurrences, Ms. Lawrey determined that the only location in the Project alignment supporting suitable habitat for SBKR occurs at the existing SAR rail road bridge crossing. The soils here are very friable and consist of Psamments and fluvents (young alluvial deposits with little or no soil formation) and Soboba Stony Loamy sand. The type and structure of the habitat here are also consistent with SBKR occupation. Current surveys have been positive for SBKR 0.25 mile upstream of the existing SAR rail road bridge crossing between Orange Show Road and Tippecanoe Avenue. The rest of the Project alignment did not display any habitat characteristics or diagnostic sign indicative of potential SBKR occupation, nor did the records indicate SBKR presence. Therefore, the SBKR analysis area became focused at the existing SAR rail road bridge crossing.

4.2.1 Observed Habitats

Riversidean Alluvial Fan Sage Scrub RAFSS - Expansive blocks of RAFSS habitat exist within the Santa Ana River. RAFSS is a rare and sensitive plant community that is adapted to the harsh conditions of flooding. It grows on sandy, rocky alluvium deposited by streams that experience infrequent episodes of flooding. The dominant habitat type found within the SBKR study area includes RAFSS (Holland community code 32720). RAFSS is a Mediterranean shrubland community that dominates washes, floodplains, and alluvial fans in southern California. Because alluvial fan sage scrub is characterized by its diversity, it can also be described as an intermediate between chaparral and sage scrub habitats, in that all three vegetation communities share similar floral components. However, the distinguishing factor is that alluvial fan sage scrub undergoes periodic scouring from frequent flooding events, creating three seral stages; pioneer, intermediate, and mature.

The SBKR study area contains disturbed intermediate RAFSS. This habitat generally occurs between the active flood channels and terraces of the Santa Ana River and is subjected to infrequent flooding events. Species composition onsite includes scalebroom (*Lepidospartum squamatum*), California buckwheat, brittlebush, matchweed (*Gutierrezia californica*), broom matchweed (*Gutierrezia sarothrae*), telegraph weed (*Heterotheca grandiflora*), coastal goldenbush (*Isocoma menziesii*), interior goldenbush (*Ericameria linearifolia*), hairy yerba santa (*Eriodictyon trichocalyx*), California sagebrush (*Artemisia californica*), Coastal prickly pear (*Opuntia littoralis*), valley cholla (*Opuntia parryi*), shrubby butterweed (*Senecio flaccidus*), and Our Lord's candle (*Yucca whipplei*). Soils are mainly gravelly, coarse alluvium with approximately 50 percent vegetative cover.

California Buckwheat Alluvial Fan Association - The California Buckwheat Alluvial Fan Association (CBAFA) described by Gordon and White (1994) is a type of RAFSS in which California buckwheat is dominant. It is another alluvial scrub found adjacent to major floodplains and is found in the SBKR survey area. Species present onsite typical of this community included California buckwheat as a dominant species, as well as brittlebush, California matchweed, deerweed, and occasional hairy yerba santa and scalebroom. Vegetative cover is moderate and soils are characterized as loose, coarse alluvia. In the SBKR study area, this community is primarily associated with previously disturbed areas up on the upper terraces adjacent to the bridge abuttments.

Ruderal - Ruderal, non-native vegetation has successfully colonized the outskirts of the SBKR study area. Non-native cover is very high. Typical vegetation observed onsite consists of weedy non-native species such as wild oat (*Avena* sp.), shortpod mustard (*Hirschfeldia incana*), ripgut grass (*Bromus diandrus*), foxtail chess (*Bromus madritensis* ssp. *rubens*), tocalote (*Centaurea melitensis*), red-stemmed filaree (*Erodium cicutarium*), and horehound (*Marrubium vulgare*).

Riparian - In addition to the rich RAFSS habitat community found within the SBKR study area, patches of riparian habitat occur along the banks. This riparian habitat is in various seral stages and generally consists of tall, multilayered, open canopy riparian woodland. The characteristic vegetative species within this riparian habitat include; Fremont cottonwood (*Populus fremontii),* black willow (*Salix goodingii*), sandbar willow (*S. hindsiana*), and mule fat (*Baccharis salicifolia*). This riparian woodland has emerged with a complex canopy structure of varying layers of trees, shrubs, herbs and vines. The overstory within Mission Creek and at its confluence with the SAR averages over 35 ft in height.

The habitat within the study area is favorable for foraging, nesting, burrowing, and wildlife movement.

4.2.2 Commonly Observed Plants and Wildlife

Common native perennial floral species present in the SBKR study areas include chamise, California juniper, California buckwheat, deerweed, white sage, and California sagebrush. Common native annual species include wreath plant (*Stephanomeria virgata* ssp. *virgata*), slender buckwheat (*Eriogonum gracile*), California sun cup (*Camissonia bistorta*), California croton (*Croton californicus*), telegraph weed, and prickly cryptantha (*Cryptantha muricata*).

Common wildlife species seen and/or heard during the SBKR surveys include a number of local reptiles, birds, and mammals. Common reptiles encountered were the coastal western whiptail (*cnemidophorus tigris*), western fence lizard (*Sceloporus occidentalis*), and side-blotch lizard (*Uta stansburiana*). Approximately 15 bird species were detected. Common birds included black phoebe (*Sayornis nigricans*), northern mockingbird (*Mimus polyglottos*), rock wren (*Salpinctes obsoletus*), and western kingbird (*Tyrannus verticalis*). Excluding the small mammals captured during trapping, three mammals species were seen including the California ground squirrel (*Spermophilus beecheyi*), desert cottontail (*Sylvilagus audobonii*), and coyote (*Canis latrans*).

4.3 SBKR Trapping Surveys

Based on the suitable site conditions at the existing SAR rail road bridge crossing and known locations of SBKR in the nearby vicinity, it was determined that trapping studies were warranted. No limitations or constraints were identified that could influence the survey results. Surveys were conducted during the appropriate season, in good weather conditions, by a qualified biologist who followed all pertinent protocols. Weather conditions were clear and cool with calm winds. Table 2 below shows the tabulated weather data as it relates to the surveys.

Table 2. Survey dates, weather conditions, and moon phases

Survey Dates	%Cloud Cover	Wind (BFT)	Overnight Low Temp (°F)	Precipitation	Moon Phase
05/18	50	2	57	None	Waxing cresant
05/19	50	2	58	None	Waxing cresant
05/20	20	2	57	None	New moon
05/21	10	1	60	None	Waning cresent
05/22	0	2	63	None	Waning cresent
05/23	0	1	60	None	Waning cresent

Sign of various small mammals were observed within the areas of the trap lines and five (5) native rodent species were trapped in the SBKR survey area. No animals were marked as part of this survey so determining unique individuals versus recaptured individuals was not possible. The term “trap night” is used to relay how many individuals, per species were caught over the 5-night session. Each trap is counted as a trap night, so with 100 traps surveyed over five nights there was a total of 500 trap nights in the survey area. There were 143 captures over the five night trapping period.

Table 3. Species captured within the Phase 1 SBKR Survey Area

Species	Trap Nights
Dulzura Kangaroo Rat *(Dipodomys simulans)*	5
desert wood rat (*Neotoma lepida*)	10
cactus mouse (*Peromyscus eremicus*)	25
deer mouse (*Peromyscus maniculatus*)	75
San Diego pocket mouse (*Chaetodipus fallax fallax*)	28

(Phylogenetic listing per Jameson & Peters, California Mammals, 1988)

5 Conclusions

The trapping results show that SBKR do not currently occupy this area of the SAR. No SBKR were trapped over the course of the 5-night trapping survey. Given the absence of SBKR within the analysis area, there is no risk of taking individuals of this species in conjunction with implementing the proposed project. Although the project will not likely result in the loss of a federally listed species it may affect critical habitat. This project has a federal nexus, via permitting and funding, therefore project-related impacts to CH must be addressed through formal consultation with the USFWS.

5.1 San Bernardino Kangaroo Rat Critical Habitat

The USFWS is the principal Federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants and their habitats by enforcing Federal wildlife laws, administering the ESA, managing migratory bird populations, restoring nationally significant fisheries, and conserving wildlife habitat. The USFWS listed the SBKR as endangered on September 24, 1998 (63 FR 51005) and designated CH for this species on April 23, 2002 (67 FR 19812). On January 10, 2011 the Court rejected the USFWS's 2008 revised SBKR CH designation (FR 73, No. 202). As a result of this decision, this project is subject to the SBKR CH that was designated by the USFWS in 2002 (67 FR 19812).

The 2002 CH designation for the SBKR encompasses 33,295 acres of land in Riverside and San Bernardino counties, California. CH is defined in section 3(5)(A)(i) of the ESA, in part, as "*areas occupied by the species at the time of listing and containing those physical and biological features (Primary Constituent Elements (PCEs)) that are essential to the conservation of the species, and that may require special management considerations or protection. General requirements include, but are not limited to: space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species*".

The areas designated as CH for SBKR are identified in four separate units. The four units are within the geographical range of the SBKR and support the habitat the species requires for foraging, sheltering, reproduction, rearing of young, dispersal, and genetic exchange. This project falls within the Santa Ana River CH Unit (Unit 1), located in San Bernardino County. Unit 1 encompasses approximately 8,935 ac, and includes the SAR and portions of City, Plunge, and Mill Creeks. It is bounded by Seven Oaks Dam to the northeast. Although Seven Oaks Dam impedes sediment transport and reduces the magnitude, frequency, and extent of flood events, the system still retains partial fluvial dynamics because contributions from Mill Creek and other tributaries are not impeded by a dam or debris basin. This unit contains upland refugia and tributaries that are occupied by the species, active hydrological channels, floodplain terraces, and areas of habitat immediately adjacent to floodplain terraces. The functions and values of the SBKR CH within Unit 1 include: (1) Soil series consisting predominantly of sand, loamy sand, sandy loam, or loam; (2) Alluvial fan sage scrub and associated vegetation, such as coastal sage scrub and chamise chaparral, with a moderately open canopy; (3) River, creek, stream, and wash channels; alluvial fans; floodplains; floodplain benches and terraces; and historic braided channels that are subject to dynamic geomorphological and hydrological processes typical of fluvial systems within the historical range of the San Bernardino kangaroo rat; and (4) Upland areas proximal to floodplains with suitable habitat.

The Project area at the SAR is mapped within Unit 1 of designated SBKR CH. The CH within this portion of the Project area, specifically within the SAR between Waterman

Avenue and Orange Show Road, contains some PCEs for SBKR, is marginally suitable for SBKR and provides connectivity to large blocks of occupied habitat.

The new bridge will be up to 365 feet in length and will result in approximately 1.45 acres of impact including 0.84 acres of temporary disturbance and 0.61 acres of permanent disturbance to SAR channel bed/banks within SBKR CH. Temporary impacts to 0.84 acres and permanent impacts to 0.61 acres of the 8,935 acres of CH designated within Unit 1 will not result in an adverse modification of the CH designated in this unit. Furthermore, this Project will not change the hydrologic processes in any way that will contribute to further loss of PCEs elements identified for SBKR within the SAR.

5.2 Jurisdictional Waters & Regulatory Issues

The SAR is a jurisdictional river system characterized by active meander zones (within man-made levees) with quickly changing sedimentation and accretion patterns and a broad natural floodplain that frequently floods in the winter and spring. Construction of the Project may result in temporary and permanent alteration and fill of jurisdictional waters. Impacts to jurisdictional waters usually require regulatory approvals from the one or more of the following regulatory agencies: U.S. Army Corps of Engineers (Corps), Regional Water Quality Control Board (RWQCB), and/or CDFG.

Based on the projected impacts gathered from current documentation, the Project may require a Clean Water Act (CWA) Section 404 permit, CWA Section 401 Certification, and CDFG Code Section 1602 Streambed Alteration Agreement. Further, critical habitat (CH) has also been designated over parts of the Project area for the federally listed SWWF and Santa Ana sucker as well as SBKR. Below is a discussion the regulations and corresponding regulatory agency for which this project may need to consult.

Clean Water Act (CWA)- The CWA is the principal federal law that governs pollution in the nation's lakes, rivers, and coastal waters. Originally enacted in 1972 as a series of amendments to the Federal Water Pollution Control Act of 1948, the Act was last amended in 1987. The overriding purpose of the CWA is to "restore and maintain the chemical, physical and biological integrity of the nation's waters." The statute employs a variety of regulatory and non-regulatory tools to eliminate the discharge of pollutants into the nation's waters and achieve water quality that is both "swimmable and fishable".

Under Section 404 of the CWA, the Corps has primary federal responsibility for administering regulations that concern the discharge of dredged or fill material into waters of the U.S. (including wetlands). Waters of the U.S. (WoUS) are defined as: "*All waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters"* (Section 404 of the CWA; 33 CFR 328).

The limit of the Corps jurisdiction for non-tidal waters (including non-tidal perennial and intermittent watercourses and tributaries to such watercourses) in the absence of

adjacent wetlands is defined by the ordinary high water mark. The ordinary high water mark (OHWM) is defined as: "*The 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* (Section 404 of the CWA; 33 CFR 328). Wetlands are defined as: *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 saturated soil conditions"* (Section 404 of the CWA; 33 CFR 328).

Porter-Cologne Water Quality Control Act (Porter-Cologne)- Porter-Cologne is the principal State law that governs water protection efforts in California. Porter-Cologne establishes the State Water Resources Control Board (SWRCB) and each of the nine RWQCBs as the principal state agencies for coordinating and controlling water quality in California. The RWQCB typically regulates discharges of dredged or fill material into WoUS pursuant to Section 401 of the CWA, however, they also have regulatory authority over waste discharges into Waters of the State, which may be isolated, under Porter-Cologne. In the absence of a nexus with the Corps, the RWQCB requires the submittal of a Waste Discharge Requirement (WDR) application, which must include a copy of the project Storm Water Pollution Prevention Plan (SWPPP) and a copy of the project Water Quality Management Plan (WQMP), otherwise called a Standard Urban Stormwater Management Plan (SUSMP). The RWQCB's role is to ensure that disturbances in the stream channel do not cause water quality degradation.

California Fish and Game Code (FGC) - Sections 1600 to 1616 of the California FGC require any person, state, or local government agency or public utility to notify the CDFG before beginning any activity that will substantially modify a river, stream, or lake. If it is determined that the activity could substantially adversely impact an existing fish and wildlife resource, then a Lake or Streambed Alteration Agreement is required.

Like the Corps and RWQCB, the CDFG also regulates discharges of dredged or fill material. The regulatory jurisdiction of CDFG is much broader however, than Corps or RWQCB jurisdictions. CDFG regulates **all** activities that substantially alter streams and lakes and their associated habitats. The CDFG, through provisions of the FGC Sections 1601-1603 is empowered to issue agreements for any substantial alteration of a river, stream, or lake where fish or wildlife resources may be adversely affected. Streams (and rivers) are defined by the presence of a channel bed and banks. The CDFG typically extends the limits of their jurisdiction laterally beyond the channel banks for streams that support riparian vegetation. In these situations the outer edge of the riparian vegetation is generally used as the lateral extent of the stream and CDFG jurisdiction. CDFG regulates wetland areas only to the extent that those wetlands are a part of a river, stream, or lake as defined by CDFG.

California Endangered Species Act (CESA) - The CDFG administers the California Endangered Species Act (CESA). The State of California considers an endangered species one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management, and a rare species is one present in such small numbers

throughout its range that it may become endangered if its present environment worsens. “Rare species” classification applies to California native plants. The State definition of “take” is narrow and specifically refers to the direct loss of a State-listed species.

Provisions within the FGC protect all native birds of prey and their nests (FGC §3503.5), and all non-game birds (other than those not listed as Fully Protected) that occur naturally in the State (§38oo). The handful of species, such as the California condor, that are designated by the State as “fully protected” received this rare designation through special legislation. There is no mechanism allowed for CDFG to issue take authorization for a fully protected species. Species of Special Concern is an informal designation used by CDFG for some declining wildlife species that are not proposed for listing as threatened or endangered, such as the burrowing owl. This designation does not provide legal protection, but signifies that these species are recognized as sensitive by CDFG.

Federal Endangered Species Act (ESA) - Special status species are native species that have been afforded special legal protection because of concern for their continued existence. The USFWS enforces the provisions of the federal ESA. Section 9 of the ESA prohibits the "taking" of a listed species by anyone, including private individuals, and state and local agencies. The term "take" under federal law means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. "Take" can include adverse modification of habitats used by a threatened or endangered species during any portion of its life history. Threatened and endangered species on the federal list (50 CFR Sections 17.11 and 17.12) are protected from indirect and/or direct or take. If "take" of a listed species is necessary to complete an otherwise lawful activity, this triggers the need for consultation under Section 7 or Section 10 of ESA. A Biological Opinion with incidental take provisions would be rendered. Pursuant to the requirements of the ESA, a federal agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present in the study area and whether the proposed project will have a potentially significant impact upon such species.

Under the ESA habitat loss may be considered an impact to the species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species that is proposed for listing under ESA or to result in the destruction or adverse modification of CH proposed to be designated for such species. The term "critical habitat" for a threatened or endangered species refers to the following: specific areas within the geographical range of the species at the time it is listed that contain suitable habitat for the species, which may require special management considerations or protection; and specific areas outside the geographical range of the species at the time it is listed that contain suitable habitat for the species and is determined to be essential for the conservation of the species. Under Section 7 of the ESA, all federal agencies (including USFWS) are required to ensure that any action they authorize, fund, or carry out will not likely jeopardize the continued existence of a listed species or adversely modify their CH.

Pursuant to CEQA, project-related impacts to these species, or their habitats, would be considered significant and require mitigation.

Migratory Bird Treaty Act- Migratory birds are protected under the federal Migratory Bird

Treaty Act (MBTA) of 1918 (16 U.S.C 703-711). The MBTA provides protection for nesting birds that are both residents and migrants whether or not they are considered sensitive by resource agencies. The MBTA prohibits take of nearly all native birds. The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment or forced fledging would be considered take under federal law. The USFWS, in coordination with the CDFG administers the MBTA. CDFG's authoritative nexus to MBTA is provided in FGC Sections 3503.5 which protects all birds of prey and their nests and FGC Section 3800 which protects all non-game birds that occur naturally in the State.

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Figures

Figure 1. Aerial Overview of SBKR Survey Area

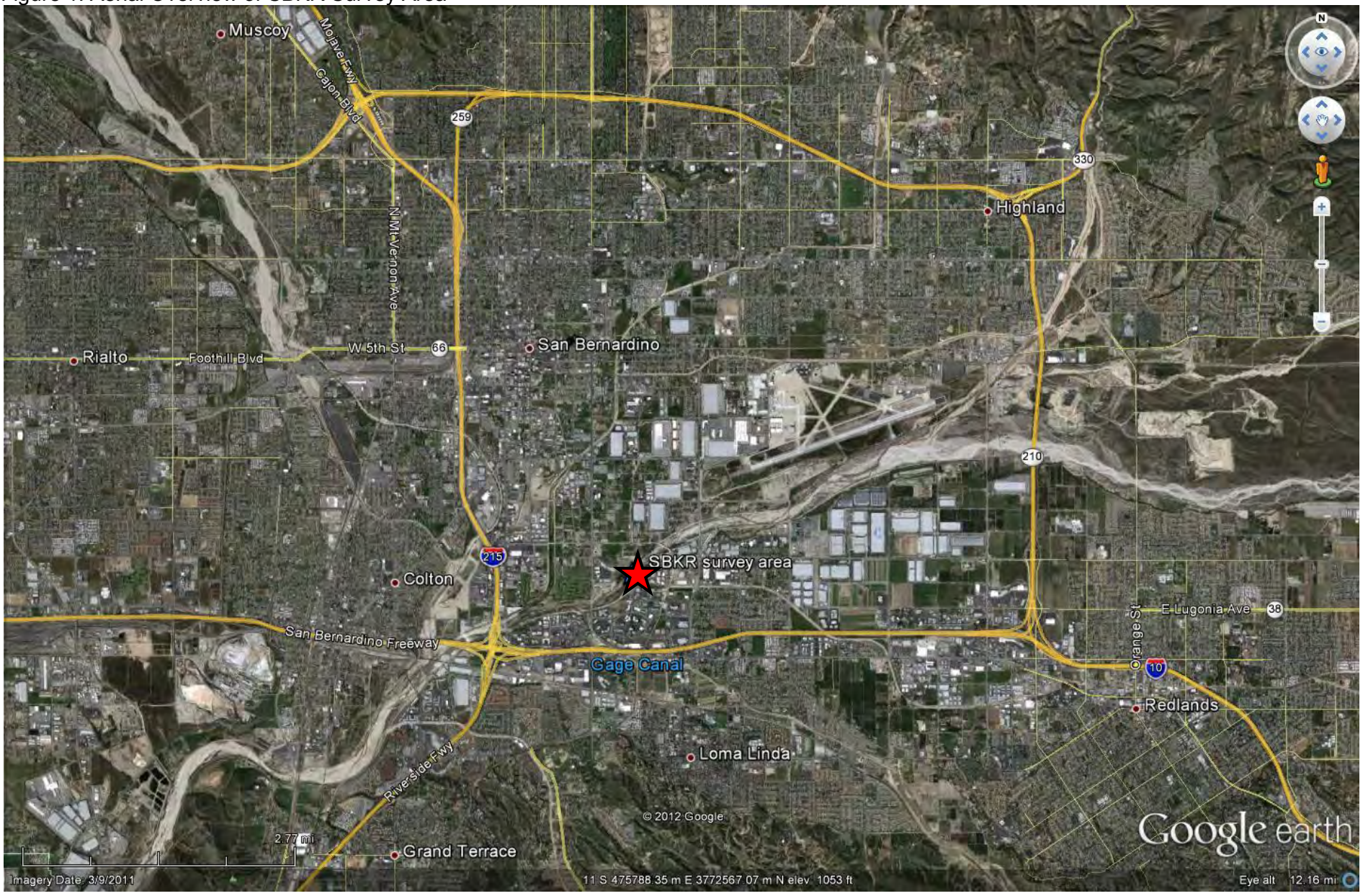

Figure 2. Aerial View of SBKR Survey Area with Critical Habitat Overlay

Figure 3. Aerial View of SBKR Survey Area Site Location

Photos of SBKR Survey Area

Photo 1. Standing on west side of bridge looking north/northeast.

Photo 2. Standing on east side of bridge looking north/northwest.

Photo 3. Standing on north side of SAR as rail road approaches abutment looking southeast.

Photo 4. Standing at Mission Creek confluence with the SAR looking northeast at SAR bridge crossing.

APPENDIX L

Jurisdictional Delineation Report

Revised Final Jurisdictional Wetland Delineation Report

Redlands Passenger Rail Project

Redlands, San Bernardino County, California

July 2013

Prepared for:

San Bernardino Associated Governments
1170 W. 3rd Street, 2nd Floor
San Bernardino, California 92410

Prepared by:

HDR Engineering, Inc.
8690 Balboa Avenue, Suite 200
San Diego, California 92123

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1.0 INTRODUCTION AND PROJECT DESCRIPTION

This report summarizes preliminary findings of the U.S. Army Corps of Engineers (USACE) and California Department of Fish and Wildlife (CDFW) jurisdiction for the Redlands Passenger Rail Project (RPRP or project) located in Redlands, San Bernardino County, California. [1] In 2012, HDR biologists examined the project site and a surrounding buffer area to determine the limits of: (1) USACE jurisdiction pursuant to Section 404 of the Clean Water Act (CWA); and (2) CDFW jurisdiction pursuant to Section 1600 of the California Fish and Game Code. Appendix A, Figure 1 depicts the project location. Appendix A, Figure 2 depicts the project study area overlaid on USGS San Bernardino South and Redlands quadrangles. Appendix A, Figure 3 depicts soils within the project study area. Appendix A - Figures 4a-4t, depict the vegetation communities and cover types that occur within the project study area. Appendix A - Figures 5a-5t depict the location and extent of Waters of the U.S. and Waters of the State.

Should project construction result in measurable impacts to USACE or CDFW jurisdiction, one or more of the following permitting documents may be required, depending on jurisdictional determinations (JD) made by the regulatory authorities identified by this study:

- A USACE Individual Permit pursuant to Section 404 of the federal CWA (1990, as amended), and/or qualification under a Nationwide Permit pursuant to Section 404 of the CWA;
- CWA Section 401 Certification from the state Regional Water Quality Control Board (RWQCB); and
- California Fish and Game Code Section 1602 Streambed alteration Agreement (CDFW).

1.1 PROJECT APPLICANT

The San Bernardino Associated Governments (SANBAG) is proposing the Project as further described under Section 1.2 to facilitate passenger rail service along the Redlands Corridor. SANBAG would be the project applicant for any regulatory permit approvals that may be required for the Project. The primary contact person at SANBAG for the Project is provided below.

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1.2 PROJECT DESCRIPTION

The Project would involve the implementation rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. Appendix A, Figure 1 depicts the project location. The five station stops proposed in conjunction with the RPRP would be located at E Street and Tippecanoe Avenue within the City of San Bernardino and New York Street, Orange Street, and University Street within the City of Redlands.

[1] This report presents our best effort at estimating the subject jurisdictional boundaries using the most up-to-date regulations and written policy and guidance from the regulatory agencies. Only the regulatory agencies can make a final determination of jurisdictional boundaries. If a final jurisdictional determination is required, HDR can assist in getting written confirmation of jurisdictional boundaries from the agencies.

Maintenance activities would be performed at a new layover facility proposed west of California Street and south of I-10 in the City of Redlands, just north of the Loma Linda city limits.

Construction of the project would occur within an existing railroad right-of-way (ROW) owned by the San Bernardino Associated Governments (SANBAG). SANBAG's ROW averages 50 to 100 feet in width with the exception of portions of downtown Redlands where the ROW measures less than 40 feet. Additional details regarding each of the components comprising the Project and associated operations are described under the following subheadings.

Track Improvements

The Project would include the construction of track improvements to facilitate train movements along a single track through the rail corridor with an approximately 10,000-foot-long section of passing track or siding, from just west of Richardson Street to just east of California Street (Mile Post [MP] 5.5 to MP 7.4). The proposed track ballast and sub-grade along the 9-mile project corridor would be constructed to 50 feet in width, sufficient to support a parallel maintenance road. In downtown Redlands, this width would be reduced to less than 40 feet in recognition of the constrained ROW. This would require demolition and replacement of the existing track. These improvements would generally adhere to standards established by the BNSF and Southern California Regional Railroad Authority (SCRRA) for the rail, rail ties, ballast and subballast materials, grade crossing panels, placement of drainage structures and retaining walls, and horizontal and vertical clearances. The rail improvements would also include the construction of a new train signaling and communications system.

Structural Crossings and Bridges

The Project would require the replacement or retrofitting of up to six structural crossings to facilitate the loading requirements of the passenger trains and track foundation. Five of the six structural crossings consist of existing bridge structures at Warm Creek (Historic), Twin Creek, Santa Ana River (Upper), the Mission Zanja Flood Control Channel, and Mill Creek Zanja.

Roadway Grade Crossings

The Study Area traverses 32 existing roadway grade crossings including two I-10 underpasses. Roadways grade crossing not subject to closure would be re-designed in accordance with the latest Grade Crossing Design guidelines that require in certain cases raised medians, widened sidewalks, traffic striping, flashing lights, pedestrian gate arms where requested by the California Public Utilities Commission (CPUC), and swing gates.

Proposed Rail Platforms

There are currently five (5) station stops proposed for the Project with new rail platforms proposed at four (4) locations. Two (2) station stops (E Street and Tippecanoe Avenue) would be located in the City of San Bernardino, while the other three (3) (New York Street, Downtown Redlands, and the University of Redlands) would be located in the City of Redlands. Shade structures (or canopies) would be provided to individually distinguish each rail platform and to compliment the contextual surroundings. Landscape planters would be used to separate platforms from open areas, adjacent uses, and walkways.

Train Layover Facility

The Project would require the development of a new Train Layover Facility to include sufficient storage tracks for maintenance activities and operational activities including offices, training rooms, and a crew break room. The Train Layover Facility would be constructed on a long narrow site immediately south of I-10 and west of California Street and would contain up to seven spur tracks.

Utility Replacement and Relocation

The Project would likely necessitate the relocation of existing subsurface and overhead crossing utilities (i.e., water, sewer, storm drain, power, gas, fiber optic, and telephone lines) in accordance with applicable utility accommodation design criteria and engineering standards. The exact method of improvement, if required, would be determined in coordination with the affected utility provider in conjunction with the Project's final design.

Drainage

Several drainage facility improvements would be necessary to accommodate the track improvements, bridge replacements, platform improvements, and layover facility. It is anticipated that a majority of the storm drain facilities would be protected in place and would not need to be lowered to meet minimum depth requirements. However, it is likely that the majority of the storm drain casings within the rail ROW would need to be extended to span the entire width of the rail ROW. These improvements would be coordinated with the cities of San Bernardino and Redlands along with San Bernardino County Flood Control District (SBCFCD). In addition, longitudinal storm drain lines located within the rail corridor would need to be relocated further from the proposed track centerlines to comply with BNSF engineering standards.

Mission Zanja Channel Improvements. Mission Zanja Flood Control Channel runs parallel to the rail line from the SAR to approximately 900 feet west of California Street for a distance of approximately 2.6 miles where it diverges from the Survey Area to the south. At approximately milepost 9.4 (Bridge 9.4), the creek rejoins the railroad further east, as Mill Creek Zanja , where it passes under the railroad just west of the I-10 overcrossing.

Mission Zanja Channel is characterized as an improved, trapezoidal earthen channel with some segments including wire revetment (USACE, 1994). To ensure the structural integrity of the track improvements along sections of Mission Zanja Channel, the Project may include bank stabilization improvements (e.g. armoring, slope keying, etc.) to the northern bank of the Mission Zanja Channel, from MP 3.5 to just east of MP 6, to ensure that the bank is able to support the additional loading requirements and withstand scour during high flow events. At this time, SANBAG is considering the use of an articulated concrete block (ACB) to support the armoring of the northern bank, which would allow for the growth of limited vegetation. This improvement would be coordinated and constructed with the SBCFCD, which owns and maintains the Mission Zanja Channel.

Description of Passenger Rail Operations

The Project would incorporate the use of previously owned rail commuter rail vehicles and would start operations in early 2018. Local service would operate between the E Street and University of Redlands Rail Platforms with stops at each of the station stops along the route. Trains would operate every 30 minutes in the peak periods and every hour in the off-peak period. This would translate to 25 average

daily round trips along the alignment during weekdays. The Project does not propose any corresponding increase is freight service.

Maintenance

Maintenance of the railroad ROW is currently the responsibility of BNSF, which is the current operator of the rail line. This includes routine maintenance of the track and track ties, grade crossings, and communication system. Vegetation management and weed abatement would also be required along the ROW. Each platform would also require routine landscaping and facility maintenance (e.g. replacement of lighting fixtures). Typical railroad maintenance and inspections would be conducted by a contractor hired by SANBAG throughout the operational phase of the Project in accordance with SCRRA/Metrolink and BNSF standard practices.

Construction

Construction of the proposed Project would begin in 2015 and take up to 36 months to complete. Construction would proceed generally from the west of E Street to the SAR and similarly from the SAR east to Cook Street. Construction scheduling and phasing would ultimately be at the discretion of SANBAG's contractor. In total, the anticipated construction disturbance area is estimated at 140.59 acres; however, actual physical disturbance would generally be limited to 10 acres or less on any given day. Of this total disturbance area, approximately 34.35 acres would be limited to temporary, construction-related impacts associated with the bridge structures and staging areas, while approximately 106.24 acres would be permanently impacted by the placement of one or more Project facilities.

A description of anticipated construction activities over the course of Project construction is provided as follows:

- Construction easement acquisition, clearing and grubbing, and removal of existing track;
- Relocate, extend, or encase utilities, as appropriate, to remove conflicts;
- Construct embankments, culvert extensions, an retaining walls for the proposed rail corridor, as necessary;
- Re-grade, install drainage, and construct bridge crossings, including as appropriate, new, standard height parapets on both sides of each bridge, construct in-fill walls, plug deck drains, construct new spread footings at each pile, and seal parapet joints;
- Construct new rail platforms at proposed rail platform locations and layover facility; and
- Construct new continuous welded rail track, roadway grade crossings, and install pedestrian access improvements and landscaping, where appropriate.

These activities would likely overlap at times. Staging areas for construction equipment and materials would be located primarily within the SANBAG ROW to the extent feasible. Other staging areas would be acquired, as necessary, by the construction contractor and, to the extent feasible, would include vacated roadway ROW. The location of the staging areas would depend on the rail segment, bridge, and platform location being constructed. In addition, a part of the proposed layover facility would be used as a centralized construction staging area for heavy equipment due to its centralized location along the rail corridor.

1.2.1 Alternatives and Design Options

In conjunction with the environmental review for RPRP, SANBAG is considering several alternatives and design options for the project. The alternatives and design options evaluated in this BTR are identified and summarized below:

- *Reduced Project Footprint Alternative*. This alternative would involve a reduced construction area (130.6 acres) to minimize impacts to sensitive habitats. These reductions in the construction area occur at Twin Creek, the SAR, and along the Mission Zanja Flood Control Channel. Additionally, this alternative would include an alternate bridge design for Bridge 3.4 to further minimize permanent impacts to the SAR as a result of the placement of the new bridge pier foundations. All other aspects of this alternative would be similar to the Preferred Project.
- *Design Option 1 (Layover at Waterman Avenue)*. Design Option 1 would entail the placement of the proposed layover facility at an alternative location, just east of Waterman Avenue and north of the railroad corridor. The total construction area under the design option would slightly increase to 143.6 acres. All other aspects of this design option would be similar to the Preferred Project.
- *Design Options 2 (Use of Existing Layover Facilities)*. Design Option 2 would entail the use of existing layover facilities to the west of the Survey Area in place of constructing a new layover facility. The total construction area under the design option would decrease to 130.0 acres. All other aspects of this design option would be similar to the Preferred Project.
- *Design Option 3 (Waterman Station)*. Design Option 3 would entail the construction of a new station platform just east of Waterman Avenue and south of the railroad corridor in place of the Tippecanoe Avenue platform. The total construction area under the design option would slightly increase to 139.5 acres. All other aspects of this design option would be similar to the Preferred Project.

Additionally, a No Build Alternative is under consideration as part of the environmental review. Under this alternative, SANBAG would not construction the project, but would still be required to perform regularly scheduled maintenance of the existing track and corresponding improvements at grade crossings and bridges to facilitate continued freight service per SANBAG's obligations with BNSF. As a result, the some renovation and rehabilitation of the railroad corridor would still be required. However, these improvements would not be performed immediately, but rather incrementally over the next 10 years.

1.2.2 Definitions

The following definitions are used to describe the location of the various survey activities conducted during on-site fieldwork:

- ***Project area*** is defined as the limits of impacts associated with full build-out of the proposed project. The proposed project footprint is approximately 143 acres.
- ***Survey area*** is defined as the area within 200 feet on either side of the centerline of the proposed track alignment that was mapped and evaluated for potential direct and indirect impacts to biological resources. In limited areas, the survey area extends beyond the 200-foot offset to cover adjacent project facilities or potential infrastructure improvements. The survey area for the project is approximately 534 acres.

1.3 PROJECT LOCATION

The project is located within the limits of the Cities of San Bernardino and Redlands within the County of San Bernardino, California (Figure 1). The Survey area includes the easternmost nine miles of the 10-mile long Redlands Subdivision, which is now under SANBAG ownership. The Survey area starts just west of Mile Post (MP) 1, east of E Street within the City of San Bernardino and ends at MP 10.1 at the University of Redlands. The western endpoint of the Survey area roughly corresponds with 472625.405003 meters (m) East and 3773265.404 m North (WGS 84 UTM 11N). The eastern end of the Survey area corresponds with 485190.263559 m East and 3768624.11534 m North (WGS 84 UTM 11N).

Five major water crossings occur along within the Survey area. The western-most water crossing occurs at Warm Creek (Historic) at approximately MP 1.1. Further east, the railroad corridor crosses Twin Creek at approximately MP 2.2. At MP 3.4, the railroad corridor crosses the Santa Ana River. East of the Santa Ana River, the Survey area parallels the Mission Zanja Flood Control Channel for approximately 2.6 miles (MP 3.4 to MP 6.0). At MP 5.78, the Bryn Mawr Avenue crosses the Mission Zanja Flood Control Channel and intersections with the railroad corridor. Further east, the railroad corridor crosses the Mill Creek Zanja at MP 9.4.

1.4 SOILS

The Survey area is characterized as an alluvium-filled valley that formed over crystalline bedrock. The resulting surface generally ranges from 1,078 feet mean sea level (msl) in downtown San Bernardino to 1,474 feet msl in downtown Redlands. Soils within the Survey area boundary were mapped using the Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2003). The proposed project crosses eight different soil types (Appendix A, Figure 3), including:

- ***Grangeville Fine Sandy Loam (Gr)*** – This nearly level soil occurs on alluvial fans and alluvial plains and is used for pasture, truck crops, tomatoes, and flowers. It is a poorly drained, very deep fine sandy loam derived from granitic alluvium. The available water holding capacity is 6 to 8.5 inches. Runoff is very slow, and the erosion hazard is slight. The elevation ranges from 50 to 200 feet.
- ***Tujunga Gravelly Loamy Sand (TvC), 0-9 percent slopes*** – This soil occurs on alluvial fans and flood plains and is used mainly for grazing. Tujunga series consists of very deep, somewhat excessively drained soils formed in alluvium weathered mostly from granitic sources. The soils formed in sandy alluvium derived mostly from granitic sources. Runoff is very low or negligible and permeability is rapid. The elevation ranges from 5 to 4,300 feet.
- ***Hanford Coarse Sandy Loam (HaC), 2-9 percent slopes*** – This soil occurs on stream bottoms, floodplains and alluvial fans and is used for growing a wide range of fruits, vegetables, and general farm crops. Hanford series consists of very deep, well drained soils that formed in moderately coarse textured alluvium dominantly from granite. Runoff is well drained or low and permeability is moderately rapid. The elevation ranges from 150 to 3,500 feet.
- ***Psamments and Fluvents, Frequently Flooded (Ps)*** – Psamment soils are sandy in all layers and are among the most productive rangeland soils. Psamments are used mostly as rangeland, pasture, or wildlife habitat. Fluvents are more the more or less freely drained Entisols that have formed in recent water-deposited sediments on flood plains, fans, and deltas along rivers and small streams. Fluvents are used as rangeland, forest, pasture, or wildlife habitat and sometimes used as cropland. Most fluvents are frequently flooded with normal stratification of materials unless they are protected by dams or levees.

- ***Tujunga Loamy Sand (TvB), 0-5 percent slope –*** This soil occurs in somewhat excessively drained soils formed in alluvium and is used for growing citrus, grapes and other fruits but mainly used for grazing. Tujunga series consists of mostly weathered granitic sources. Runoff is very low to negligible with rapid permeability. The elevation ranges from 5-4,300 feet.
- ***Grangeville Fine Sandy Loam, Saline-Alkali (Gs) –*** This nearly level soil occurs on alluvial fans and alluvial plains and is used for pasture, truck crops, tomatoes, and flowers. It is a poorly drained, very deep fine sandy loam derived from granitic alluvium. The available water holding capacity is 6 to 8.5 inches. Formerly, most areas of Grangeville soils were occasionally flooded. Runoff is negligible, with moderate permeability in saline-sodic phases. The elevation ranges from 50 to 200 feet.
- ***Hanford Sandy Loam (HbA), 0-2 percent slopes –*** This soil occurs on stream bottoms, floodplains and alluvial fans and is used mostly for growing a wide range of fruits, vegetables, and general farm crops. Hanford series consists of mostly granite and other quartz bearing rocks. Runoff is well drained, negligible to low runoff, and with moderately rapid permeability. The elevation ranges from 150-3,500 feet.
- ***Ramona Sandy Loam (RmC), 2-9 percent slopes –*** This soil occurs on terraces and fans and used mostly for production of grain, irrigated citrus and deciduous fruits. Ramona series consists of mostly granitic and related rock sources. Runoff is slow to rapid and permeability is moderately slow. The elevation ranges from 250-3,500 feet.

1.5 HYDROLOGY

The Study Area is located within the Santa Ana River Watershed[2], which is approximately 2,800 square miles in area, originates at San Gorgonio Peak in San Bernardino County and drains southwesterly through Riverside and Orange Counties prior to emptying into the Pacific Ocean at Newport Beach. The Study Area is located with the Upper Santa Ana River Watershed, which is hydraulically disconnected from the lower watershed by San Prado Dam. The Study Area corresponds with the Santa Ana River Wash (HUC 18070203507), Mission Zanja (HUC 180702030506), and the Warm Creek (HUC 180702030508) sub-watershed units.

A total of five major offsite drainage features either crosses or is located longitudinally to the rail corridor. The crossings from west to east are known as Warm Creek (Historic) [Bridge 1.1], Twin Creek [Bridge 2.2], the SAR [Bridge 3.4], Bryn Mawr Avenue [Bridge 5.78], and Mill Creek Zanja [Bridge 9.4]. Bridges 5.78 and 9.4 cross the Mission Zanja Flood Control Channel (Mission Zanja Channel), which is a major drainage channel located adjacent and to the south of the eastern segment of the rail corridor.

1.6 VEGETATION COMMUNITIES

Vegetation types or plant communities are assemblages of plant species that usually coexist in the same area. The classification of vegetation communities is based upon the life form of the dominant species within that community and the associated flora. Vegetation was classified using the R.F. Holland system of natural communities as described in Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986). Nomenclature follows Hickman (1993) and Roberts, et al. (2004). The survey area supports 14 distinct vegetation communities (Appendix A - Figures 4a-4t; Table 1); however, the predominant land cover was identified as being urban/developed. The majority of the survey area is

[2] Note the SAR Watershed is located within the South Coast Hydrologic Region and corresponds to Hydrologic Unit Code (HUC) 18070203 accordingly to the U.S. Geological Survey.

made up of paved roadways, man-made structures, adjacent lands that are un-vegetated, and landscaped parcels.

Disturbed Habitat (Holland Code 11300)

Disturbed habitat (DH) is primarily used to identify areas of severe impacts to natural communities to the extent where it is no longer sustaining or functioning naturally. These areas have been previously physically disturbed, but continue to retain a soil substrate. Disturbed areas consist of predominantly non-native weedy and ruderal exotic species. This is not a natural community and generally does not provide habitat for wildlife or sensitive species. Examples of disturbed habitat include areas that have been graded, cleared areas for fuel management, staging areas, off-road vehicle trails, and abandoned home sites.

Disturbed habitat in the survey corridor consists of abandoned staging areas, home sites, and parking areas, unpaved roads, and areas that have been graded, repeatedly cleared, and/or experienced repeated use that prevents natural revegetation (Appendix A, Figure 4a-4tAppendix B, Photograph 1). Characteristic species include invasive, non-native forbes, such as, prickly Russian-thistle/tumbleweed (*Salsola tragus*), London rocket (*Sisymbrium irio*), fennel (*Foeniculum vulgare*). In addition a limited amount of annual grasses typical of non-native grassland (42200) occur but do not dominate DH.

Table 1. Existing Vegetation within the Project Survey Area

Vegetation Communities	Survey Area Acreage
Disturbed Habitat	24.54
Disturbed Wetland	0.02
Eucalyptus Woodland	2.78
Flat-top Buckwheat Scrub (disturbed)	0.91
Mulefat Scrub	0.04
Non-Jurisdictional Ditch	1.31
Non-Native Grassland	61.90
Non-Vegetated Channel	29.22
Oak Woodland	9.62
Orchard and Vineyards	5.28
Southern Cottonwood Willow Riparian Forest	8.27
Southern Willow Scrub	0.64
Tamarisk Scrub	0.47
Urban/Developed	388.88
Total	533.88

Disturbed Wetland (Holland Code 11200)

Disturbed Wetland (DW) is generally associated with areas of wetlands that have been disturbed in the past by clearing, grubbing, or mowing. The vegetation community has indicators of wetland species that

have been disturbed and non-native species such as castor bean (*Ricinus communis*), giant reed grass (*Arundo donax*), pampas grass (*Cortaderia selloana*), and other invasive species.

Within the survey area, a small area of DW occurs along the northern portion of the streambed in Twin Creek just west of the existing railroad bridge. Vegetation is sparse and consists of young arroyo willows (*Salix lasiolepis*), mulefat (*Baccharis salicifolia*), Typha (*Typha* sp.), and water speedwell (*Veronica anagallis-aquatica*). Within the DW a significant amount of trash and debris has accumulated such as mattresses, clothing, and shopping carts (Appendix A, Figure 4d; Appendix B, Photographs 2 and 3). There is evidence of vegetation maintenance (i.e., mowing) within the streambed. The DW does not connect upstream or downstream to wetland habitats.

Eucalyptus Woodland (Holland Code 11100)

Eucalyptus woodland (EW) is characterized by landscaped areas around homes or roadways. The primary indicator in EW is eucalyptus (*Eucalyptus* spp.), which is a non-native tree species from Australia. The understory is sparse and mostly dominated by leaf litter and weedy species including brome grasses.

Within the survey area, EW occurs adjacent to the Santa Ana River with individuals and smaller stands of Eucalyptus occurring throughout the project alignment (Appendix A, Figures 4a-4t; Appendix B, Photograph 4).

Flat-top Buckwheat Scrub (Holland Code 37K00)

Flat-top buckwheat scrub (FBS) consists of a monoculture of successional vegetation that formally supported coastal sage scrub and chaparral in areas that experience continued disturbances. In the survey corridor this community is disturbed, however, it is dominated by flat-top buckwheat (*Eriogonum fasciculatum*) and Wright's buckwheat (*Eriogonum wrightii)*, with the presence of other species. Other species that were present include annual brome grasses, fescue (*Vulpia* spp.), filaree (*Erodium* spp.), deerweed (*Lotus scoparius*), white sage (*Salvia apiana*), and ranchers fiddleneck (*Amsinckia menziesii* var. *intermedia*).

Within the survey area, FBS occurs within a vacant lot located north of the railroad tracks adjacent to Warm Creek and east of D Street (Appendix A, Figures 4a-4t). This habitat is disturbed due to frequent mowing.

Mule fat Scrub (Holland Code 63310)

Mule fat scrub (MFS) is generally characterized by tall, herbaceous riparian scrub dominated by mule fat. This vegetation community is frequently flooded an absence of floods in this community would likely succeed to cottonwood- or sycamore-dominated riparian forest or woodlands. Within the survey area this habitat occurs primarily within the Santa Ana River (Appendix A, Figures 4a-4t).

Non-native Grassland (Holland Code 42200)

Non-native grasslands (NNG) are often associated with numerous species of wildflowers and a dense to sparse cover of annual grasses. Characteristic plant species of NNG include oat (*Avena* sp.), rip gut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), foxtail brome *(Bromus madritensis* ssp. *rubens),* four-spot clarkia *(Clarkia purpurea),* sierra shooting star (*Dodecatheon clevelandii*), and California melica (*Melica californica*).

NNG within the survey area is often disturbed and appears to have been previously irrigated and/or cultivated for agricultural purposes. Characteristics that comprise this attribute include the occurrence of previously open space between rows and these areas appear to be currently maintained (Appendix A, Figures 4a-4t).

Proposed Non-jurisdictional Ditch (No Holland Code)

Several non-jurisdictional ditches occur within the survey area. These ditches occur entirely within upland areas and are generally associated with the railroad ROW. These features are typically unvegetated, or vegetated with weedy ruderal species, and do not provide significant wildlife habitat. These features serve to drain road runoff from the ROW and are often connected through a series of culverts running parallel with the ROW (Appendix A, Figures 4a-4t).

Non-Vegetated Channel (Holland Code 13200)

Non-Vegetated Channel (NVC) consists primarily of engineered/leveed channels maintained by the San Bernardino Flood Control District or local municipality. The channels are either concrete-lined or consist of a fine to coarse sandy or sandy cobbly substrate and are sparsely vegetated or unvegetated. Leveed banks consist of either concrete, concrete-covered cobble, or rock rip rap. Within the survey area, FCC occurs primarily in Twin Creek, Warm Creek, the Santa Ana River, Zanja/Mission channel (Appendix A, Figures 4a-4t; Appendix B, Photographs 3 and 5).

Oak Woodland (Holland Code 71100)

Oak woodland (OW) consists primarily of monotypic stands or various species of oak (*Quercus* sp.) with a poorly developed shrub layer, and well developed herbaceous layer generally dominated by grasses (*Bromes* spp.).

In the survey area this vegetation community consists of uniformly distributed scrub oak species with an occasional live oak (*Quercus* spp.) and a disturbed understory made up of non-native grasses that appear to be maintained (Appendix A, Figures 4a-4t). The area provides little habitat value due to the amount of disturbance and the surrounding land uses.

Orchard and Vineyards (Holland Code 18100)

Orchard and Vineyards (OV) occurs as an active orange grove located north of the ROW between California and Nevada Streets (Appendix A, Figures 4a-4t).

Southern Cottonwood Willow Riparian Forest (Holland Code 61330)

Tall, open, broadleafed winter-deciduous riparian forests dominated by Fremont cottonwood (*Populus fremontii)* and several willow species (*Salix* spp). This habitat occurs in sub-irrigated and frequently overflowed lands along rivers and streams. The dominant species require moist, bare mineral soil for germination and establishment. The understory is generally vegetated by herbaceous and viney species such as sedges (*Carex* sp.), grape (*Vitis* sp.), and introduced wetland species.

Within the survey area, Southern cottonwood willow riparian forest (SCWRF) occurs primarily within the western portion of Mission Zanja Channel and within the Santa Ana River (Appendix A, Figures 4a-4t).

Southern Willow Scrub (Holland Code 63320)

Southern willow scrub (SWS) is usually made up of a dense thicket of various willow species (*Salix* spp.). This habitat occurs in loose, sandy alluvium near stream channels and is frequently flooded. The habitat is limited by the dense thicket of willows and frequent flooding which impacts the development of an understory.

Within the survey area, SWS occurs as small patches within the Santa Ana River and Twin Creek (Appendix A, Figures 4a-4t; Appendix B, Photographs 6-8).

Tamarisk Scrub (Holland Code 63810)

Tamarisk scrub (TS) is made up of almost a monoculture of any of several tamarisk (*Tamarix* spp.) species. This vegetation community is often associated with major disturbances in areas where native vegetation is being supplemented by tamarisk.

Within the survey area Tamarisk Scrub occurs in primarily within the Santa Ana River and the Zanja/Mission Channel (Appendix A, Figures 4h).

Urban/Developed (Holland Code 12000)

Urban/Developed (UD) land is comprised of areas of intensive use with much of the land constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. Developed land is highly modified and characterized by permanent or semi-permanent structures, pavement, unvegetated areas and landscaped areas that require irrigation.

Within the survey corridor, developed areas are comprised of paved roadways, man-made structures, adjacent lands that are unvegetated, or landscapes with a variety of ornamental (typically non-native/ exotic) plants (Appendix A, Figures 4a-4t; Appendix B, Photographs 9 and 10).

2.0 METHODS

Jurisdictional delineation surveys were conducted for the proposed project in 2012. The survey area was delineated by HDR Biologists Sean Harris and Allegra Simmons on February 7-8, and 22-23, 2012. As previously described, the survey area extends 200 feet from the project centerline to capture jurisdictional features within and adjacent to the proposed project footprint. HDR biologists examined the project area to determine the limits of: (1) USACE jurisdiction pursuant to Section 404 of the Clean Water Act (CWA); and (2) California Department of Fish and Wildlife (CDFW) jurisdiction pursuant to Section 1600-1616 of the California Fish and Game Code. The site was evaluated in accordance with the 1987 USACE Wetland Delineation Manual (Environmental Laboratory, 1987), the 1992 Classification of Wetlands and Deep Water Habitats in the United States (Cowardin et al., 1992), the 2008 Interim Regional Supplement to the USACE Wetland Delineation Manual: Arid West Supplement (Arid West Supplement) (USACE, 2008a), the Regulatory Program CWA Guidance to Implement the U.S. Supreme Court Decision for the Rapanos and Carabell Cases (USACE 2008b), and the Field Guide to the Identification of the Ordinary High Water Mark (OHWM) on the Arid West Region of the United States (USACE, 2008c).

Suspected jurisdictional areas were field checked for the presence of an OHWM, definable channels and/or wetland vegetation, soils and hydrology. Where distinct boundaries between wetland vegetation communities, those that are dominated by obligate species, and upland vegetation communities, those that

are dominated by facultative upland or upland species, occurred, wetland limits were based upon vegetation mapping. Where the presence of wetlands was suggested by either hydrophytic vegetation or indicators of hydrology, a soil pit was established. A total of four soil pits were dug between February 22-23, 2012.

While in the field jurisdictional limits were recorded onto a color aerial photograph using visible landmarks or by walking polylines with a Trimble GPS unit. Upon completion of fieldwork, all data collected in the field were incorporated into a Geographic Information System (GIS) along with basemap data. The GIS was then used to quantify the extent of jurisdictional areas (Appendix A, Figures 5a-5t). Other data were recorded onto wetland data sheets (attached as Appendix C), available topographic data (attached as Appendix D), and USACE provided spreadsheets (attached as Appendix E). Upland non-jurisdictional features were further evaluated for hydrologic connectivity with the results provided in Appendix F.

3.0 REGULATORY SETTING

3.1 U.S. ARMY CORPS OF ENGINEERS

The USACE regulates the discharge of dredged or fill material into Waters of the U.S. pursuant to Section 404 of the CWA.

3.1.1 Waters of the U.S.

The term "Waters of the U.S." is defined in USACE regulations at 33 CFR Part 328.3(a) as:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- All interstate waters including interstate wetlands;
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters;
- Which or could be used by interstate or foreign travelers for recreation or other purposes; or
- From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
- Which are used or could be used for industrial purpose by industries in interstate commerce;
- All impoundments of waters otherwise defined as Waters of the U.S. under the definition;
- Tributaries of waters identified in paragraphs (a) (1) through (4) of this section;
- The territorial seas;
- Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1) through (6) of this section; and
- Waters of the U.S. do not include prior converted cropland.

The limits of USACE jurisdiction in non-tidal waters extends to the OHWM which is defined at 33 CFR 328.3(e) as:

> "…that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses 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."

3.1.2 Wetlands

The term "wetlands" (a subset of "Waters of the U.S.") is defined at 33 CFR 328.3(b) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support...a prevalence of vegetation typically adapted for life in saturated soil conditions." In 1987, the Corps published a manual to guide its field personnel in determining jurisdictional wetland boundaries followed by the Arid West Supplement in 2008. The methodology set forth in the 1987 Wetland Delineation Manual and Arid West Supplement generally requires that, in order to be considered a wetland, the vegetation, soils, and hydrology of an area exhibit at least minimal hydric characteristics. While the manual provides great detail in methodology and allows for varying special conditions, a wetland should normally meet each of the following three criteria:

1. The plant community must be determined to by hydrophytic based on: (1) the dominance test applied using the 50/20 rule[3], or (2) where the vegetation fails the dominance test and wetland hydrology and hydric soils are present, vegetation is determined to be hydrophytic using the Prevalence Index test[4] based upon the indicator status (i.e., rated as facultative or wetter) in the National List of Plant Species that Occur in Wetlands[5]);
2. Soils must exhibit physical and/or chemical characteristics indicative of permanent or periodic saturation (e.g., redoximorphic features with a matrix of low chroma indicating a relatively consistent fluctuation between aerobic and anaerobic conditions); and
3. Hydrologic characteristics must indicate that the ground is saturated to within 12 inches of the surface for a sufficient period to cause: (1) the formation of hydric soils; and (2) establishment of a hydrophytic plant community. A positive test for wetland hydrology is based on the presence of one primary or two secondary indicators.

3.1.3 Supreme Court Decisions

3.1.3.1 Solid Waste Agency of North Cook County

On January 9, 2001, the Supreme Court of the United States issued a decision on *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, et al.* with respect to whether the USACE could assert jurisdiction over isolated waters. The Solid Waste Agency of North Cook County (SWANCC) ruling stated that the USACE does not have jurisdiction over "non-navigable, isolated, intrastate" waters.

[3] If a particular species accounts for more than 50% of the total coverage of vegetation in the stratum, or for at least 20% of the total coverage in the stratum which the species was found, that species is defined as dominant.
[4] A Prevalence Index is calculated using wetland indicator status and relative abundance for each vascular plant species present.
[5] Reed, P.B., Jr. 1988. *National List of Plant Species that Occur in Wetlands*. U.S. Fish and Wildlife Service Biological Report 88(26.10).

3.1.3.2 Rapanos/Carabell

In the Supreme Court cases of *Rapanos* v. *United States* and *Carabell* v. *United States* (herein referred to as *Rapanos*), the court attempted to clarify the extent of USACE jurisdiction under the CWA. The nine Supreme Court justices issued five separate opinions (one plurality opinion, two concurring opinions, and two dissenting opinions) with no single opinion commanding a majority of the Court. In light of the *Rapanos* decision, the USACE will assert jurisdiction over traditional navigable waters, wetlands adjacent to traditional navigable waters, non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months) and wetlands that directly abut such tributaries. The USACE will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water: non-navigable tributaries that are not relatively permanent, wetlands adjacent to non-navigable tributaries that are not relatively permanent, and wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

Flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary indicate whether they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters. Analysis of potentially jurisdictional streams includes consideration of hydrologic and ecologic factors. The consideration of hydrological factors includes volume, duration and frequency of flow, proximity to traditional navigable waters, size of watershed, average annual rainfall, and average annual winter snow pack. The consideration of ecological factors also includes the ability for tributaries to carry pollutants and flood waters to a TNW, the ability of a tributary to provide aquatic habitat that supports a TNW, the ability of wetlands to trap and filter pollutants or store flood waters, and maintenance of water quality.

According to a USACE guidance document (USACE 2008a) the USACE generally will not assert jurisdiction over the following features: swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow) and ditches (including roadside ditches) excavated wholly in and draining only uplands that generally do not carry a relatively permanent flow of water.

3.2 REGIONAL WATER QUALITY CONTROL BOARD

The RWQCB regulates activities pursuant to Section 401(a)(1) of the federal CWA. Section 401 of the CWA specifies that certification from the State is required for any applicant requesting a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities that may result in any discharge into navigable waters.

3.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

The State of California regulates water resources under Section 1600-1616 of the California Fish and Game Code. Section 1602 states:

> "An entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake."

CDFW jurisdiction includes ephemeral, intermittent and perennial watercourses and extends to the top of the bank of a stream or lake if unvegetated, or to the limit of the adjacent riparian habitat located contiguous to the watercourse if the stream or lake is vegetated.

4.0 RESULTS

A jurisdictional delineation of the survey area identified waters of the U.S. including wetlands and CDFW riparian and unvegetated streambed occurring onsite (Appendix A, Figures 5a-5t). Additionally, several non-jurisdiction upland ditches were identified within the survey area. The following is a discussion of survey results.

A total of five major offsite drainage features either cross or are located longitudinally to the rail corridor. The crossings from west to east are known as Warm Creek (Historic) (Bridge 1.1), Twin Creek (Bridge 2.2), Santa Ana River (Bridge 3.4), Bryn Mar Road (Bridge 5.75), and Mill Creek Zanja (Bridge 9.4). Mission Zanja Creek occurs adjacent to the eastern segment of the rail corridor. The following is a description of these features:

Santa Ana River

The main drainage feature within the Santa Ana Watershed is the Santa Ana River which is approximately 96 miles long, with its major upstream tributaries, including Bear Creek and Mill Creak. Other tributaries just downstream of the survey area include Lytle Creek originating in the San Gabriel Mountains and the San Jacinto River originating in the San Jacinto Mountains. The Santa Ana River bisects the survey area at Mile Post (MP) 3.4 (or Bridge 3.4), which corresponds with approximately River Mile 28.62 (or Reach 4).

A portion of the Santa Ana River occurs within the survey area between Waterman and Tippecanoe Streets (Appendix A, Figure 5g). The streambed consists primarily of unvegetated fine sandy substrate with some cobble and areas of raised vegetated bars/islands. The bars and islands are primarily dominated by willow (*Salix* sp.) scrub, cottonwood, and mulefat with some upland species occurring in the understory such as California sagebrush (*Artemisia californica*) and flat-top buckwheat (*Eriogonum fasciculatum*) (Appendix B, Photographs 6, 7, 8, and 11). Within the survey area the river is generally confined to the east and west by development or maintained (i.e., reinforced) floodplain. The northeastern and southeastern banks of the river are vegetated with cottonwood and willow scrub vegetation. The northwest portion of the river bank is leveed with concrete and metal mesh rip rap and the southwest bank supports a large stand of eucalyptus trees (Appendix B, Photograph 4). Off-road vehicles tracks are common within the unvegetated portion of the channel.

The portion of the Santa Ana River within the survey area supports an ephemeral flow regime. Ponded water was observed in the low points of the riverbed up to several weeks after winter and spring rains. However, during various biological surveys, the riverbed was generally observed to be dry. Within the survey area, the Santa Ana River supports waters of the U.S. and CDFW riparian and unvegetated streambed.

Mission Zanja Flood Control Channel

The Mission Zanja Flood Control Channel (or Mission Zanja Channel) parallels the rail corridor to the south from its confluence with the Santa Ana River to approximately 1,000 feet west of California Street; a total distance of approximately 2.6 miles. Owned and maintained by SBCFCD, the Zanja Channel

consists of an un-improved trapezoidal earthen channel with some segments supporting wire revetment (Appendix A, Figures 5g-5m; Appendix B, Photographs 6 and 12). The western terminus of the channel (outlet into Santa Ana River) supports dense native riparian vegetation and is heavily incised (15-20 feet). Trash and debris can be found throughout the channel.

The Mission Zanja Channel is culverted where it is crossed by paved roads through the cities of Loma Linda and Redlands. The channel has been artificial levied to decrease the risk of flooding to near by communities as a result to surrounding urban encroachment. Due to the surround urbanization there are many storm water drains that discharge into the channel.

Within the survey area, Mission Zanja Channel is ephemeral and supports waters of the U.S. and CDFW riparian and unvegetated streambed.

Twin Creek

Twin Creek (also known as "East Twin Creek and Warm Creek Channel") is a major channel that conveys flows from the Twin Creek Spreading Grounds in northern San Bernardino to its confluence with the Santa Ana River at the northeast quadrant of I-10/I-215 separation. Twin Creek is owned, operated, and maintained by the San Bernardino County Flood Control District (SBCFCD). According to USACE record drawings, Twin Creek consists of a 60-foot wide by 14-foot high rectangular concrete channel (RCC) through the survey area (Appendix A, 5c-5d; Appendix B, Photograph 3). Further downstream, the channel transitions to an unimproved (earthen) 202-foot wide base trapezoidal channel (with 2 to 1 side slopes) prior to discharging into Reach 5 of the Santa Ana River. The portion crossing the rail corridor was constructed in 1958.

Twin Creek primarily occurs as a large, unvegetated, concrete-lined channel, with vertically incised banks, and flows northeast to southwest through the survey area. The southern portion of the creek occurring in the survey area transitions to a sandy substrate with steeply sloped concrete banks. The sandy streambed supports sparse wetland vegetation, primarily low herbaceous plants and early successional shrub (mulefat) and sapling tree species (*Salix* spp., cottonwood). Within the survey area, Twin Creek is ephemeral and supports waters of the U.S. including wetlands and CDFW riparian and unvegetated streambed.

Warm Creek (Historic)

Warm Creek (Historic) extends from north of the City of Highland downstream to its confluence with the Santa Ana River at the southwest quadrant of the I-10/I-215 separation (Appendix A, Figure 5a; Appendix B, Photograph 5). The East Twin and Warm Creek improvements constructed by the USACE in 1961 diverted most of the original flows to the SAR at a point 1.4 miles upstream of its original confluence, resulting in a rerouting of the portion of Warm Creek from about 5th Street south to Central Avenue. The Warm Creek Bypass Channel today connects the Twin Creek Channel to the downstream Warm Creek Channel. Consequently, the left over portion of Warm Creek no longer serves as a regional flood control facility but only conveys tributary local drainage (about 18 square miles) from the City of San Bernardino (HDR 2012a); hence, this remaining portion of the channel is referred to as Warm Creek (Historic) throughout the delineation report. Currently, the City of San Bernardino owns, operates, and maintains Warm Creek (Historic).

Within the survey area, Warm Creek primarily occurs as a narrow, un-vegetated, concrete-lined channel, with vertically incised banks, and flows north to south through the survey area. Warm Creek supports waters of the U.S. and CDFW unvegetated streambed.

Mill Creek Zanja

Mill Creek Zanja occurs within the survey area at MP 9.5 (Appendix A, Figure 5r-5s; Appendix B, Photographs 13 and 14). The ephemeral creek was originally built by Native Americans as a ditch for water supply in 1819. As the area developed, the use of the Mill Creek transformed from water supply to a flood control and drainage channel. The Mill Creek Zanja, from 9th Street to Mill Creek, is designated as a State and Federal Historic Structure. SBCFCD owns the portion of the Mill Creek upstream and downstream of the Study Area. Mill Creek is covered with grouted rip rap as it conveys flow under I-10 (east crossing). The creek supports sparse non-native vegetation, sandy substrate, riprap banks, and substantial urban trash and debris.

Within the survey area, Mill Creek Zanja is ephemeral and supports waters of the U.S. and CDFW riparian and unvegetated streambed.

Proposed Non-Jurisdictional Features

Throughout the survey area, storm water from adjacent urban areas is channeled into the railroad ROW and transported through a series of ditches. Examples of these features are provided in Appendix A, Figures 5a-5t and Appendix B, Photographs 9 and 10. These features occur entirely within upland areas, exhibit indistinct or intermittent OHWM and do not support riparian vegetation. Non-jurisdictional ditches within the Survey area are presented in Table 2. Additional details on these features are provided in Appendix E and F.

Table 2. Non-Jurisdictional Ditches within the Survey Area

Ditch ID	Existing Acreage within the Survey Area*
NJD A1	0.05
NJD A2	0.01
NJD A3	0.01
NJD B	0.25
NJD C	0.55
NJD D	0.01
NJD E	0.05
NJD F	0.01
NJD G1	0.11
NJD G2	0.01
NJD H1	<0.01
NJD H2	<0.01
NJD I1	0.01
NJD I2	0.17
NJD I3	0.02
NJD I4	0.05
NJD J1	0.05
NJD J2	0.02
NJD A1	0.05

* Acreages rounded to the nearest hundredth acre.

4.1 USACE WETLANDS AND WATERS

As discussed in Section 2.0, Methods, suspected jurisdictional areas were field checked for the presence of an OHWM, definable channels and/or wetland vegetation, soils and hydrology. Four soil pits were conducted within the survey area. The following is a summary of the results; soil data sheets can be found in the attached delineation report (Appendix C).

Soil Pit 1

Soil Pit 1 (SP1) was located in a depressional area located north of the railroad tracks (Appendix A, Figures 5h; Appendix B, Photographs 15 and 16). The area is supported by stormwater runoff from the ROW and is located adjacent to the Zanja Channel. This area exhibited a predominance of hydrophytes including: arroyo willow (FACW), Fremont cottonwood (FAC), mulefat (FAC), and desert wild grape (*Vitis girdiana*; FAC). SP1 soils supported a loam matrix of very dark brown (10YR 3/2) and exhibited redoximorphic concentrations of strong brown (7.5YR 5/6) within 25 percent of the soil matrix. Hydric soils were identified as redox depression (F8). Hydrologic indicators at SP1 included water-stained leaves and biotic crust. SP1 meets the criteria for wetlands.

Soil Pit 2

Soil Pit 2 (SP2) was located in a depressional area located north of SP1 and the railroad tracks Appendix A, Figure 5h; Appendix B, Photograph 17). The area is supported by stormwater runoff from adjacent development and is blocked from connecting with the Zanja Channel by manufactured earthen berms (Appendix B, Photograph 18). The area supports moderately dense cover of 50 percent tamarisk (*Tamarisk* sp.; FAC) and 15 percent Johnson grass (*Sorghum halipense*; FACU). Using both the hydrophytic dominance test and prevalence index worksheets, SP2 does not meet USACE hydrophytic vegetation criteria SP2 supported a silty clay loam dusky red (2.5YR 3/2) matrix at 0-2 inches and a silty clay loam olive (5Y 4/3) matrix at 2-15 inches. Soils did not exhibit redoximorphic features. Hydric soils were identified as depleted matrix (F3). Hydrologic indicators at SP2 included surface soil cracks and inundation on aerial imagery. SP2 does not meet the criteria for wetlands.

Soil Pit 3

Soil Pit 3 (SP3) was located on the northern side of the Twin Creek streambed (Appendix A, Figure 5d; Appendix B, Photograph 2). Hydrophytic vegetation is dominant at SP1 and includes sparse coverage of mulefat (FAC) and Typha (*Typha* sp.; OBL). The area occurs at the transition from concrete-lined channel bottom to sandy substrate. This area is highly disturbed with a significant amount of urban trash and debris (Appendix B, Photograph 3). SP3 soils were inundated and had a hydrogen sulfide smell when agitated. Hydric soils were identified as redox hydrogen sulfide (A4). Hydrologic indicators at SP3 included surface water, saturation, water-stained leaves, and muck surface. SP3 meets the criteria for wetlands.

Soil Pit 4

Soil Pit 4 (SP4) was located on the southern side of the Twin Creek streambed (Appendix A, Figure 5d; Appendix B, Photograph 3). Hydrophytic vegetation is dominant at SP1 and includes: *Salix* sp. (FACW) and mulefat (FAC). Similar to SP3 area, SP4 occurs at the transition from concrete-lined channel bottom to sandy substrate and supports urban trash and debris (Appendix B, Photograph 3). SP4 soils were inundated and had a hydrogen sulfide smell when agitated. Hydric soils were identified as redox

hydrogen sulfide (A4). Hydrologic indicators at SP4 included saturation, water marks, water-stained leaves, inundation on aerial imagery, and muck surface. SP4 meets the criteria for wetlands.

In summary, the survey area primarily supports waters of the U.S. including several small areas of USACE wetlands (Appendix A, Figures 5a–5t). USACE jurisdictional areas mapped within the survey area are summarized in Table 2 below.

Table 3. USACE Jurisdictional Areas within the Survey Area

Jurisdiction	Existing Acreage within the Survey Area*
USACE Waters of the US	16.7
USACE Wetlands	0.13
Total	16.83
Proposed Non-Jurisdictional Ditch**	1.39

* Acreages rounded to the nearest hundredth acre.
** Acreages in Table 2 may not add up exactly due to rounding

4.2 CDFW JURISDICTIONAL AREAS

All USACE jurisdictional drainages within the survey area are considered jurisdictional by the CDFW. CDFW jurisdiction is similar to that of USACE jurisdiction, but also extends to the top of the bank and encompasses riparian vegetation when present (Appendix A, Figures 5a-5t). CDFW jurisdictional areas occurring within the survey area are summarized in Table 3.

Table 4. CDFW Jurisdictional Areas within the Survey Area

Jurisdiction	Existing Acreage within the Survey Area*
CDFW Riparian	8.77
CDFW Unvegetated Streambed	29.84
Total	38.61
Proposed Non-jurisdictional Ditch**	1.39

* Acreages rounded to the nearest hundredth acre.
** Acreages in Table 2 may not add up exactly due to rounding.

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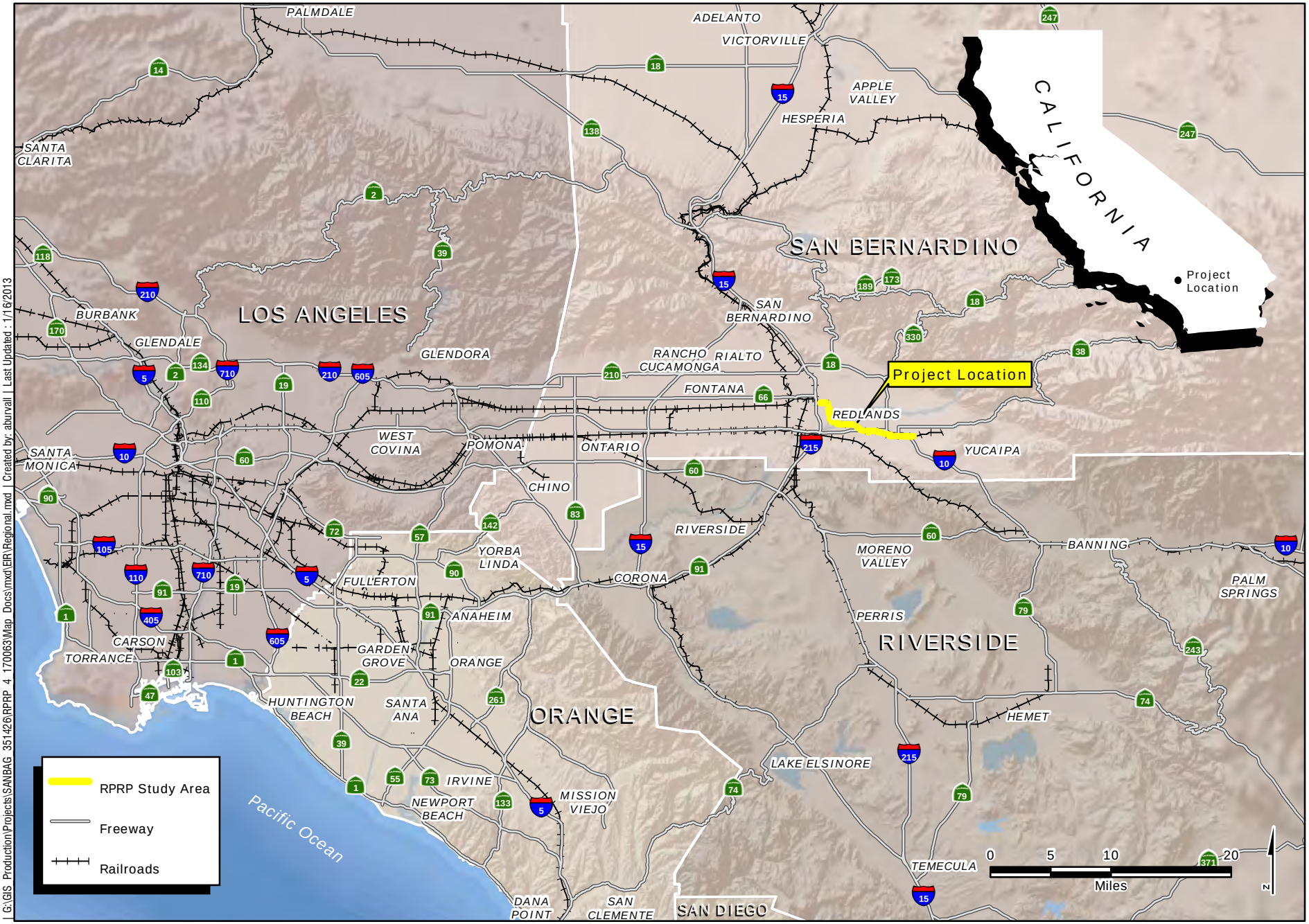
APPENDIX A

Figures



Regional Location Map

Figure 1

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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RPRP Study Area

0 1,000 2,000 4,000

Feet

N

NORTON FORCE BA

Powerplant

COLTON

SANTA ANA

TRI-CITY AIRPORT

REDLANDS

USGS Topographic Map

Figure 2a

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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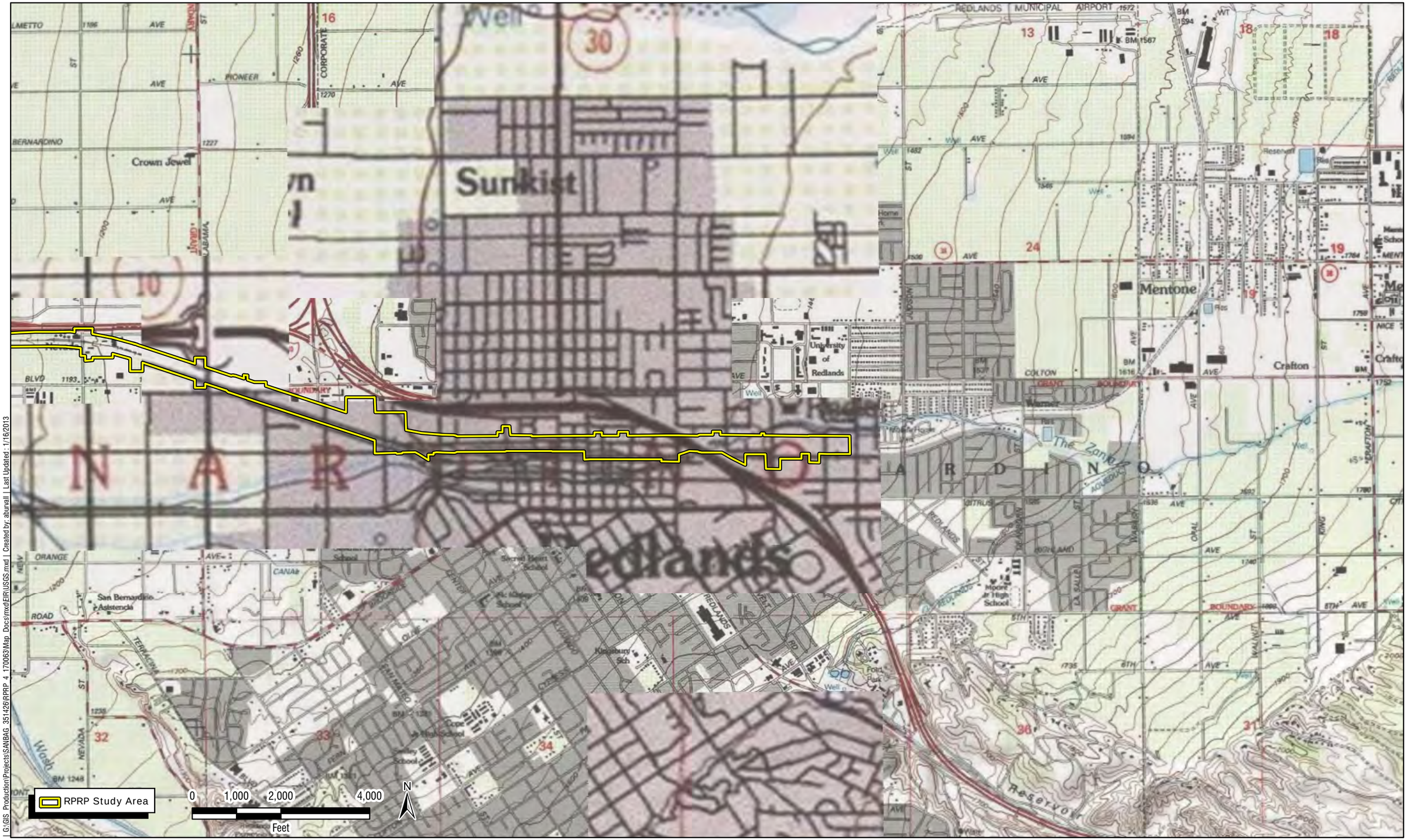

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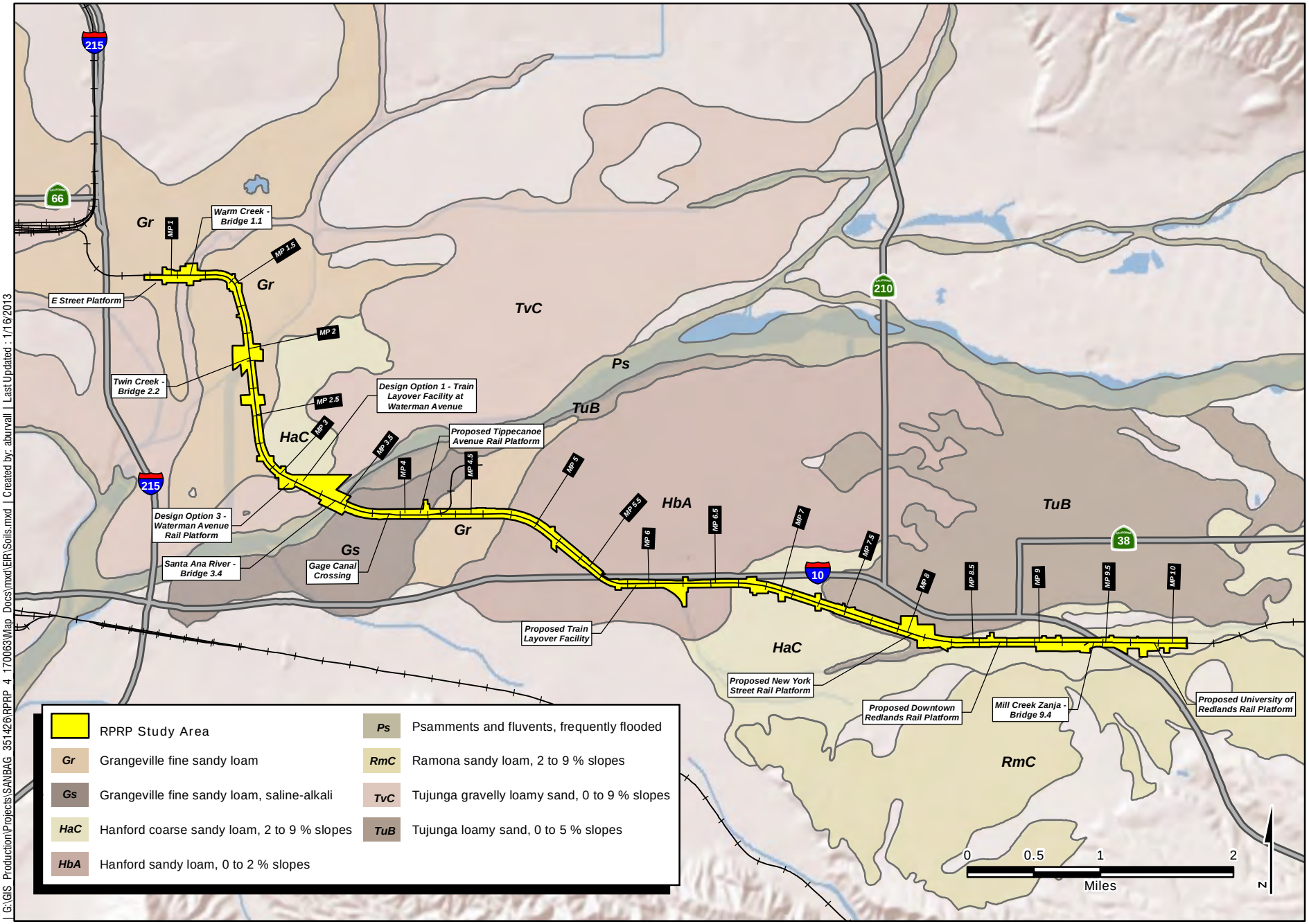
USGS Topographic Map
Figure 2b
FTA/SANBAG | Redlands Passenger Rail Project | JDR



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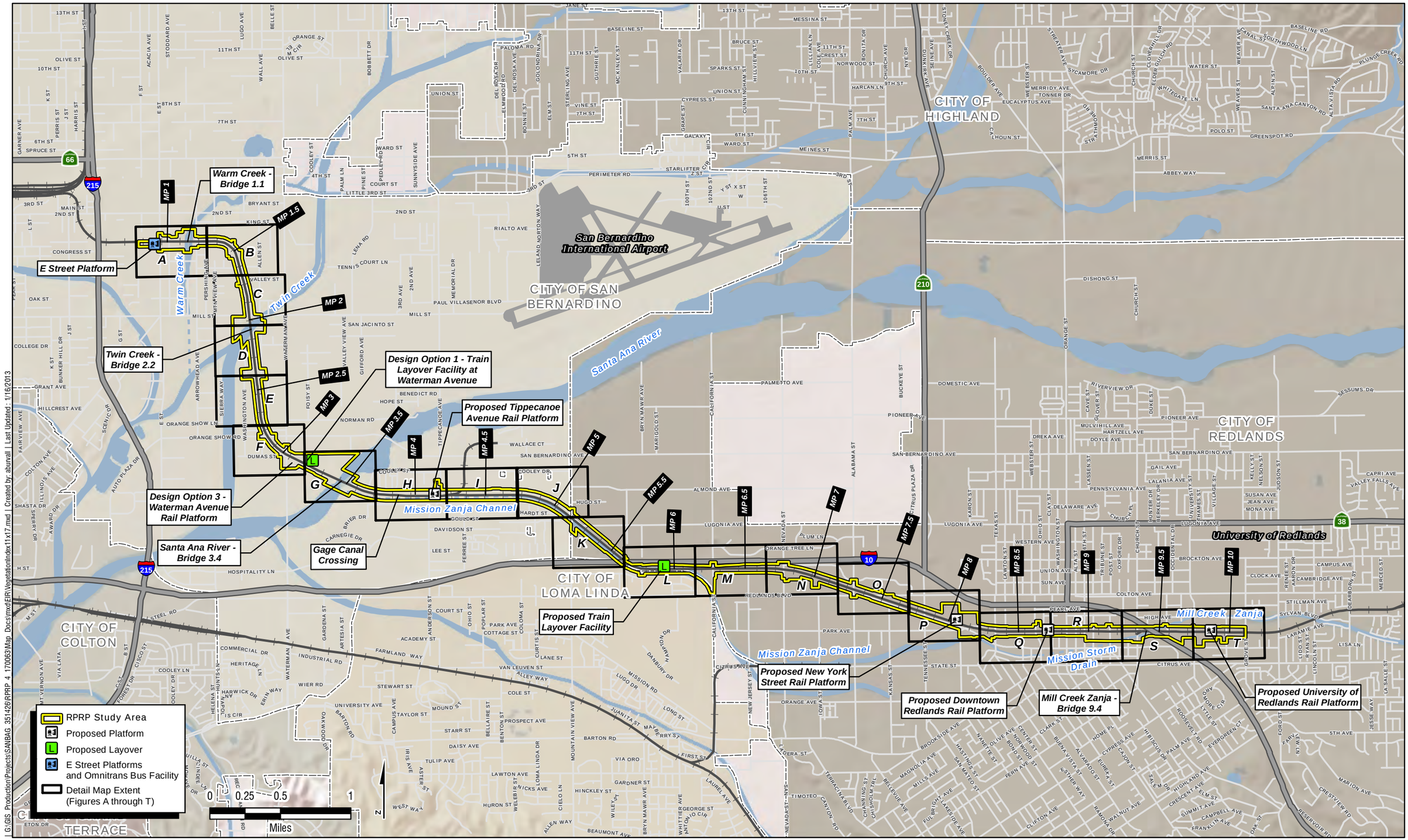
Soils

Figure 3

FTA/SANBAG | Redlands Passenger Rail Project | JDR



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Vegetation Communities Overview

Figure 4

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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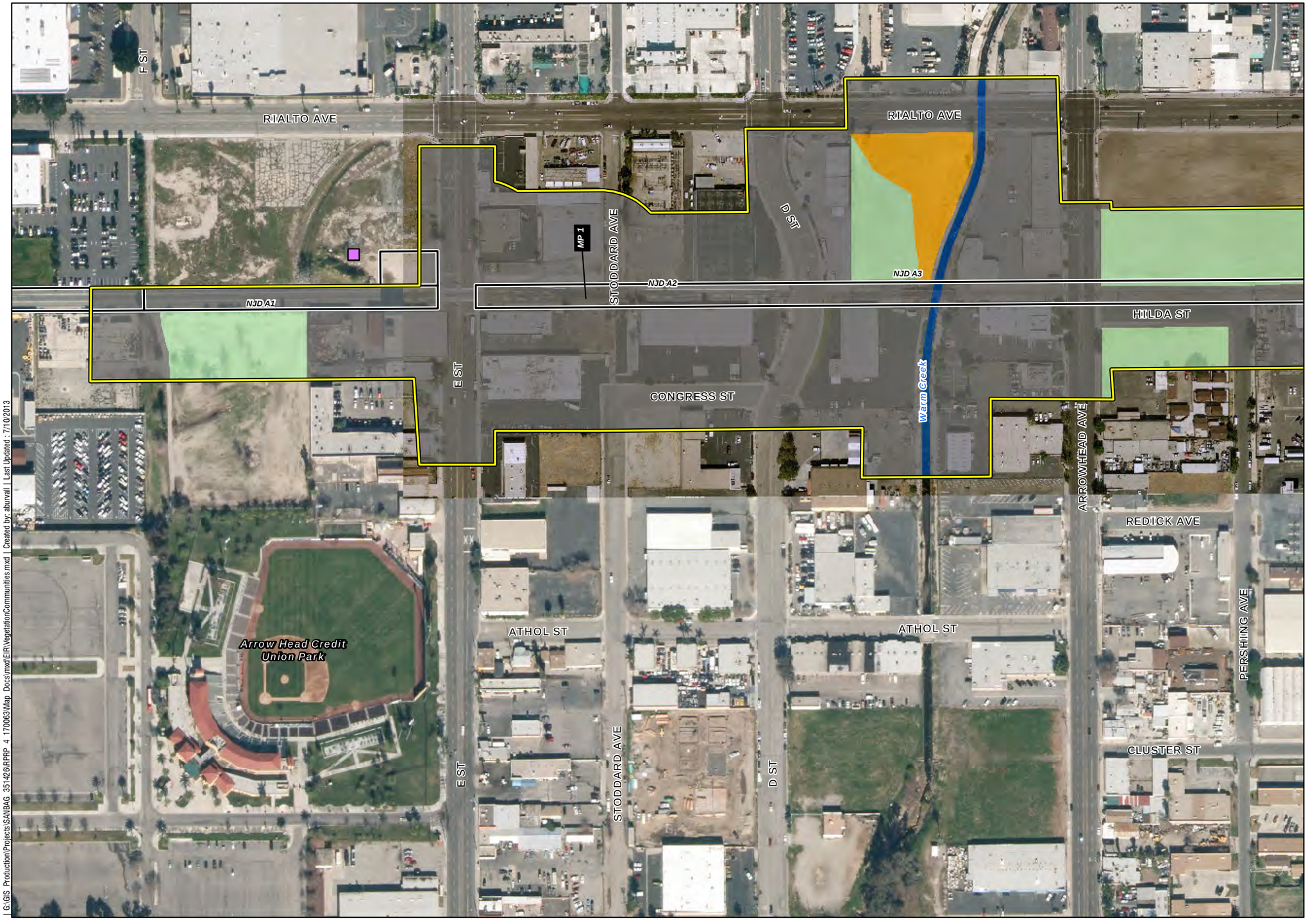


RPRP Study Area

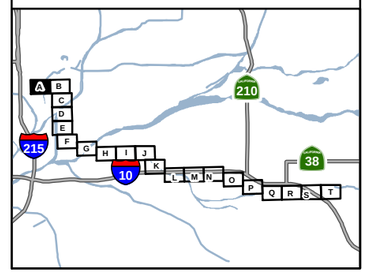
Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 A

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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RPRP Study Area

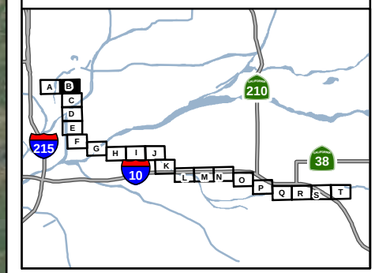
Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 B

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
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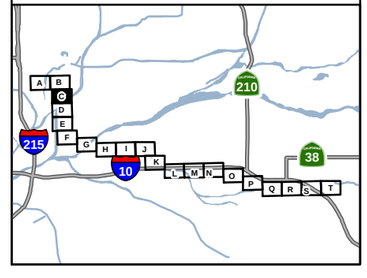
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 C

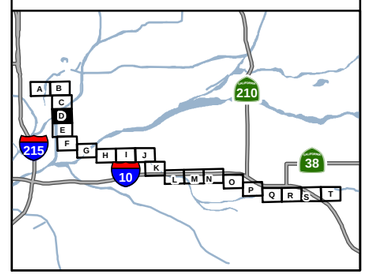
FTA/SANBAG | Redlands Passenger Rail Project | JDR

MTN VIEW AVE
Twin Creek
ALLEN ST
LINCOLN AVE
DRAKE DR
WATERMAN AVE
LUGO AVE
ALLEN ST
WATERMAN AVE
CENTRAL AVE
CENTRAL AVE

RPRP Study Area
Railroad ROW

Vegetation Community
- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation
- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 D

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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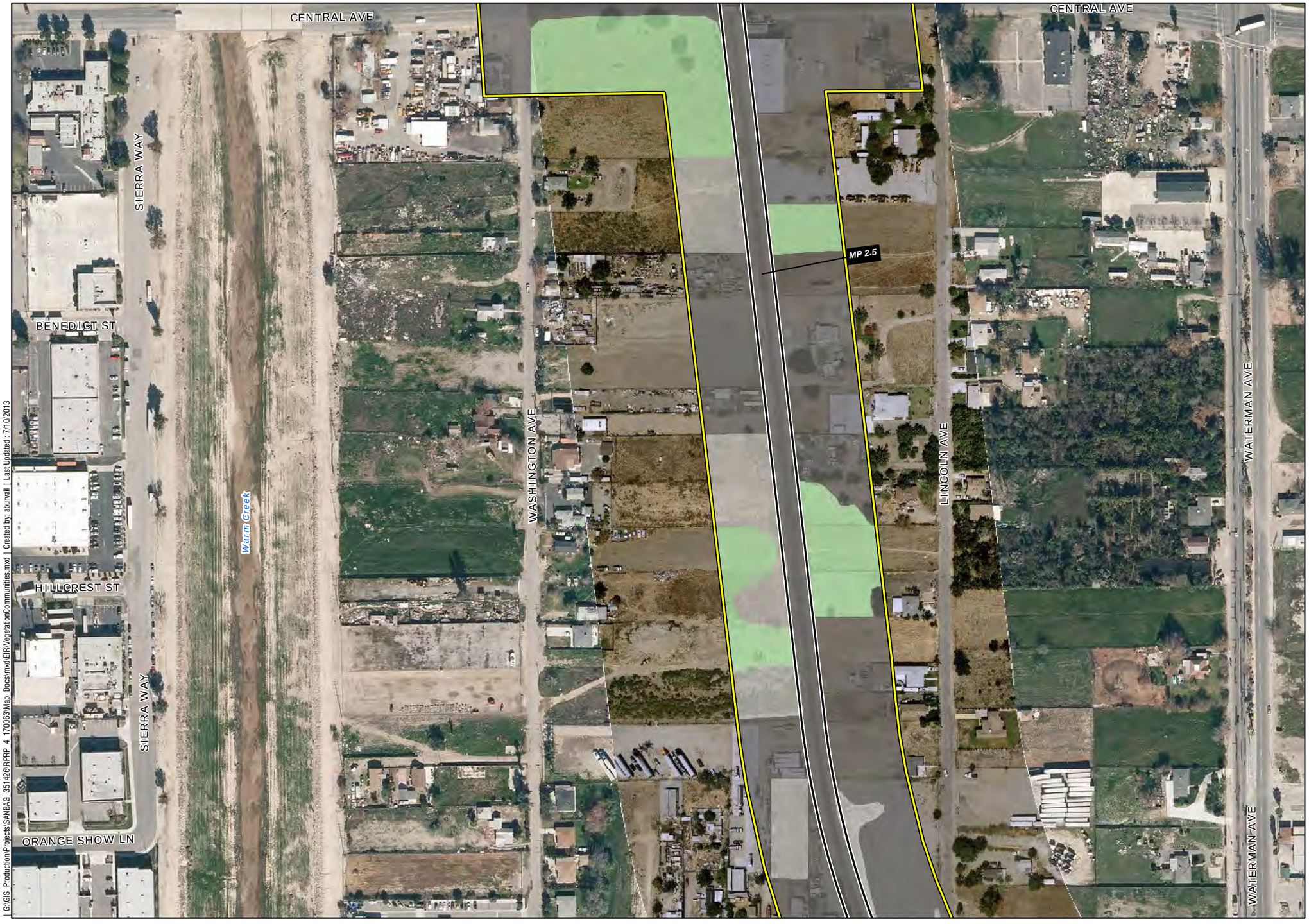

RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
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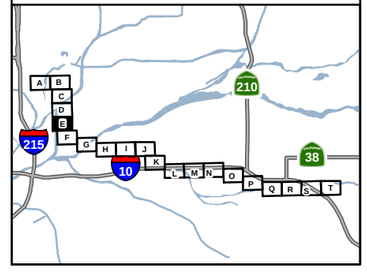
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 E

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
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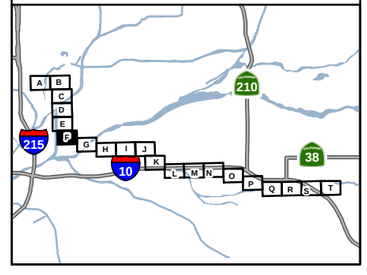
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 F

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
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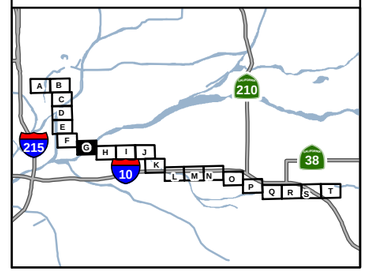
Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 G

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
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Species Observation

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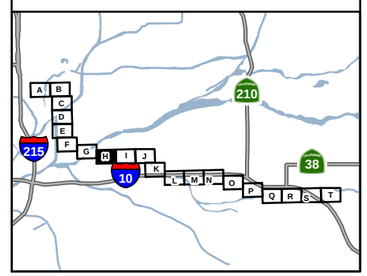

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Vegetation Communities

Figure 4 H

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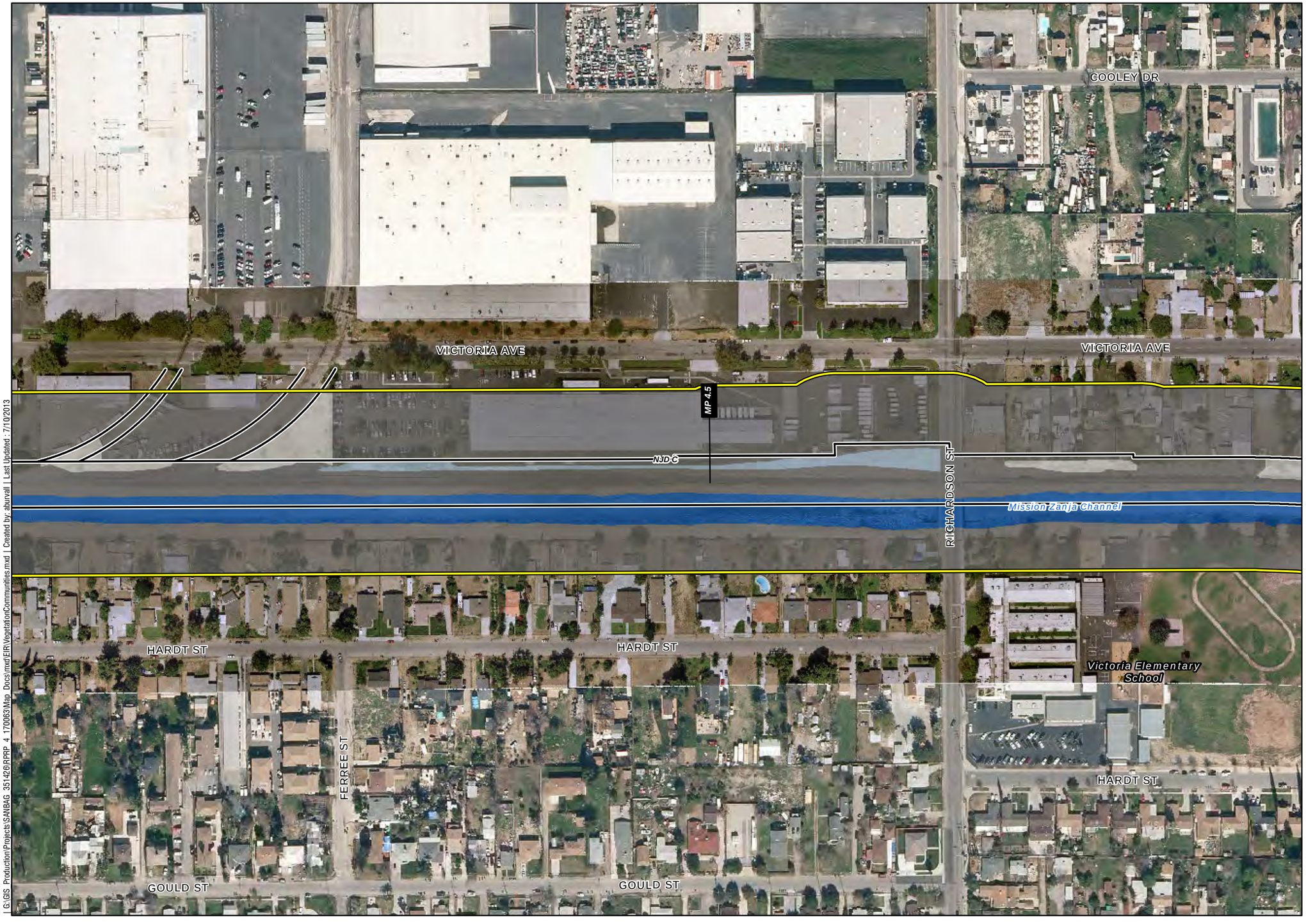

RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
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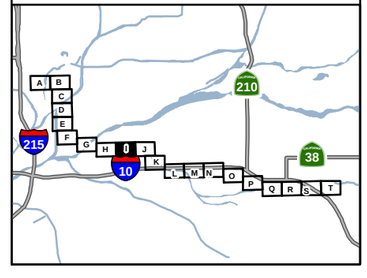
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 I

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
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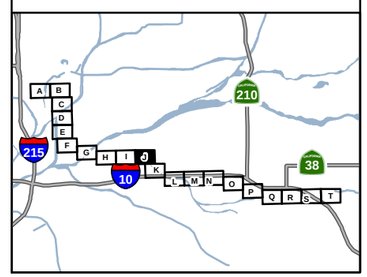

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Vegetation Communities

Figure 4 J

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
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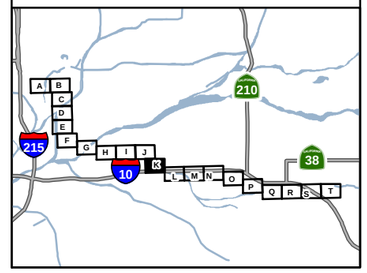
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 K

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
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- Non Jurisdictional Ditch
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- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
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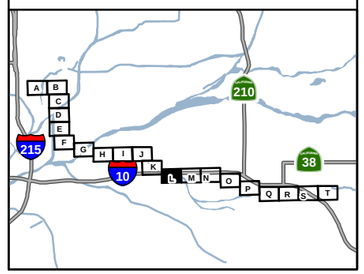

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Vegetation Communities

Figure 4 L

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
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- Oak Woodland
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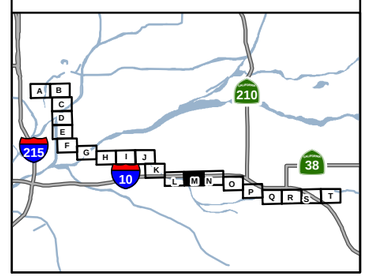
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 M

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
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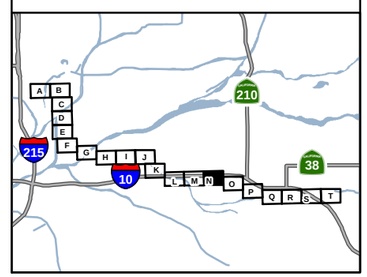
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 N

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
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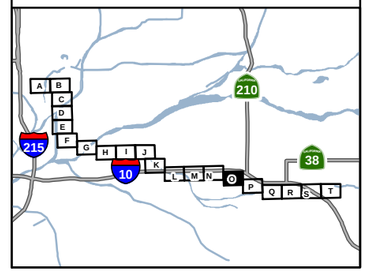
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 0

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
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Species Observation

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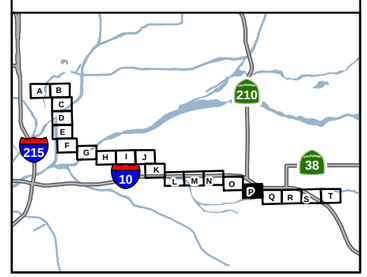

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Vegetation Communities

Figure 4 P

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
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Species Observation

- Non-Breeding Season BUOW Observation
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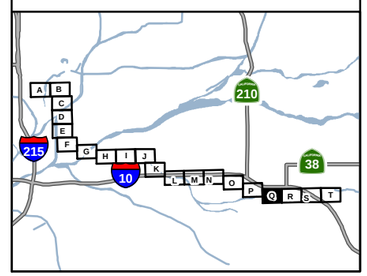

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Vegetation Communities

Figure 4 Q

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HIGH AVE
ORANGE ST
HIGH AVE
6TH ST
I 10 FWY
I 10 ONRP
HIGH AVE
3RD ST
MP 9
11TH ST
STUART AVE
STUART AVE
5TH ST
Existing Downtown
Redlands Station Platform
7TH ST
9TH ST
3RD ST
4TH ST
ORANGE ST
6TH ST
REDLANDS BLVD
5TH ST
REDLANDS BLVD
CENTRAL AVE
8TH ST
10TH ST
Redlands Mall
STATE ST
STATE ST
ORANGE ST
6TH ST
7TH ST
9TH ST

RPRP Study Area
Railroad ROW

Vegetation Community
- Disturbed Habitat
- Disturbed Wetland
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- Non-Breeding Season BUOW Observation
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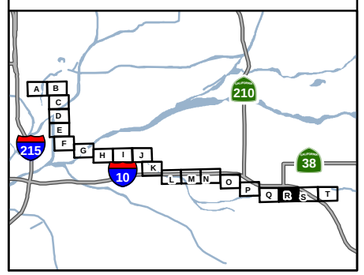

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Vegetation Communities

Figure 4 R
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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
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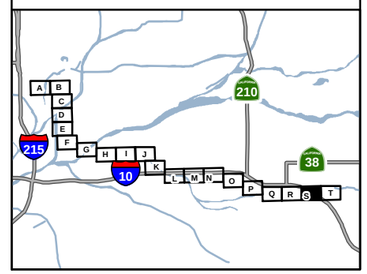

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Vegetation Communities

Figure 4 S

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University of Redlands
SYLVAN BLVD
University of Redlands
GROVE ST
JEREMY CT
SYLVAN BLVD
MP 10
COOK ST
UNIVERSITY ST
CENTRAL AVE
CENTRAL AVE
CENTRAL AVE
KAYE CT
CERO CT
COOK ST
GROVE ST
I 10 FWY
I 10 OFRP

RPRP Study Area
Railroad ROW

Vegetation Community
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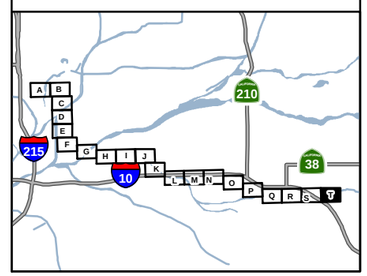

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Vegetation Communities

Figure 4 T

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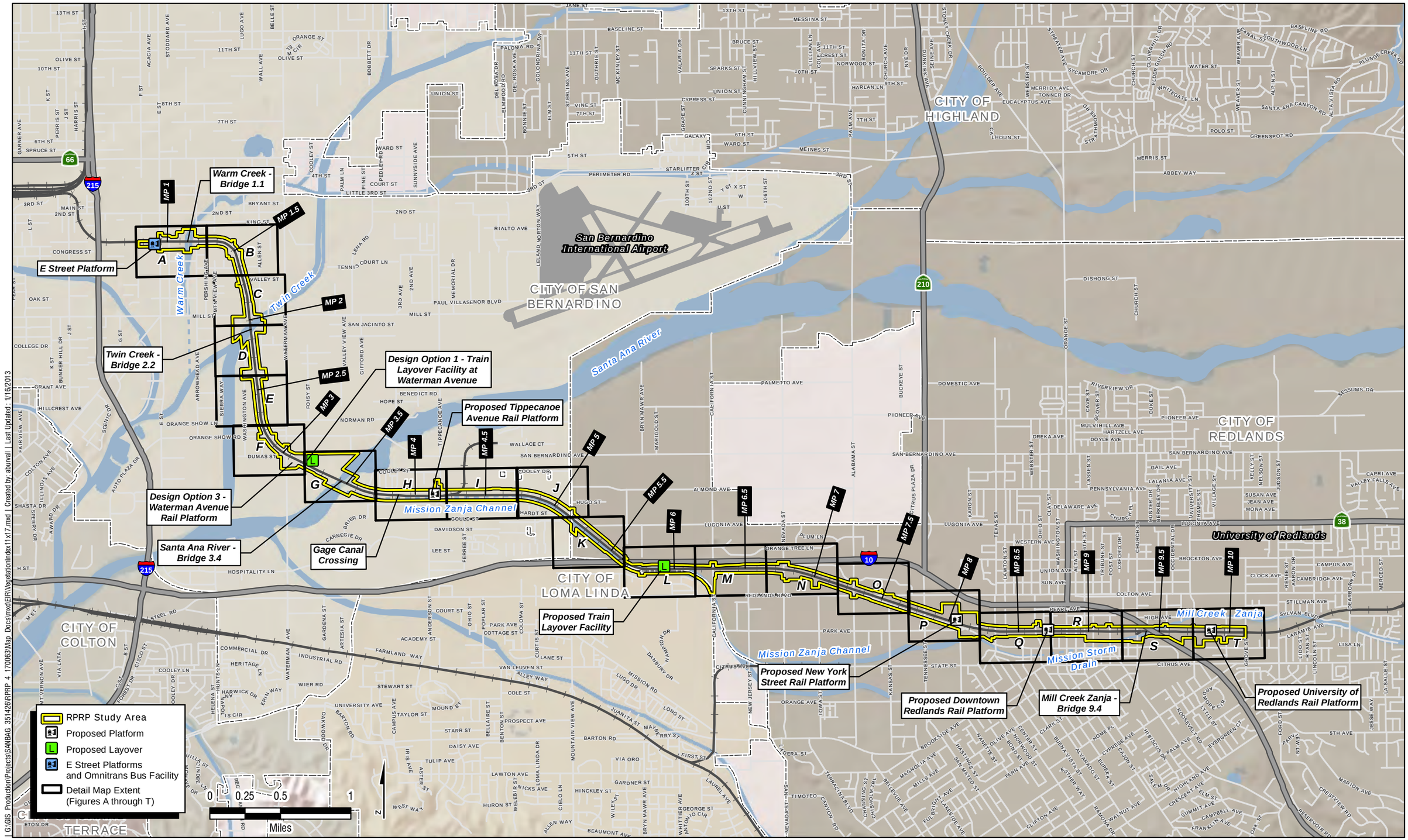

Wetland and Waters of the U.S Overview

Figure 5

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RPRP Study Area

Railroad ROW

Jurisdiction

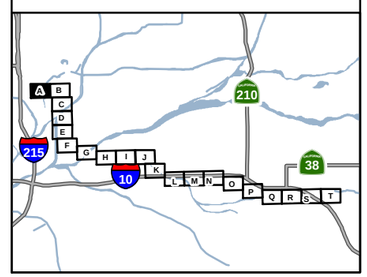
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 A

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RPRP Study Area

Railroad ROW

Jurisdiction

CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit

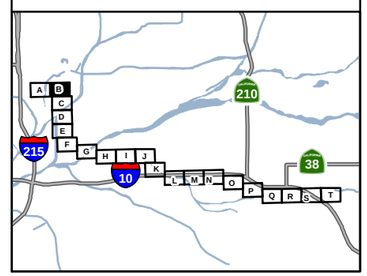

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Figure 5 B

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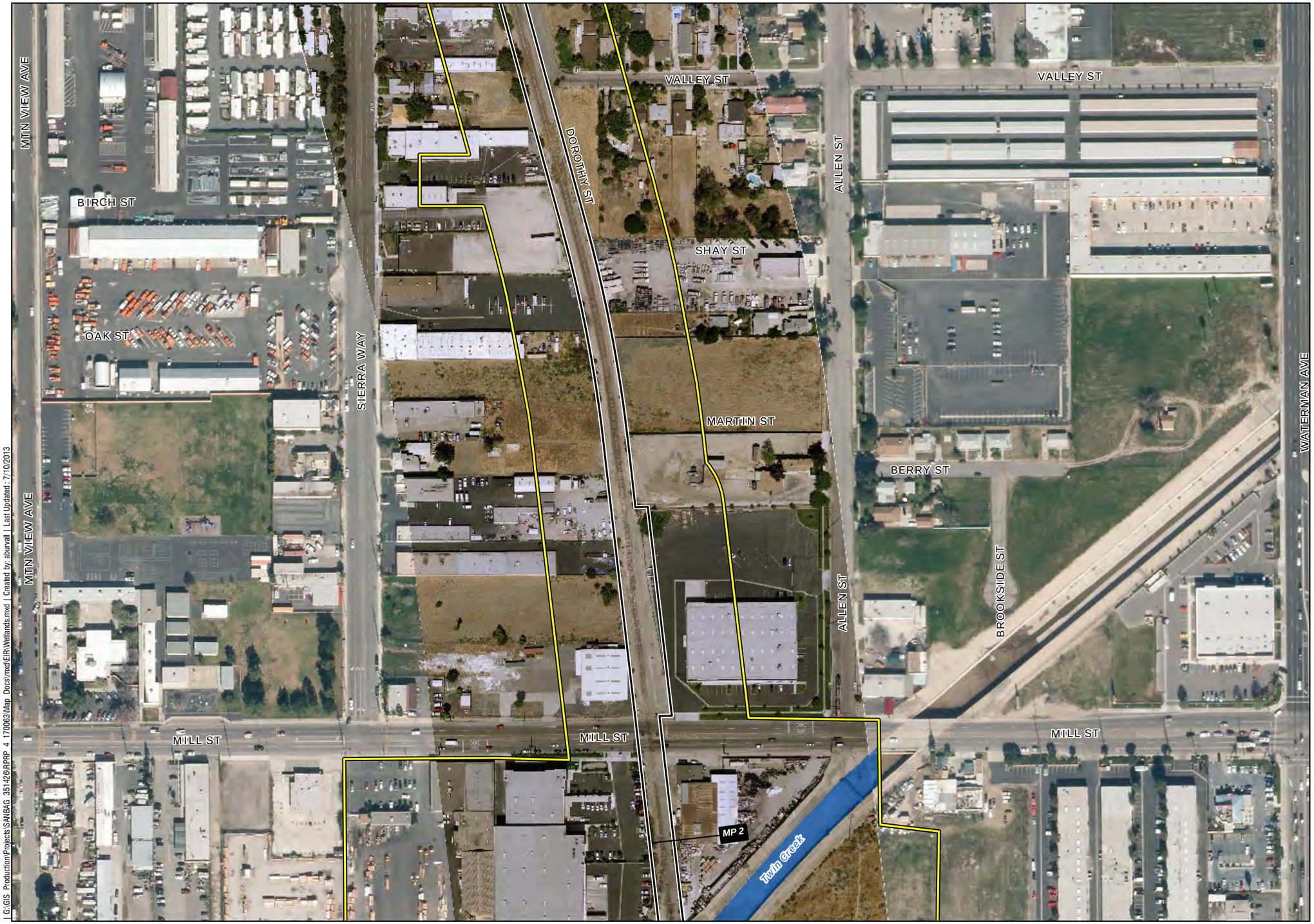

RPRP Study Area

Railroad ROW

Jurisdiction

CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit

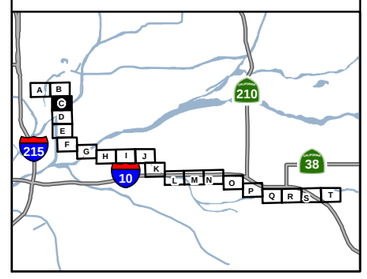

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Figure 5 C

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Railroad ROW

Jurisdiction

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USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit

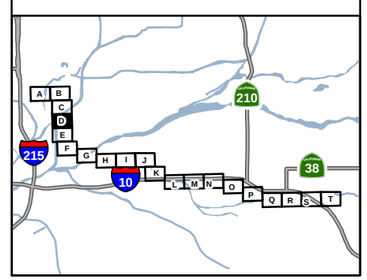

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Figure 5 D

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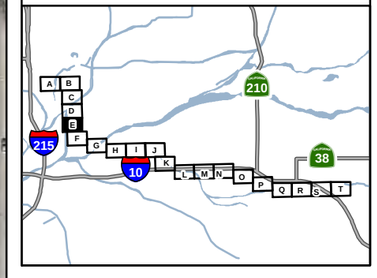
Soil Pit



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Soil Pit

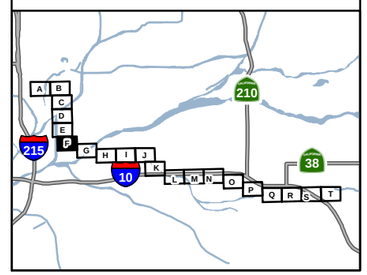

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Figure 5 F

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RPRP Study Area

Railroad ROW

Jurisdiction

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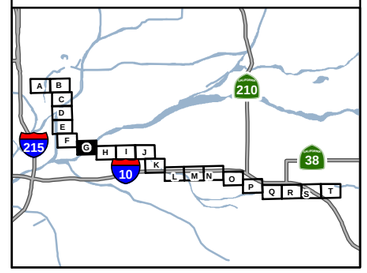
Non Jurisdictional Ditch

Soil Pit



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Soil Pit

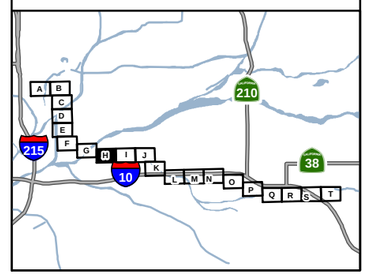

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Figure 5 H

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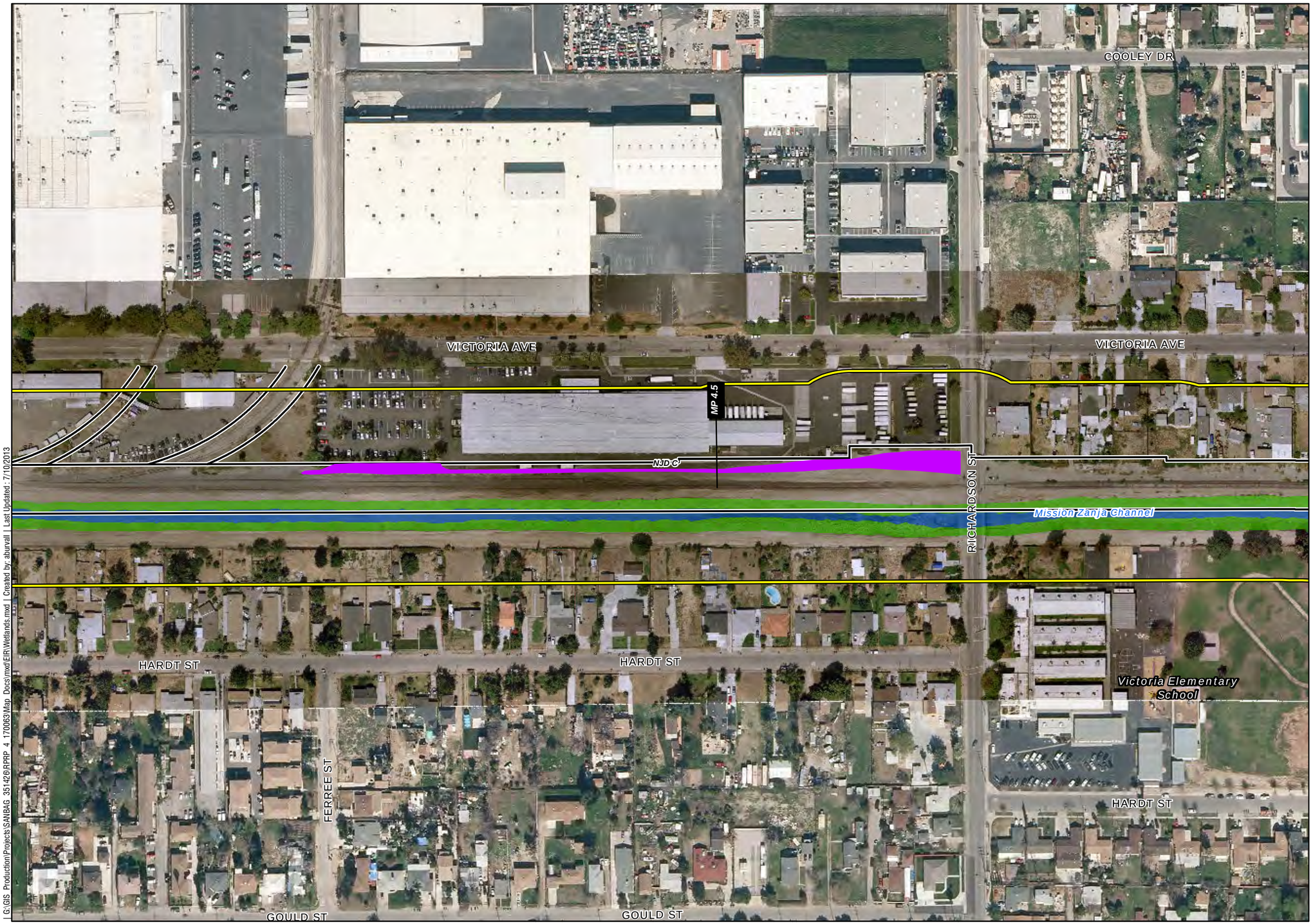

RPRP Study Area

Railroad ROW

Jurisdiction

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Non Jurisdictional Ditch

Soil Pit

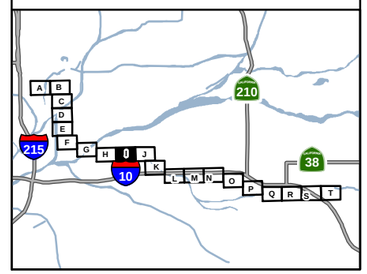

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Figure 5 I

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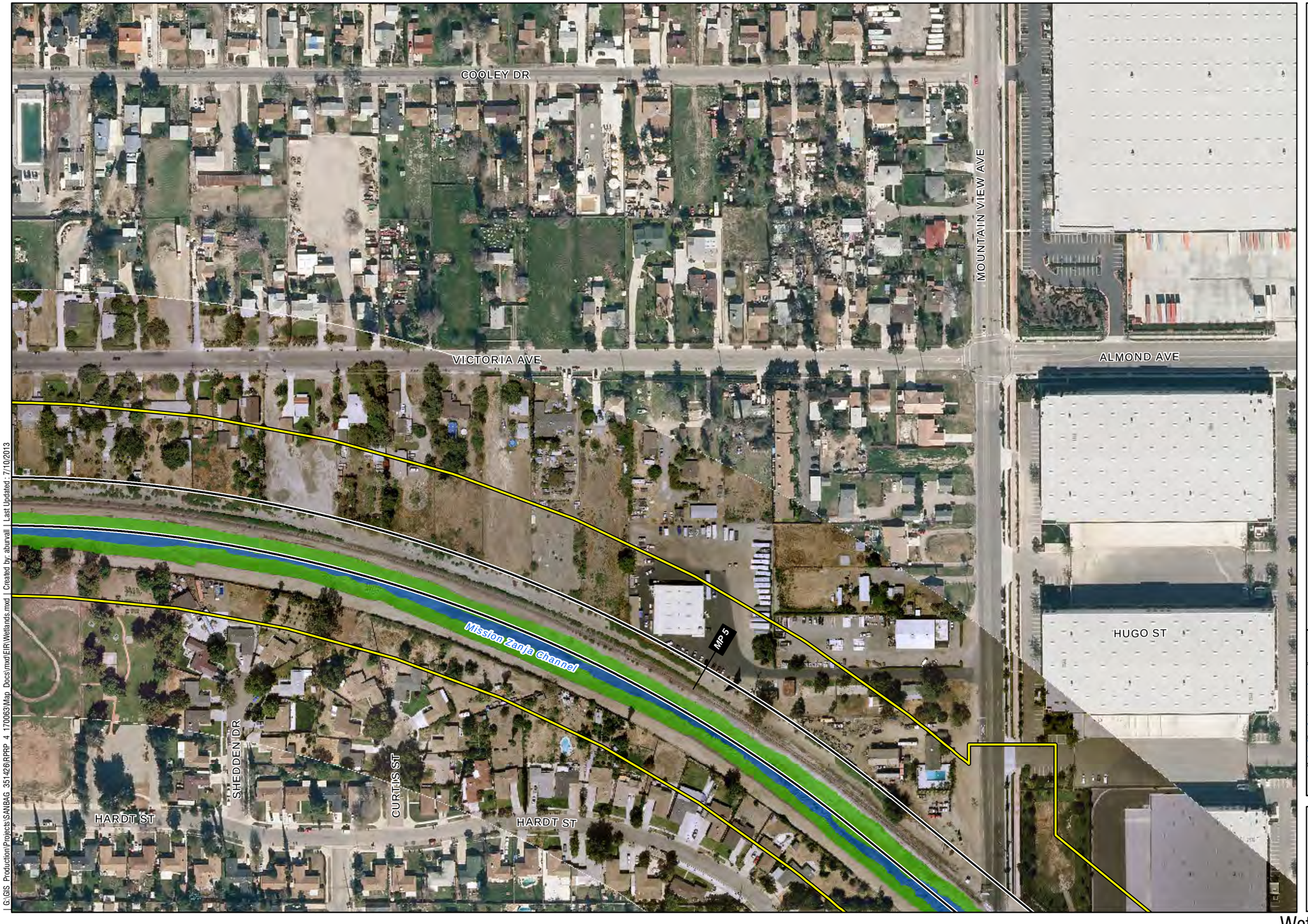

RPRP Study Area

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Jurisdiction

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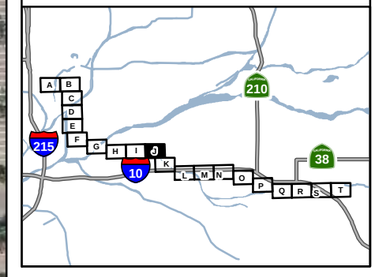
Soil Pit



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Jurisdiction

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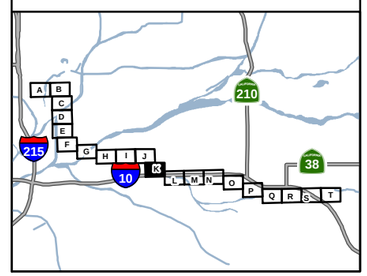
Soil Pit



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Jurisdiction

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Soil Pit

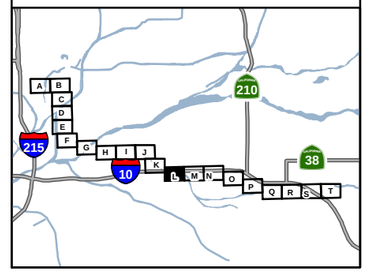

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Figure 5 L

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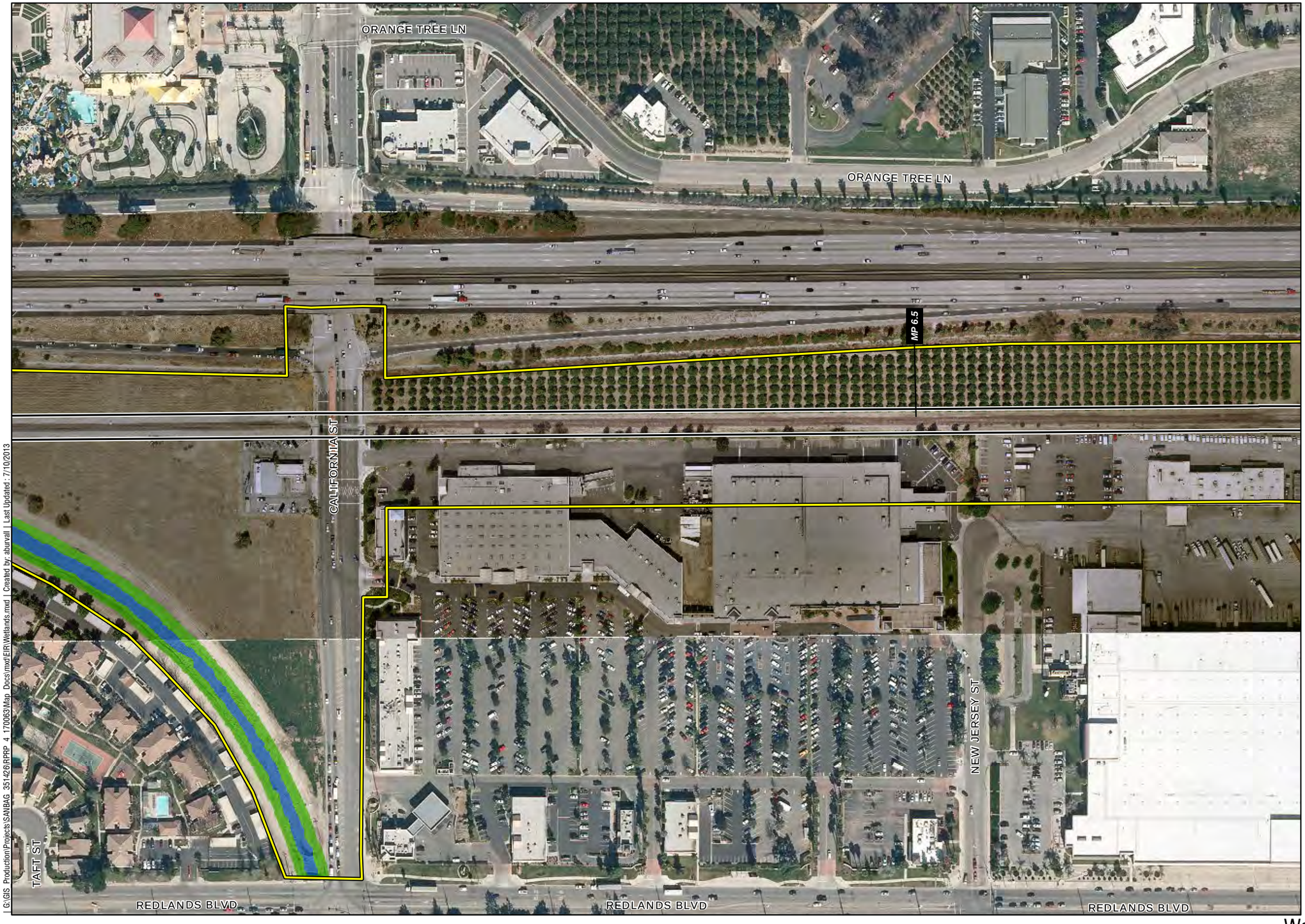


RPRP Study Area

Railroad ROW

Jurisdiction

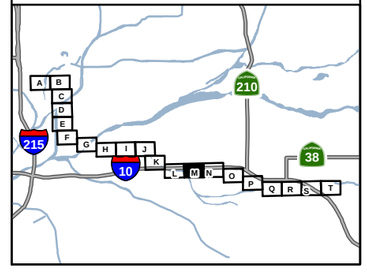
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Soil Pit

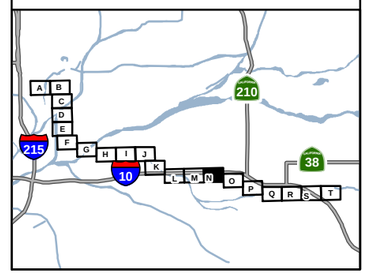

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Figure 5 N

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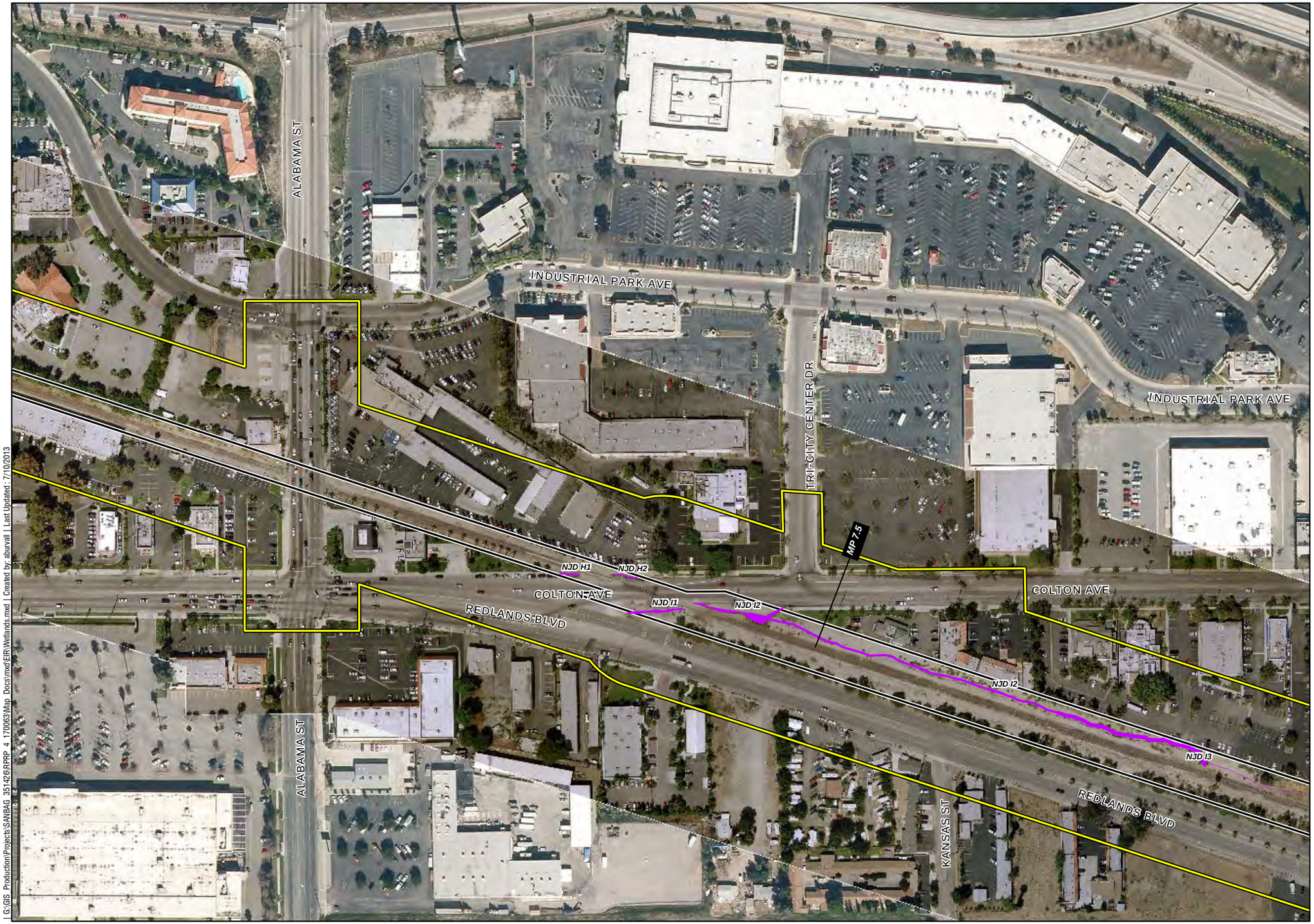


RPRP Study Area

Railroad ROW

Jurisdiction

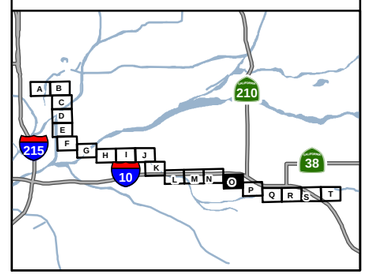
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Jurisdiction

- CDFW
- USACE Waters of the U.S
- USACE Wetlands
- Non Jurisdictional Ditch
- Soil Pit

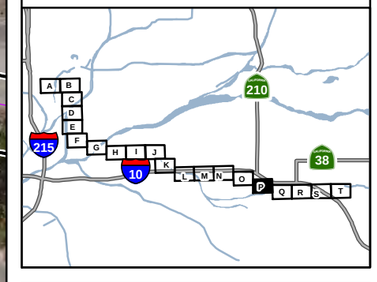

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Figure 5 P

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Jurisdiction

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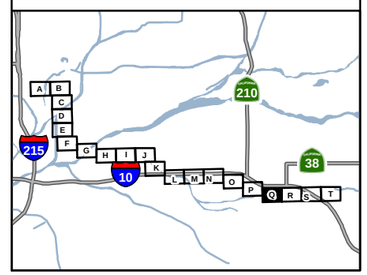

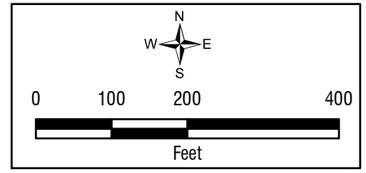

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Figure 5 Q

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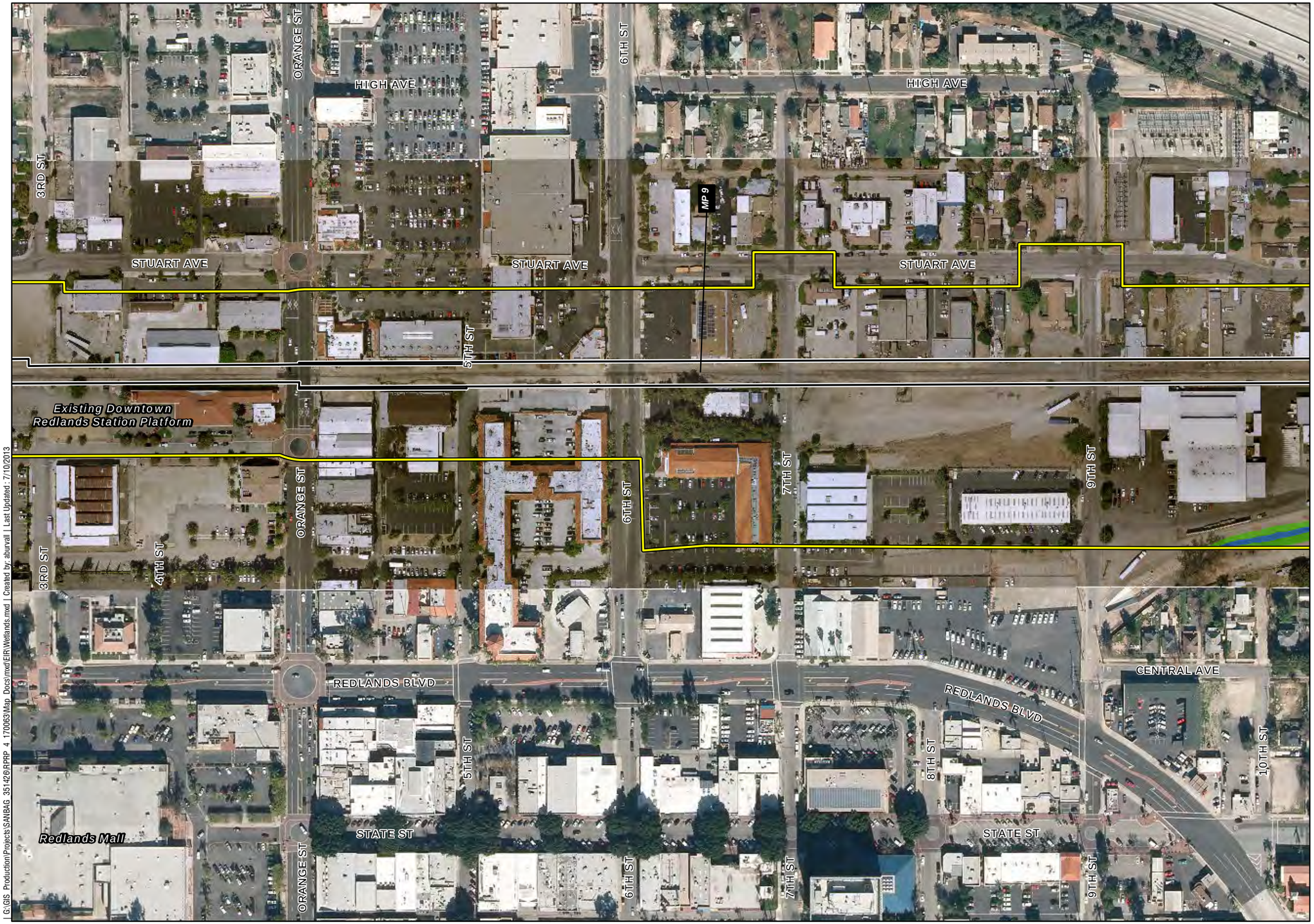


RPRP Study Area

Railroad ROW

Jurisdiction

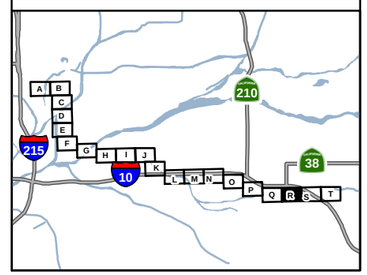
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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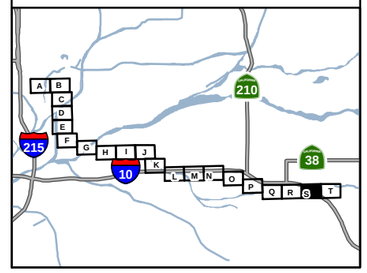
Soil Pit



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Soil Pit

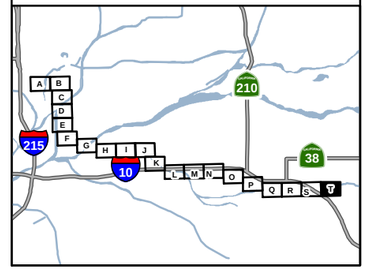

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Figure 5 T

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APPENDIX B

Site Photographs
Jurisdictional Waters and Wetlands

Photograph 1. Disturbed habitat.

Photograph 2. North side of Twin Creek. Location of soil pit #3.

Photograph 3. Twin Creek. Southwesterly view. Soil pit #3 is on north side of creek and soil pit #4 is on the south side.

Photograph 4. Eucalyptus woodland habitat.

Photograph 5. Warm Creek. Northerly view.

Photograph 6. Where the Zanja Channel meets the Santa Ana River.

Photograph 7. South side overflow of Santa Ana River. Westerly view.

Photograph 8. Overview of overflow from Santa Ana River.

Photograph 9. Urban/Developed habitat.

Photograph 10. Stormwater from adjacent urban areas channels into the railroad ROW and is transported through a series of culverts into larger drainages.

Photograph 11. Santa Ana River. Westerly view.

Photograph 12. Zanja Channel

Photograph 13. Mill Creek Zanja. Westerly view.

Photograph 14. Mill Creek Zanja. Northwesterly view.

Photograph 15. Soil pit #1.

Photograph 16. Overview of soil pit #1 location.

Photograph 17. Overview of soil pit #2 location.

Photograph 18. Manufactured earthen berm separating the storm water runoff (soil pits #1 and #2) from Zanja Channel .

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APPENDIX C

Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: RPRP City/County: San Bernardino Sampling Date: 2/23/12
Applicant/Owner: BNSF State: CA Sampling Point: Area A (93)
Investigator(s): Allegra Simmons / Sean Harris Section, Township/Range: California Land Grant
Landform (hillside, terrace, fan, etc.): stream bed Local relief (concave, convex, none): none Slope (%): —
Subregion (LRR): C Lat: 34.090421 Long: -117.283442 Datum: WGS 84
Soil Map Unit Name: NWI classification: Riverine
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? NO (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: Significant amount of trash and debris in Area A.
Location: Twin Creek

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Salix lasiolepis	15	N	FACW
2. Baccharis pilularis	25	Y	FAC
3.			
4.			
5.			
Total Cover:	40		
Herb Stratum			
1. Typha sp	25	Y	OBL
2. UNKN grass	10	N	—
3. Veronica anagallis-aquatica	10	N	OBL
4.			
5.			
6.			
7.			
8.			
9.			
Total Cover:	45		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

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:
X Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting date 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: NO BARE ground, all unvegetated areas inundated

SOIL

Sampling Point: Area A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[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 (3)
- X 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]:

- ___ Red Parent Material (TF2)
- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ 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)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation on Aerial Imagery (B7)
- X Water-stained Leaves (B8)
- ___ Biotic Crust (B10)
- ___ Aquatic Invertebrates (B11)
- ___ Crayfish Burrows (B12)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C8)
- X Muck Surface (C7)
- X Saturation on Aerial Imagery (C8)
- ___ Shallow Aquitard (D4)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B9)
- ___ Dry Season Water Table (C3)
- ___ Salt Deposits (C5)
- ___ Mud Casts (C9)
- ___ FAC-Neutral Test (D7)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): _____

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: RPRP City/County: San Bern Sampling Date: 2/22/12
Applicant/Owner: BNSF State: CA Sampling Point: Area B (SP4)
Investigator(s): Allegra Simmons, Sean Harris Section, Township/Range: California Land Grant
Landform (hillside, terrace, fan, etc.): Streambed Local relief (concave, convex, none): NONE Slope (%): 0
Subregion (LRR): C Lat: 34.090181 Long: -117.283402 Datum: WGS 84
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? ND Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? ND (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:
Twin Creek

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix sp	70	Y	FACW
2. Pop fremontii (p. deltoides)	5	N	FAC
3.			
4.			
Total Cover:	75		
Sapling/Shrub Stratum			
1. BAC SAL	20	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:	20		
Herb Stratum			
1. Avena sp	10	Y	NL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
Total Cover:	10		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

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:
X Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting date 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: Area B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[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 (3)
- X 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]:

- ___ Red Parent Material (TF2)
- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ 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 ____

Remarks: Agitation of soil released hydrogen sulfide odor.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation on Aerial Imagery (B7)
- X Water-stained Leaves (B8)
- ___ Biotic Crust (B10)
- ___ Aquatic Invertebrates (B11)
- ___ Crayfish Burrows (B12)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C8)
- X Muck Surface (C7)
- ___ Saturation on Aerial Imagery (C8)
- ___ Shallow Aquitard (D4)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (**B1**) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B9)
- ___ Dry Season Water Table (C3)
- ___ Salt Deposits (C5)
- ___ Mud Casts (C9)
- ___ FAC-Neutral Test (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): _____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No standing water but saturated soils.

Photos 46-53

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: RPPP City/County: San Bernardino Sampling Date: 2/22/12
Applicant/Owner: BRRSF State: Sampling Point: SP 2
Investigator(s): Sara Parkins & Allegra Simonds Section, Township/Range: California Land Grant
Landform (hillside, terrace, fan, etc.): depression @ culvert outlet Local relief (concave, convex, none): Concave Slope (%):
Subregion (LRR): C Lat: 34.073618 Long: -117.264699 Datum: WGS 84
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 X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? NO (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

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Use scientific names.)			
1. Salix lasiolepis	40	Y	FACW
2. Populus fremontii (p. deltoides)	40	Y	FAC
3.			
4.			
Total Cover:	80		
Sapling/Shrub Stratum			
1. Baccharis salicifolia	20	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:	20		
Herb Stratum			
1. Conyza canadensis	10	N	FAC
2. Sorghum halepense	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
Total Cover:	30		
Woody Vine Stratum			
1. Vitis girdiana	40	Y	FAC
2.			
Total Cover:	40		

% Bare Ground in Herb Stratum 2 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 80 % (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 date 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: Old fence-line is creating a berm that is giving rise to wild grape

SOIL

Sampling Point: SP2

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	75	7.5YR 5/6	25	C	M	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 (3)
- ___ 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]:

- ___ Red Parent Material (TF2)
- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ 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)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation on Aerial Imagery (B7)
- ✓ Water-stained Leaves (B8)
- ✓ Biotic Crust (B10)
- ___ Aquatic Invertebrates (B11)
- ___ Crayfish Burrows (B12)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C8)
- ___ Muck Surface (C7)
- ___ Saturation on Aerial Imagery (C8)
- ___ Shallow Aquitard (D4)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B9)
- ___ Dry Season Water Table (C3)
- ___ Salt Deposits (C5)
- ___ Mud Casts (C9)
- ___ FAC-Neutral Test (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Western edge of area has been disturbed. Depression is fed by culvert at E. end + runoff from R.R.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: PPRP City/County: San Bernardino Sampling Date: SP 2

Applicant/Owner: BNSF State: CA Sampling Point:

Investigator(s): AS, SH Section, Township/Range: California Land Grant

Landform (hillside, terrace, fan, etc.): Depressional area Local relief (concave, convex, none): Slope (%):

Subregion (LRR): C Lat: 34.073916 Long: -117.264347 Datum: WGS84

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 X significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? NO (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 X No	

Remarks: Pit taken North of SP 2 in depressional area. Water enters site from adjacent development. Flows have been blocked from connecting with Mission channel by maintained berm.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. TAMARISK FAM	50	Y	FAC
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Johnson grass	15	Y	FACU
2. Sorghum halepense			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
Total Cover:	15		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % 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: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	50	x 3 =	150
FACU species	15	x 4 =	60
UPL species		x 5 =	
Column Totals:	65 (A)		210 (B)

Prevalence Index = B/A = 3.23

Hydrophytic Vegetation Indicators:

_____ Dominance Test is >50%

_____ Prevalence Index is ≤3.0[1]

_____ Morphological Adaptations[1] (Provide supporting date 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 X

Remarks:

SOIL

Sampling Point: SP2

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
0-2	2.5Y 4/2	100	—	—			Silt clay loam	
2-15	5Y 4/3	100	—	—			silt 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 (3)
- ___ 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]:

- ___ Red Parent Material (TF2)
- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ 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)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- X Surface Soil Cracks (B6)
- X Inundation on Aerial Imagery (B7)
- ___ Water-stained Leaves (B8)
- ___ Biotic Crust (B10)
- ___ Aquatic Invertebrates (B11)
- ___ Crayfish Burrows (B12)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C8)
- ___ Muck Surface (C7)
- ___ Saturation on Aerial Imagery (C8)
- ___ Shallow Aquitard (D4)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B9)
- ___ Dry Season Water Table (C3)
- ___ Salt Deposits (C5)
- ___ Mud Casts (C9)
- ___ FAC-Neutral Test (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

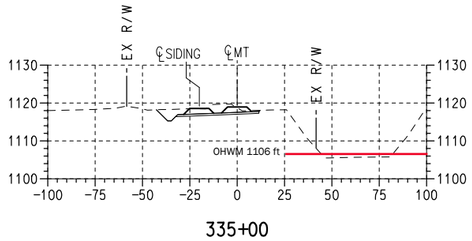
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Out flow blocked by maintained Berm - would otherwise flow to Mission channel. flows coming from offshoot of SANTA ANA River to North

APPENDIX D

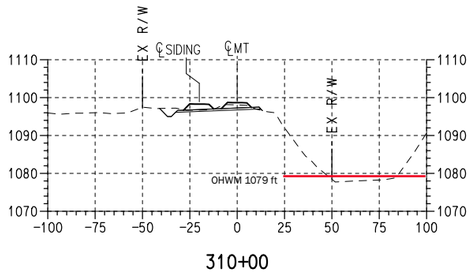
Topographic Cross Sections & OHWM

Placeholder for Exhibit 1



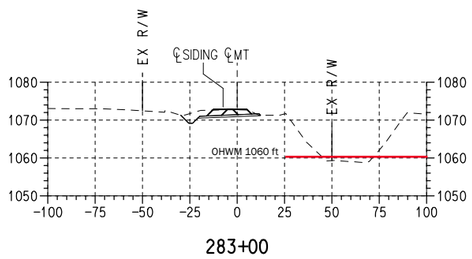
335+00

Mission Zanja Flood Control Channel - Mile Post 5.5



310+00

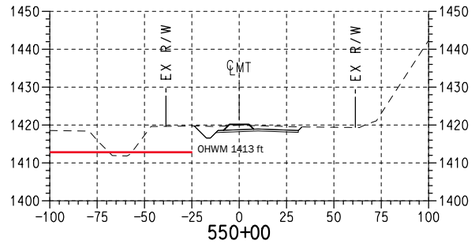
Mission Zanja Flood Control Channel - Mile Post 5



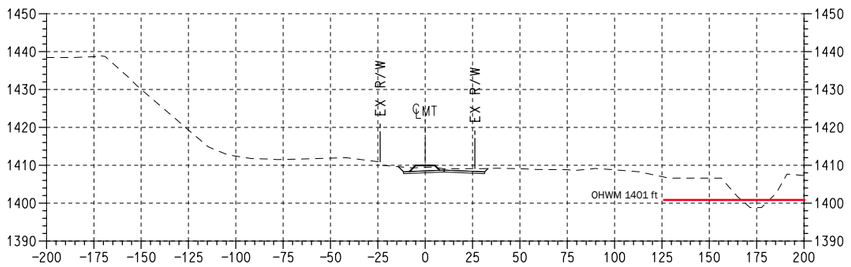
283+00

Mission Zanja Flood Control Channel - Mile Post 4.5

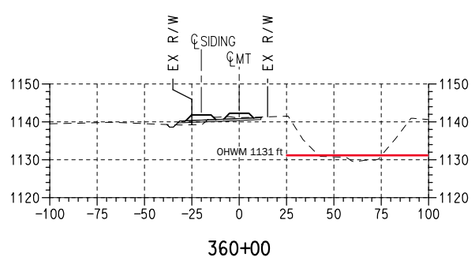
Exhibit D2. Channel Cross-Sections and OHWM



Mission Creek Zanja - Mile Post 9.5



Mill Creek Zanja - Mile Post 9.3 (approx.)



Mission Zanja Flood Control Channel - Mile Post 5.9 (approx.)

Exhibit D3. Channel Cross-Sections and OHWM

APPENDIX E

USACE Aquatic Resources Spreadsheet

Waters_Name	Cowadin_Code	HGM_Code	Measurement_Type	Amount	Units	Waters_Types	Latitude	Longitude	Local_Waterway
NJD A1	U	slope	area	0.048392	ACRE	UPLAND	34.099703	-117.295621	unnamed
NJD A2	U	slope	area	0.011677	ACRE	UPLAND	34.099806	-117.292691	unnamed
NJD A3	U	slope	area	0.013096	ACRE	UPLAND	34.099848	-117.290939	unnamed
NJD B	U	slope	area	0.246098	ACRE	UPLAND	34.073846	-117.266153	unnamed
NJD C	U	slope	area	0.528106	ACRE	UPLAND	34.073632	-117.197716	unnamed
NJD D	U	slope	area	0.007323	ACRE	UPLAND	34.07023	-117.242046	unnamed
NJD E	U	slope	area	0.05148	ACRE	UPLAND	34.066212	-117.23545	unnamed
NJD F	U	slope	area	0.013934	ACRE	UPLAND	34.066208	-117.217928	unnamed
NJD G1	U	slope	area	0.11483843	ACRE	UPLAND	34.065019	-117.213966	unnamed
NJD G2	U	slope	area	0.007579	ACRE	UPLAND	34.064637	-117.212573	unnamed
NJD H1	U	slope	area	0.003383	ACRE	UPLAND	34.062977	-117.206985	unnamed
NJD H2	U	slope	area	0.003249	ACRE	UPLAND	34.062963	-117.206607	unnamed
NJD I1	U	slope	area	0.013048	ACRE	UPLAND	34.062764	-117.206414	unnamed
NJD I2	U	slope	area	0.164952	ACRE	UPLAND	34.062744	-117.203894	unnamed
NJD I3	U	slope	area	0.018452	ACRE	UPLAND	34.061539	-117.20145	unnamed
NJD I4	U	slope	area	0.053115	ACRE	UPLAND	34.060911	-117.199357	unnamed
NJD J1	U	slope	area	0.050988	ACRE	UPLAND	34.060267	-117.19636	unnamed
NJD J2	U	slope	area	0.02093	ACRE	UPLAND	34.059329	-117.192981	unnamed
Mill Creek Zanja	R4SB3	riverine	area	0.54576129	ACRE	RPW	34.058978	-117.172128	Mill Creek Zanja
Mission Zanja Flood Control Channel	R4SB3	riverine	area	8.64491012	ACRE	RPW	34.073778	-117.194519	Mission Zanja Flood Control Channel
Santa Ana River	R4SB4	riverine	area	5.135647	ACRE	RPW	34.075837	-117.270306	Santa Ana River
Twin Creek	R4SB (Concrete)	riverine	area	2.0674	ACRE	RPW	34.090557	-117.283157	Twin Creek
Warm Creek (Historic)	R4SB	riverine	area	0.349912	ACRE	RPW	34.099875	-117.2906	Warm Creek (Historic)
IW1	U	depessional	area	0.081629	ACRE	ISOLATE	34.073648	-117.26453	unnamed
Twin Creek Wetland	R4SB7	riverine	area	0.046208	ACRE	RPWWD	34.0905	-117.283226	Twin Creek
							8.644910119		

APPENDIX F

Non-Jurisdictional Attribute Data

Non-Jurisdictional Drainage Information											
							Surface Runoff				
Non-Jurisdictional Drainages	Map Page	Surface / Subsurface Connectivity (Y/N)	Typical Flow Regime	Channel Type	Water Type (Uplands or Natural Drainage)	Percent Developed	Sheet-Flow Inputs	Dry Weather Urban Runoff Inputs	Upstream Natural Water Runoff Inputs	Drainage Area (Acres)	Discahrge Point
NJD A1	5A	No	Seasonal	Earthen Ditch - See Photo (F1)	Uplands - See Figure F1	< 15%	Yes	Yes	No	4.4	Storm Drain
NJD A2	5A	No	Seasonal	Earthen Ditch - See Photo (F2)	Uplands - See Figure F1	76%	Yes	Yes	No	32.9	Storm Drain
NJD A3	5A	No	Seasonal	Concrete Spillway- See Photo (F3)	Uplands - See Figure F1	76%	Yes	Yes	No	4.3	Spillway
NJD B	5G	No	Seasonal	Earthen Ditch - See Photo (F4)	Uplands - See Figure F2	76%	Yes	Yes	No	5.0	Enclosed Basin
IW1	5H	No	Perenial	Isolated Wetland - See Photo (F5)	Uplands - See Figure F2	76%	Yes	Yes	No	2.1	Enclosed Basin
NJD C	5I	No	Seasonal	Earthen Ditch - See Photo (F6)	Uplands - See Figure F2	85%	Yes	Yes	No	3.5	Storm Drain
NJD D	5K	No	Seasonal	Concrete Ditch - See Photo (F7)	Uplands - See Figure F3	76%	Yes	Yes	No	9.4	Storm Drain
NJD E	5L	No	Seasonal	Concrete Ditch - See Photo (F8)	Uplands - See Figure F3	76%	Yes	Yes	No	193.8	Storm Drain
NJD F	5N	No	Seasonal	Concrete Ditch - See Photo (F9)	Uplands - See Figure F3	76%	Yes	Yes	No	142.4	Storm Drain
NJD G1	5N	No	Seasonal	Earthen Ditch - See Photo (F10)	Uplands - See Figure F3	76%	Yes	Yes	No	10.0	Storm Drain
NJD G2	5N	No	Seasonal	Earthen Ditch - See Photo (F11)	Uplands - See Figure F3	76%	Yes	Yes	No	9.2	Storm Drain
NJD H1	5O	No	Seasonal	Earthen Ditch - See Photo (F12)	Uplands - See Figure F3	76%	Yes	Yes	No	0.5	Storm Drain
NJD H2	5O	No	Seasonal	Earthen Ditch - See Photo (F13)	Uplands - See Figure F3	76%	Yes	Yes	No	23.6	Storm Drain
NJD I1	5O	No	Seasonal	Earthen Ditch - See Photo (F14)	Uplands - See Figure F3	65%	Yes	Yes	No	32.2	Storm Drain
NJD I2	5O	No	Seasonal	Concrete Ditch - See Photo (F15)	Uplands - See Figure F3	53%	Yes	Yes	No	29.4	Storm Drain
NJD I3	5P	No	Seasonal	Earthen Ditch - See Photo (F16)	Uplands - See Figure F3	90%	Yes	Yes	No	28	Storm Drain
NJD I4	5P	No	Seasonal	Earthen Ditch - See Photo (F17)	Uplands - See Figure F3	15%	Yes	Yes	No	0.4	Storm Drain
NJD J1	5P	No	Seasonal	Earthen Ditch - See Photo (F18)	Uplands - See Figure F3	23%	Yes	Yes	No	41.6	Storm Drain
NJD J2	5P/Q	No	Seasonal	Earthen Ditch - See Photo (F19)	Uplands - See Figure F3	41%	Yes	Yes	Yes	6.2	Storm Drain


NJD A1


NJD A2


DANGER
NJD A3


NJD B


IW1


Worldwide Services
NJD C


NJD D


NJD E


NJD F


NJD G1


NJD G2


NJD H1


NJD H2


NJD I1


NJD I2


DYNASTY
SUITES
NJD I3


NJD I4


NJD J1


NJD J2

APPENDIX M

Site Photographs

APPENDIX M

Site Photographs

Photograph 1. Representative view of the disturbed habitat along the ROW.

Photograph 2. View of Twin Creek looking to the southwest.
Soil pit #3 is on north side of creek and soil pit #4 is on the south side.
The soil pit areas are disturbed wetland.

Photograph 3. View of eucalyptus woodland habitat along the southwestern side of the Santa Ana River.

Photograph 4. Mission Zanja Creek flowing into Santa Ana River. Disturbed habitat in the foreground and southern willow scrub habitat in the background. Northerly view.

Photograph 5. Northerly view of Warm Creek a non-vegetated channel.

Photograph 6. View of oak woodland looking north.

Photograph 7. Southern willow scrub looking easterly.

Photograph 8. Representative view of urban/developed habitat.

Photograph 9. Southeast side overflow of Santa Ana River. Northerly view.

Photograph 10. Northerly view of Mission Zanja Creek.

Photograph 11. Mill Creek Zanja. Northwesterly view.

Photograph 12. Non-jurisdictional feature.

Photograph 13. Soil pit #1.

Photograph 14. Overview of soil pit #1 location.

Photograph 15. Overview of soil pit #2 location.

Photograph 16. Manufactured earthen berm separating the storm water runoff (soil pits #1 and #2) from Zanja Channel.

Photograph 17. North side of Twin Creek. Location of soil pit #3.

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APPENDIX N

CNDDB Results

Summary Table Report

California Department of Fish and Game

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Accipiter cooperii Cooper's hawk	G5 S3	None None	DFG_WL-Watch List IUCN_LC-Least Concern	1,460 1,460	102 S:1	0	0	0	0	0	1	0	1	1	0	0
Anniella pulchra pulchra silvery legless lizard	G3G4T3T4Q S3	None None	DFG_SSC-Species of Special Concern USFS_S-Sensitive	1,515 2,110	91 S:3	0	1	0	2	0	0	0	3	3	0	0
Antrozous pallidus pallid bat	G5 S3	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	1,360 1,360	402 S:1	0	0	0	0	0	1	1	0	1	0	0
Arenaria paludicola marsh sandwort	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,000 1,000	15 S:1	0	0	0	0	1	0	1	0	0	0	1
Aspidoscelis hyperythra orangethroat whiptail	G5 S2	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern	1,500 1,600	339 S:3	0	0	1	0	0	2	3	0	3	0	0
Aspidoscelis tigris stejnegeri coastal whiptail	G5T3T4 S2S3	None None		1,060 1,060	112 S:1	0	0	0	0	0	1	0	1	1	0	0
Astragalus hornii var. hornii Horn's milk-vetch	G4G5T2T3 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	1,000 1,000	14 S:1	0	0	0	0	1	0	1	0	0	0	1
Athene cunicularia burrowing owl	G4 S2	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,090 1,170	1808 S:4	0	2	0	0	0	2	1	3	4	0	0
Berberis nevinii Nevin's barberry	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,500 1,600	34 S:3	0	0	1	1	0	1	2	1	3	0	0
Calochortus plummerae Plummer's mariposa-lily	G3 S3	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	1,500 1,500	232 S:1	0	0	0	0	0	1	0	1	1	0	0
Carex comosa bristly sedge	G5 S2	None None	Rare Plant Rank - 2.1	1,000 1,000	29 S:1	0	0	0	0	1	0	1	0	0	1	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Carolella busckana Busck's gallmoth	G1G3 SH	None None		1,160 1,160	4 S:1	0	0	0	0	1	0	1	0	0	0	1
Catostomus santaanae Santa Ana sucker	G1 S1	Threatened None	AFS_TH-Threatened DFG_SSC-Species of Special Concern IUCN_VU-Vulnerable	838 880	27 S:2	0	0	1	0	0	1	0	2	2	0	0
Caulanthus simulans Payson's jewel-flower	G3 S3.2	None None	Rare Plant Rank - 4.2 USFS_S-Sensitive	2,000 2,000	39 S:1	0	0	0	0	0	1	1	0	1	0	0
Centromadia pungens ssp. laevis smooth tarplant	G3G4T2 S2.1	None None	Rare Plant Rank - 1B.1	1,000 1,050	81 S:2	0	0	0	0	0	2	1	1	2	0	0
Chaetodipus fallax fallax northwestern San Diego pocket mouse	G5T3 S2S3	None None	DFG_SSC-Species of Special Concern	1,150 2,100	88 S:10	0	1	2	1	0	6	0	10	10	0	0
Chloropyron maritimum ssp. maritimum salt marsh bird's-beak	G4?T2 S2.1	Endangered Endangered	Rare Plant Rank - 1B.2	1,000 1,000	29 S:1	0	0	0	0	1	0	1	0	0	1	0
Chorizanthe parryi var. parryi Parry's spineflower	G3T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive USFS_S-Sensitive	1,000 1,650	94 S:9	0	0	0	0	1	8	7	2	8	1	0
Coccyzus americanus occidentalis western yellow-billed cuckoo	G5T3Q S1	Candidate Endangered	BLM_S-Sensitive USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	1,000 1,000	117 S:1	0	0	0	0	1	0	1	0	0	1	0
Crotalus ruber red-diamond rattlesnake	G4 S2?	None None	DFG_SSC-Species of Special Concern	1,800 1,800	115 S:1	0	0	0	0	0	1	1	0	1	0	0
Cuscuta obtusiflora var. glandulosa Peruvian dodder	G5T4T5 SH	None None	Rare Plant Rank - 2.2		6 S:1	0	0	0	0	1	0	1	0	0	0	1
Dendroica petechia brewsteri yellow warbler	G5T3? S2	None None	DFG_SSC-Species of Special Concern USFWS_BCC-Birds of Conservation Concern	1,460 1,460	48 S:1	0	0	0	0	0	1	0	1	1	0	0
Dipodomys merriami parvus San Bernardino kangaroo rat	G5T1 S1	Endangered None	DFG_SSC-Species of Special Concern	1,030 1,550	47 S:15	2	0	4	2	1	6	2	13	14	1	0
Dipodomys stephensi Stephens' kangaroo rat	G2 S2	Endangered Threatened	IUCN_EN-Endangered	1,320 1,750	214 S:4	0	0	1	1	2	0	4	0	2	0	2
Dodecahema leptoceras slender-horned spineflower	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,100 2,200	35 S:8	0	1	1	0	2	4	4	4	6	1	1

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Empidonax traillii extimus southwestern willow flycatcher	G5T1T2 S1	Endangered Endangered	ABC_WLBCC-Watch List of Birds of Conservation Concern	1,460 1,460	62 S:1	0	0	0	0	0	1	0	1	1	0	0
Eremophila alpestris actia California horned lark	G5T3Q S3	None None	DFG_WL-Watch List IUCN_LC-Least Concern	1,100 1,100	76 S:1	0	0	1	0	0	0	0	1	1	0	0
Eriastrum densifolium ssp. sanctorum Santa Ana River woollystar	G4T1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 USFS_S-Sensitive	840 1,476	23 S:10	0	0	6	3	0	1	1	9	10	0	0
Eumops perotis californicus western mastiff bat	G5T4 S3?	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern WBWG_H-High Priority	1,380 1,380	293 S:3	0	0	0	1	0	2	2	1	3	0	0
Galium californicum ssp. primum Alvin Meadow bedstraw	G5T1Q S1	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	1,180 1,180	4 S:1	0	0	0	0	0	1	1	0	1	0	0
Gila orcuttii arroyo chub	G2 S2	None None	AFS_VU-Vulnerable DFG_SSC-Species of Special Concern USFS_S-Sensitive	838 880	49 S:2	0	0	1	1	0	0	0	2	2	0	0
Helianthus nuttallii ssp. parishii Los Angeles sunflower	G5TH SH	None None	Rare Plant Rank - 1A USFS_S-Sensitive	1,000 1,000	8 S:1	0	0	0	0	1	0	1	0	0	1	0
Horkelia cuneata ssp. puberula mesa horkelia	G4T2 S2.1	None None	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,100 1,100	58 S:1	0	0	0	0	1	0	1	0	0	1	0
Icteria virens yellow-breasted chat	G5 S3	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern	1,460 1,460	84 S:1	0	0	0	0	0	1	0	1	1	0	0
Imperata brevifolia California satintail	G2 S2.1	None None	Rare Plant Rank - 2.1 USFS_S-Sensitive	1,100 1,100	29 S:2	0	0	0	0	1	1	2	0	1	1	0
Lanius ludovicianus loggerhead shrike	G4 S4	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,460 1,460	79 S:1	0	0	0	0	0	1	0	1	1	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Lasiurus xanthinus western yellow bat	G5 S3	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_H-High Priority	1,050 1,400	57 S:4	0	0	0	0	0	4	1	3	4	0	0
Lepidium virginicum var. robinsonii Robinson's pepper-grass	G5T2? S2.2	None None	Rare Plant Rank - 1B.2	1,450 1,800	53 S:3	0	0	0	0	0	3	3	0	3	0	0
Lepus californicus bennettii San Diego black-tailed jackrabbit	G5T3? S3?	None None	DFG_SSC-Species of Special Concern	1,060 1,060	96 S:1	0	0	0	0	0	1	0	1	1	0	0
Lycium parishii Parish's desert-thorn	G3? S2S3	None None	Rare Plant Rank - 2.3	1,600 1,600	4 S:1	0	0	0	0	1	0	1	0	0	0	1
Malacothamnus parishii Parish's bush-mallow	GHQ SH	None None	Rare Plant Rank - 1A	1,290 1,290	1 S:1	0	0	0	0	0	1	1	0	1	0	0
Monardella pringlei Pringle's monardella	GX SX	None None	Rare Plant Rank - 1A	1,000 1,000	2 S:1	0	0	0	0	0	1	1	0	1	0	0
Nasturtium gambelii Gambel's water cress	G1 S1	Endangered Threatened	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,000 1,000	12 S:1	0	0	0	0	1	0	1	0	0	0	1
Neotoma lepida intermedia San Diego desert woodrat	G5T3? S3?	None None	DFG_SSC-Species of Special Concern	1,200 1,560	115 S:2	0	1	1	0	0	0	0	2	2	0	0
Nyctinomops femorosaccus pocketed free-tailed bat	G4 S2S3	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_M-Medium Priority	1,200 1,200	90 S:1	0	0	0	0	0	1	1	0	1	0	0
Onychomys torridus ramona southern grasshopper mouse	G5T3? S3?	None None	DFG_SSC-Species of Special Concern	1,180 1,180	26 S:1	0	0	0	0	0	1	1	0	1	0	0
Perognathus longimembris brevinasus Los Angeles pocket mouse	G5T1T2 S1S2	None None	DFG_SSC-Species of Special Concern USFS_S-Sensitive	1,000 1,300	49 S:6	1	0	1	0	0	4	2	4	6	0	0
Phrynosoma blainvillii coast horned lizard	G4G5 S3S4	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	1,000 1,400	658 S:4	0	0	0	0	1	3	4	0	3	0	1

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Polioptila californica californica coastal California gnatcatcher	G3T2 S2	Threatened None	ABC_WLBCC-Watch List of Birds of Conservation Concern DFG_SSC-Species of Special Concern	1,100 1,620	800 S:6	0	2	0	0	0	4	2	4	6	0	0
Rana muscosa Sierra Madre yellow-legged frog	G1 S1	Endangered Candidate Endangered	DFG_SSC-Species of Special Concern IUCN_EN-Endangered USFS_S-Sensitive	1,800 1,800	165 S:1	0	0	0	0	1	0	1	0	0	0	1
Rhaphiomidas terminatus abdominalis Delhi Sands flower-loving fly	G1T1 S1	Endangered None		1,000 1,180	13 S:6	0	1	3	0	1	1	0	6	5	1	0
Rhinichthys osculus ssp. 3 Santa Ana speckled dace	G5T1 S1	None None	AFS_TH-Threatened DFG_SSC-Species of Special Concern USFS_S-Sensitive	1,600 1,600	14 S:1	0	1	0	0	0	0	0	1	1	0	0
Ribes divaricatum var. parishii Parish's gooseberry	G4TH SH	None None	Rare Plant Rank - 1A	1,000 1,000	4 S:1	0	0	0	0	1	0	1	0	0	1	0
Riversidian Alluvial Fan Sage Scrub Riversidian Alluvial Fan Sage Scrub	G1 S1.1	None None		1,500 2,000	30 S:2	0	1	1	0	0	0	2	0	2	0	0
Sidalcea neomexicana Salt Spring checkerbloom	G4? S2S3	None None	Rare Plant Rank - 2.2	1,050 1,050	15 S:1	0	0	0	0	0	1	1	0	1	0	0
Southern Coast Live Oak Riparian Forest Southern Coast Live Oak Riparian Forest	G4 S4	None None		1,780 1,780	246 S:1	0	0	0	0	0	1	1	0	1	0	0
Southern Cottonwood Willow Riparian Forest Southern Cottonwood Willow Riparian Forest	G3 S3.2	None None		860 860	111 S:1	0	0	0	0	0	1	1	0	1	0	0
Southern Riparian Scrub Southern Riparian Scrub	G3 S3.2	None None		1,360 1,360	56 S:1	0	0	0	0	0	1	1	0	1	0	0
Southern Sycamore Alder Riparian Woodland Southern Sycamore Alder Riparian Woodland	G4 S4	None None		1,100 1,640	230 S:3	0	0	0	0	0	3	3	0	3	0	0
Sphenopholis obtusata prairie wedge grass	G5 S2.2	None None	Rare Plant Rank - 2.2	800 1,000	19 S:2	0	0	0	0	0	2	2	0	2	0	0

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Summary Table Report

California Department of Fish and Game

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Symphyotrichum defoliatum San Bernardino aster	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive		76 S:1	0	0	0	0	1	0	1	0	0	0	1
Taxidea taxus American badger	G5 S4	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern	1,040 1,600	454 S:2	0	0	0	0	0	2	2	0	2	0	0
Vireo bellii pusillus least Bell's vireo	G5T2 S2	Endangered Endangered	ABC_WLBCC-Watch List of Birds of Conservation Concern IUCN_NT-Near Threatened	790 1,460	232 S:4	0	1	2	0	0	1	0	4	4	0	0

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Information Expires 7/3/2012

Revised Final Jurisdictional Wetland Delineation Report

Redlands Passenger Rail Project

Redlands, San Bernardino County, California

July 2013

Prepared for:

San Bernardino Associated Governments
1170 W. 3rd Street, 2nd Floor
San Bernardino, California 92410

Prepared by:

HDR Engineering, Inc.
8690 Balboa Avenue, Suite 200
San Diego, California 92123

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1.0 INTRODUCTION AND PROJECT DESCRIPTION

This report summarizes preliminary findings of the U.S. Army Corps of Engineers (USACE) and California Department of Fish and Wildlife (CDFW) jurisdiction for the Redlands Passenger Rail Project (RPRP or project) located in Redlands, San Bernardino County, California. [1] In 2012, HDR biologists examined the project site and a surrounding buffer area to determine the limits of: (1) USACE jurisdiction pursuant to Section 404 of the Clean Water Act (CWA); and (2) CDFW jurisdiction pursuant to Section 1600 of the California Fish and Game Code. Appendix A, Figure 1 depicts the project location. Appendix A, Figure 2 depicts the project study area overlaid on USGS San Bernardino South and Redlands quadrangles. Appendix A, Figure 3 depicts soils within the project study area. Appendix A - Figures 4a-4t, depict the vegetation communities and cover types that occur within the project study area. Appendix A - Figures 5a-5t depict the location and extent of Waters of the U.S. and Waters of the State.

Should project construction result in measurable impacts to USACE or CDFW jurisdiction, one or more of the following permitting documents may be required, depending on jurisdictional determinations (JD) made by the regulatory authorities identified by this study:

- A USACE Individual Permit pursuant to Section 404 of the federal CWA (1990, as amended), and/or qualification under a Nationwide Permit pursuant to Section 404 of the CWA;
- CWA Section 401 Certification from the state Regional Water Quality Control Board (RWQCB); and
- California Fish and Game Code Section 1602 Streambed alteration Agreement (CDFW).

1.1 PROJECT APPLICANT

The San Bernardino Associated Governments (SANBAG) is proposing the Project as further described under Section 1.2 to facilitate passenger rail service along the Redlands Corridor. SANBAG would be the project applicant for any regulatory permit approvals that may be required for the Project. The primary contact person at SANBAG for the Project is provided below.

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1.2 PROJECT DESCRIPTION

The Project would involve the implementation rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. Appendix A, Figure 1 depicts the project location. The five station stops proposed in conjunction with the RPRP would be located at E Street and Tippecanoe Avenue within the City of San Bernardino and New York Street, Orange Street, and University Street within the City of Redlands.

[1] This report presents our best effort at estimating the subject jurisdictional boundaries using the most up-to-date regulations and written policy and guidance from the regulatory agencies. Only the regulatory agencies can make a final determination of jurisdictional boundaries. If a final jurisdictional determination is required, HDR can assist in getting written confirmation of jurisdictional boundaries from the agencies.

Maintenance activities would be performed at a new layover facility proposed west of California Street and south of I-10 in the City of Redlands, just north of the Loma Linda city limits.

Construction of the project would occur within an existing railroad right-of-way (ROW) owned by the San Bernardino Associated Governments (SANBAG). SANBAG's ROW averages 50 to 100 feet in width with the exception of portions of downtown Redlands where the ROW measures less than 40 feet. Additional details regarding each of the components comprising the Project and associated operations are described under the following subheadings.

Track Improvements

The Project would include the construction of track improvements to facilitate train movements along a single track through the rail corridor with an approximately 10,000-foot-long section of passing track or siding, from just west of Richardson Street to just east of California Street (Mile Post [MP] 5.5 to MP 7.4). The proposed track ballast and sub-grade along the 9-mile project corridor would be constructed to 50 feet in width, sufficient to support a parallel maintenance road. In downtown Redlands, this width would be reduced to less than 40 feet in recognition of the constrained ROW. This would require demolition and replacement of the existing track. These improvements would generally adhere to standards established by the BNSF and Southern California Regional Railroad Authority (SCRRA) for the rail, rail ties, ballast and subballast materials, grade crossing panels, placement of drainage structures and retaining walls, and horizontal and vertical clearances. The rail improvements would also include the construction of a new train signaling and communications system.

Structural Crossings and Bridges

The Project would require the replacement or retrofitting of up to six structural crossings to facilitate the loading requirements of the passenger trains and track foundation. Five of the six structural crossings consist of existing bridge structures at Warm Creek (Historic), Twin Creek, Santa Ana River (Upper), the Mission Zanja Flood Control Channel, and Mill Creek Zanja.

Roadway Grade Crossings

The Study Area traverses 32 existing roadway grade crossings including two I-10 underpasses. Roadways grade crossing not subject to closure would be re-designed in accordance with the latest Grade Crossing Design guidelines that require in certain cases raised medians, widened sidewalks, traffic striping, flashing lights, pedestrian gate arms where requested by the California Public Utilities Commission (CPUC), and swing gates.

Proposed Rail Platforms

There are currently five (5) station stops proposed for the Project with new rail platforms proposed at four (4) locations. Two (2) station stops (E Street and Tippecanoe Avenue) would be located in the City of San Bernardino, while the other three (3) (New York Street, Downtown Redlands, and the University of Redlands) would be located in the City of Redlands. Shade structures (or canopies) would be provided to individually distinguish each rail platform and to compliment the contextual surroundings. Landscape planters would be used to separate platforms from open areas, adjacent uses, and walkways.

Train Layover Facility

The Project would require the development of a new Train Layover Facility to include sufficient storage tracks for maintenance activities and operational activities including offices, training rooms, and a crew break room. The Train Layover Facility would be constructed on a long narrow site immediately south of I-10 and west of California Street and would contain up to seven spur tracks.

Utility Replacement and Relocation

The Project would likely necessitate the relocation of existing subsurface and overhead crossing utilities (i.e., water, sewer, storm drain, power, gas, fiber optic, and telephone lines) in accordance with applicable utility accommodation design criteria and engineering standards. The exact method of improvement, if required, would be determined in coordination with the affected utility provider in conjunction with the Project's final design.

Drainage

Several drainage facility improvements would be necessary to accommodate the track improvements, bridge replacements, platform improvements, and layover facility. It is anticipated that a majority of the storm drain facilities would be protected in place and would not need to be lowered to meet minimum depth requirements. However, it is likely that the majority of the storm drain casings within the rail ROW would need to be extended to span the entire width of the rail ROW. These improvements would be coordinated with the cities of San Bernardino and Redlands along with San Bernardino County Flood Control District (SBCFCD). In addition, longitudinal storm drain lines located within the rail corridor would need to be relocated further from the proposed track centerlines to comply with BNSF engineering standards.

Mission Zanja Channel Improvements. Mission Zanja Flood Control Channel runs parallel to the rail line from the SAR to approximately 900 feet west of California Street for a distance of approximately 2.6 miles where it diverges from the Survey Area to the south. At approximately milepost 9.4 (Bridge 9.4), the creek rejoins the railroad further east, as Mill Creek Zanja , where it passes under the railroad just west of the I-10 overcrossing.

Mission Zanja Channel is characterized as an improved, trapezoidal earthen channel with some segments including wire revetment (USACE, 1994). To ensure the structural integrity of the track improvements along sections of Mission Zanja Channel, the Project may include bank stabilization improvements (e.g. armoring, slope keying, etc.) to the northern bank of the Mission Zanja Channel, from MP 3.5 to just east of MP 6, to ensure that the bank is able to support the additional loading requirements and withstand scour during high flow events. At this time, SANBAG is considering the use of an articulated concrete block (ACB) to support the armoring of the northern bank, which would allow for the growth of limited vegetation. This improvement would be coordinated and constructed with the SBCFCD, which owns and maintains the Mission Zanja Channel.

Description of Passenger Rail Operations

The Project would incorporate the use of previously owned rail commuter rail vehicles and would start operations in early 2018. Local service would operate between the E Street and University of Redlands Rail Platforms with stops at each of the station stops along the route. Trains would operate every 30 minutes in the peak periods and every hour in the off-peak period. This would translate to 25 average

daily round trips along the alignment during weekdays. The Project does not propose any corresponding increase is freight service.

Maintenance

Maintenance of the railroad ROW is currently the responsibility of BNSF, which is the current operator of the rail line. This includes routine maintenance of the track and track ties, grade crossings, and communication system. Vegetation management and weed abatement would also be required along the ROW. Each platform would also require routine landscaping and facility maintenance (e.g. replacement of lighting fixtures). Typical railroad maintenance and inspections would be conducted by a contractor hired by SANBAG throughout the operational phase of the Project in accordance with SCRRA/Metrolink and BNSF standard practices.

Construction

Construction of the proposed Project would begin in 2015 and take up to 36 months to complete. Construction would proceed generally from the west of E Street to the SAR and similarly from the SAR east to Cook Street. Construction scheduling and phasing would ultimately be at the discretion of SANBAG's contractor. In total, the anticipated construction disturbance area is estimated at 140.59 acres; however, actual physical disturbance would generally be limited to 10 acres or less on any given day. Of this total disturbance area, approximately 34.35 acres would be limited to temporary, construction-related impacts associated with the bridge structures and staging areas, while approximately 106.24 acres would be permanently impacted by the placement of one or more Project facilities.

A description of anticipated construction activities over the course of Project construction is provided as follows:

- Construction easement acquisition, clearing and grubbing, and removal of existing track;
- Relocate, extend, or encase utilities, as appropriate, to remove conflicts;
- Construct embankments, culvert extensions, an retaining walls for the proposed rail corridor, as necessary;
- Re-grade, install drainage, and construct bridge crossings, including as appropriate, new, standard height parapets on both sides of each bridge, construct in-fill walls, plug deck drains, construct new spread footings at each pile, and seal parapet joints;
- Construct new rail platforms at proposed rail platform locations and layover facility; and
- Construct new continuous welded rail track, roadway grade crossings, and install pedestrian access improvements and landscaping, where appropriate.

These activities would likely overlap at times. Staging areas for construction equipment and materials would be located primarily within the SANBAG ROW to the extent feasible. Other staging areas would be acquired, as necessary, by the construction contractor and, to the extent feasible, would include vacated roadway ROW. The location of the staging areas would depend on the rail segment, bridge, and platform location being constructed. In addition, a part of the proposed layover facility would be used as a centralized construction staging area for heavy equipment due to its centralized location along the rail corridor.

1.2.1 Alternatives and Design Options

In conjunction with the environmental review for RPRP, SANBAG is considering several alternatives and design options for the project. The alternatives and design options evaluated in this BTR are identified and summarized below:

- *Reduced Project Footprint Alternative*. This alternative would involve a reduced construction area (130.6 acres) to minimize impacts to sensitive habitats. These reductions in the construction area occur at Twin Creek, the SAR, and along the Mission Zanja Flood Control Channel. Additionally, this alternative would include an alternate bridge design for Bridge 3.4 to further minimize permanent impacts to the SAR as a result of the placement of the new bridge pier foundations. All other aspects of this alternative would be similar to the Preferred Project.
- *Design Option 1 (Layover at Waterman Avenue)*. Design Option 1 would entail the placement of the proposed layover facility at an alternative location, just east of Waterman Avenue and north of the railroad corridor. The total construction area under the design option would slightly increase to 143.6 acres. All other aspects of this design option would be similar to the Preferred Project.
- *Design Options 2 (Use of Existing Layover Facilities)*. Design Option 2 would entail the use of existing layover facilities to the west of the Survey Area in place of constructing a new layover facility. The total construction area under the design option would decrease to 130.0 acres. All other aspects of this design option would be similar to the Preferred Project.
- *Design Option 3 (Waterman Station)*. Design Option 3 would entail the construction of a new station platform just east of Waterman Avenue and south of the railroad corridor in place of the Tippecanoe Avenue platform. The total construction area under the design option would slightly increase to 139.5 acres. All other aspects of this design option would be similar to the Preferred Project.

Additionally, a No Build Alternative is under consideration as part of the environmental review. Under this alternative, SANBAG would not construction the project, but would still be required to perform regularly scheduled maintenance of the existing track and corresponding improvements at grade crossings and bridges to facilitate continued freight service per SANBAG's obligations with BNSF. As a result, the some renovation and rehabilitation of the railroad corridor would still be required. However, these improvements would not be performed immediately, but rather incrementally over the next 10 years.

1.2.2 Definitions

The following definitions are used to describe the location of the various survey activities conducted during on-site fieldwork:

- ***Project area*** is defined as the limits of impacts associated with full build-out of the proposed project. The proposed project footprint is approximately 143 acres.
- ***Survey area*** is defined as the area within 200 feet on either side of the centerline of the proposed track alignment that was mapped and evaluated for potential direct and indirect impacts to biological resources. In limited areas, the survey area extends beyond the 200-foot offset to cover adjacent project facilities or potential infrastructure improvements. The survey area for the project is approximately 534 acres.

1.3 PROJECT LOCATION

The project is located within the limits of the Cities of San Bernardino and Redlands within the County of San Bernardino, California (Figure 1). The Survey area includes the easternmost nine miles of the 10-mile long Redlands Subdivision, which is now under SANBAG ownership. The Survey area starts just west of Mile Post (MP) 1, east of E Street within the City of San Bernardino and ends at MP 10.1 at the University of Redlands. The western endpoint of the Survey area roughly corresponds with 472625.405003 meters (m) East and 3773265.404 m North (WGS 84 UTM 11N). The eastern end of the Survey area corresponds with 485190.263559 m East and 3768624.11534 m North (WGS 84 UTM 11N).

Five major water crossings occur along within the Survey area. The western-most water crossing occurs at Warm Creek (Historic) at approximately MP 1.1. Further east, the railroad corridor crosses Twin Creek at approximately MP 2.2. At MP 3.4, the railroad corridor crosses the Santa Ana River. East of the Santa Ana River, the Survey area parallels the Mission Zanja Flood Control Channel for approximately 2.6 miles (MP 3.4 to MP 6.0). At MP 5.78, the Bryn Mawr Avenue crosses the Mission Zanja Flood Control Channel and intersections with the railroad corridor. Further east, the railroad corridor crosses the Mill Creek Zanja at MP 9.4.

1.4 SOILS

The Survey area is characterized as an alluvium-filled valley that formed over crystalline bedrock. The resulting surface generally ranges from 1,078 feet mean sea level (msl) in downtown San Bernardino to 1,474 feet msl in downtown Redlands. Soils within the Survey area boundary were mapped using the Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2003). The proposed project crosses eight different soil types (Appendix A, Figure 3), including:

- ***Grangeville Fine Sandy Loam (Gr)*** – This nearly level soil occurs on alluvial fans and alluvial plains and is used for pasture, truck crops, tomatoes, and flowers. It is a poorly drained, very deep fine sandy loam derived from granitic alluvium. The available water holding capacity is 6 to 8.5 inches. Runoff is very slow, and the erosion hazard is slight. The elevation ranges from 50 to 200 feet.
- ***Tujunga Gravelly Loamy Sand (TvC), 0-9 percent slopes*** – This soil occurs on alluvial fans and flood plains and is used mainly for grazing. Tujunga series consists of very deep, somewhat excessively drained soils formed in alluvium weathered mostly from granitic sources. The soils formed in sandy alluvium derived mostly from granitic sources. Runoff is very low or negligible and permeability is rapid. The elevation ranges from 5 to 4,300 feet.
- ***Hanford Coarse Sandy Loam (HaC), 2-9 percent slopes*** – This soil occurs on stream bottoms, floodplains and alluvial fans and is used for growing a wide range of fruits, vegetables, and general farm crops. Hanford series consists of very deep, well drained soils that formed in moderately coarse textured alluvium dominantly from granite. Runoff is well drained or low and permeability is moderately rapid. The elevation ranges from 150 to 3,500 feet.
- ***Psamments and Fluvents, Frequently Flooded (Ps)*** – Psamment soils are sandy in all layers and are among the most productive rangeland soils. Psamments are used mostly as rangeland, pasture, or wildlife habitat. Fluvents are more the more or less freely drained Entisols that have formed in recent water-deposited sediments on flood plains, fans, and deltas along rivers and small streams. Fluvents are used as rangeland, forest, pasture, or wildlife habitat and sometimes used as cropland. Most fluvents are frequently flooded with normal stratification of materials unless they are protected by dams or levees.

- ***Tujunga Loamy Sand (TvB), 0-5 percent slope –*** This soil occurs in somewhat excessively drained soils formed in alluvium and is used for growing citrus, grapes and other fruits but mainly used for grazing. Tujunga series consists of mostly weathered granitic sources. Runoff is very low to negligible with rapid permeability. The elevation ranges from 5-4,300 feet.
- ***Grangeville Fine Sandy Loam, Saline-Alkali (Gs) –*** This nearly level soil occurs on alluvial fans and alluvial plains and is used for pasture, truck crops, tomatoes, and flowers. It is a poorly drained, very deep fine sandy loam derived from granitic alluvium. The available water holding capacity is 6 to 8.5 inches. Formerly, most areas of Grangeville soils were occasionally flooded. Runoff is negligible, with moderate permeability in saline-sodic phases. The elevation ranges from 50 to 200 feet.
- ***Hanford Sandy Loam (HbA), 0-2 percent slopes –*** This soil occurs on stream bottoms, floodplains and alluvial fans and is used mostly for growing a wide range of fruits, vegetables, and general farm crops. Hanford series consists of mostly granite and other quartz bearing rocks. Runoff is well drained, negligible to low runoff, and with moderately rapid permeability. The elevation ranges from 150-3,500 feet.
- ***Ramona Sandy Loam (RmC), 2-9 percent slopes –*** This soil occurs on terraces and fans and used mostly for production of grain, irrigated citrus and deciduous fruits. Ramona series consists of mostly granitic and related rock sources. Runoff is slow to rapid and permeability is moderately slow. The elevation ranges from 250-3,500 feet.

1.5 HYDROLOGY

The Study Area is located within the Santa Ana River Watershed[2], which is approximately 2,800 square miles in area, originates at San Gorgonio Peak in San Bernardino County and drains southwesterly through Riverside and Orange Counties prior to emptying into the Pacific Ocean at Newport Beach. The Study Area is located with the Upper Santa Ana River Watershed, which is hydraulically disconnected from the lower watershed by San Prado Dam. The Study Area corresponds with the Santa Ana River Wash (HUC 18070203507), Mission Zanja (HUC 180702030506), and the Warm Creek (HUC 180702030508) sub-watershed units.

A total of five major offsite drainage features either crosses or is located longitudinally to the rail corridor. The crossings from west to east are known as Warm Creek (Historic) [Bridge 1.1], Twin Creek [Bridge 2.2], the SAR [Bridge 3.4], Bryn Mawr Avenue [Bridge 5.78], and Mill Creek Zanja [Bridge 9.4]. Bridges 5.78 and 9.4 cross the Mission Zanja Flood Control Channel (Mission Zanja Channel), which is a major drainage channel located adjacent and to the south of the eastern segment of the rail corridor.

1.6 VEGETATION COMMUNITIES

Vegetation types or plant communities are assemblages of plant species that usually coexist in the same area. The classification of vegetation communities is based upon the life form of the dominant species within that community and the associated flora. Vegetation was classified using the R.F. Holland system of natural communities as described in Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986). Nomenclature follows Hickman (1993) and Roberts, et al. (2004). The survey area supports 14 distinct vegetation communities (Appendix A - Figures 4a-4t; Table 1); however, the predominant land cover was identified as being urban/developed. The majority of the survey area is

[2] Note the SAR Watershed is located within the South Coast Hydrologic Region and corresponds to Hydrologic Unit Code (HUC) 18070203 accordingly to the U.S. Geological Survey.

made up of paved roadways, man-made structures, adjacent lands that are un-vegetated, and landscaped parcels.

Disturbed Habitat (Holland Code 11300)

Disturbed habitat (DH) is primarily used to identify areas of severe impacts to natural communities to the extent where it is no longer sustaining or functioning naturally. These areas have been previously physically disturbed, but continue to retain a soil substrate. Disturbed areas consist of predominantly non-native weedy and ruderal exotic species. This is not a natural community and generally does not provide habitat for wildlife or sensitive species. Examples of disturbed habitat include areas that have been graded, cleared areas for fuel management, staging areas, off-road vehicle trails, and abandoned home sites.

Disturbed habitat in the survey corridor consists of abandoned staging areas, home sites, and parking areas, unpaved roads, and areas that have been graded, repeatedly cleared, and/or experienced repeated use that prevents natural revegetation (Appendix A, Figure 4a-4tAppendix B, Photograph 1). Characteristic species include invasive, non-native forbes, such as, prickly Russian-thistle/tumbleweed (*Salsola tragus*), London rocket (*Sisymbrium irio*), fennel (*Foeniculum vulgare*). In addition a limited amount of annual grasses typical of non-native grassland (42200) occur but do not dominate DH.

Table 1. Existing Vegetation within the Project Survey Area

Vegetation Communities	Survey Area Acreage
Disturbed Habitat	24.54
Disturbed Wetland	0.02
Eucalyptus Woodland	2.78
Flat-top Buckwheat Scrub (disturbed)	0.91
Mulefat Scrub	0.04
Non-Jurisdictional Ditch	1.31
Non-Native Grassland	61.90
Non-Vegetated Channel	29.22
Oak Woodland	9.62
Orchard and Vineyards	5.28
Southern Cottonwood Willow Riparian Forest	8.27
Southern Willow Scrub	0.64
Tamarisk Scrub	0.47
Urban/Developed	388.88
Total	**533.88**

Disturbed Wetland (Holland Code 11200)

Disturbed Wetland (DW) is generally associated with areas of wetlands that have been disturbed in the past by clearing, grubbing, or mowing. The vegetation community has indicators of wetland species that

have been disturbed and non-native species such as castor bean (*Ricinus communis*), giant reed grass (*Arundo donax*), pampas grass (*Cortaderia selloana*), and other invasive species.

Within the survey area, a small area of DW occurs along the northern portion of the streambed in Twin Creek just west of the existing railroad bridge. Vegetation is sparse and consists of young arroyo willows (*Salix lasiolepis*), mulefat (*Baccharis salicifolia*), Typha (*Typha* sp.), and water speedwell (*Veronica anagallis-aquatica*). Within the DW a significant amount of trash and debris has accumulated such as mattresses, clothing, and shopping carts (Appendix A, Figure 4d; Appendix B, Photographs 2 and 3). There is evidence of vegetation maintenance (i.e., mowing) within the streambed. The DW does not connect upstream or downstream to wetland habitats.

Eucalyptus Woodland (Holland Code 11100)

Eucalyptus woodland (EW) is characterized by landscaped areas around homes or roadways. The primary indicator in EW is eucalyptus (*Eucalyptus* spp.), which is a non-native tree species from Australia. The understory is sparse and mostly dominated by leaf litter and weedy species including brome grasses.

Within the survey area, EW occurs adjacent to the Santa Ana River with individuals and smaller stands of Eucalyptus occurring throughout the project alignment (Appendix A, Figures 4a-4t; Appendix B, Photograph 4).

Flat-top Buckwheat Scrub (Holland Code 37K00)

Flat-top buckwheat scrub (FBS) consists of a monoculture of successional vegetation that formally supported coastal sage scrub and chaparral in areas that experience continued disturbances. In the survey corridor this community is disturbed, however, it is dominated by flat-top buckwheat (*Eriogonum fasciculatum*) and Wright's buckwheat (*Eriogonum wrightii)*, with the presence of other species. Other species that were present include annual brome grasses, fescue (*Vulpia* spp.), filaree (*Erodium* spp.), deerweed (*Lotus scoparius*), white sage (*Salvia apiana*), and ranchers fiddleneck (*Amsinckia menziesii* var. *intermedia*).

Within the survey area, FBS occurs within a vacant lot located north of the railroad tracks adjacent to Warm Creek and east of D Street (Appendix A, Figures 4a-4t). This habitat is disturbed due to frequent mowing.

Mule fat Scrub (Holland Code 63310)

Mule fat scrub (MFS) is generally characterized by tall, herbaceous riparian scrub dominated by mule fat. This vegetation community is frequently flooded an absence of floods in this community would likely succeed to cottonwood- or sycamore-dominated riparian forest or woodlands. Within the survey area this habitat occurs primarily within the Santa Ana River (Appendix A, Figures 4a-4t).

Non-native Grassland (Holland Code 42200)

Non-native grasslands (NNG) are often associated with numerous species of wildflowers and a dense to sparse cover of annual grasses. Characteristic plant species of NNG include oat (*Avena* sp.), rip gut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), foxtail brome *(Bromus madritensis* ssp. *rubens),* four-spot clarkia *(Clarkia purpurea),* sierra shooting star (*Dodecatheon clevelandii*), and California melica (*Melica californica*).

NNG within the survey area is often disturbed and appears to have been previously irrigated and/or cultivated for agricultural purposes. Characteristics that comprise this attribute include the occurrence of previously open space between rows and these areas appear to be currently maintained (Appendix A, Figures 4a-4t).

Proposed Non-jurisdictional Ditch (No Holland Code)

Several non-jurisdictional ditches occur within the survey area. These ditches occur entirely within upland areas and are generally associated with the railroad ROW. These features are typically unvegetated, or vegetated with weedy ruderal species, and do not provide significant wildlife habitat. These features serve to drain road runoff from the ROW and are often connected through a series of culverts running parallel with the ROW (Appendix A, Figures 4a-4t).

Non-Vegetated Channel (Holland Code 13200)

Non-Vegetated Channel (NVC) consists primarily of engineered/leveed channels maintained by the San Bernardino Flood Control District or local municipality. The channels are either concrete-lined or consist of a fine to coarse sandy or sandy cobbly substrate and are sparsely vegetated or unvegetated. Leveed banks consist of either concrete, concrete-covered cobble, or rock rip rap. Within the survey area, FCC occurs primarily in Twin Creek, Warm Creek, the Santa Ana River, Zanja/Mission channel (Appendix A, Figures 4a-4t; Appendix B, Photographs 3 and 5).

Oak Woodland (Holland Code 71100)

Oak woodland (OW) consists primarily of monotypic stands or various species of oak (*Quercus* sp.) with a poorly developed shrub layer, and well developed herbaceous layer generally dominated by grasses (*Bromes* spp.).

In the survey area this vegetation community consists of uniformly distributed scrub oak species with an occasional live oak (*Quercus* spp.) and a disturbed understory made up of non-native grasses that appear to be maintained (Appendix A, Figures 4a-4t). The area provides little habitat value due to the amount of disturbance and the surrounding land uses.

Orchard and Vineyards (Holland Code 18100)

Orchard and Vineyards (OV) occurs as an active orange grove located north of the ROW between California and Nevada Streets (Appendix A, Figures 4a-4t).

Southern Cottonwood Willow Riparian Forest (Holland Code 61330)

Tall, open, broadleafed winter-deciduous riparian forests dominated by Fremont cottonwood (*Populus fremontii)* and several willow species (*Salix* spp). This habitat occurs in sub-irrigated and frequently overflowed lands along rivers and streams. The dominant species require moist, bare mineral soil for germination and establishment. The understory is generally vegetated by herbaceous and viney species such as sedges (*Carex* sp.), grape (*Vitis* sp.), and introduced wetland species.

Within the survey area, Southern cottonwood willow riparian forest (SCWRF) occurs primarily within the western portion of Mission Zanja Channel and within the Santa Ana River (Appendix A, Figures 4a-4t).

Southern Willow Scrub (Holland Code 63320)

Southern willow scrub (SWS) is usually made up of a dense thicket of various willow species (*Salix* spp.). This habitat occurs in loose, sandy alluvium near stream channels and is frequently flooded. The habitat is limited by the dense thicket of willows and frequent flooding which impacts the development of an understory.

Within the survey area, SWS occurs as small patches within the Santa Ana River and Twin Creek (Appendix A, Figures 4a-4t; Appendix B, Photographs 6-8).

Tamarisk Scrub (Holland Code 63810)

Tamarisk scrub (TS) is made up of almost a monoculture of any of several tamarisk (*Tamarix* spp.) species. This vegetation community is often associated with major disturbances in areas where native vegetation is being supplemented by tamarisk.

Within the survey area Tamarisk Scrub occurs in primarily within the Santa Ana River and the Zanja/Mission Channel (Appendix A, Figures 4h).

Urban/Developed (Holland Code 12000)

Urban/Developed (UD) land is comprised of areas of intensive use with much of the land constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. Developed land is highly modified and characterized by permanent or semi-permanent structures, pavement, unvegetated areas and landscaped areas that require irrigation.

Within the survey corridor, developed areas are comprised of paved roadways, man-made structures, adjacent lands that are unvegetated, or landscapes with a variety of ornamental (typically non-native/ exotic) plants (Appendix A, Figures 4a-4t; Appendix B, Photographs 9 and 10).

2.0 METHODS

Jurisdictional delineation surveys were conducted for the proposed project in 2012. The survey area was delineated by HDR Biologists Sean Harris and Allegra Simmons on February 7-8, and 22-23, 2012. As previously described, the survey area extends 200 feet from the project centerline to capture jurisdictional features within and adjacent to the proposed project footprint. HDR biologists examined the project area to determine the limits of: (1) USACE jurisdiction pursuant to Section 404 of the Clean Water Act (CWA); and (2) California Department of Fish and Wildlife (CDFW) jurisdiction pursuant to Section 1600-1616 of the California Fish and Game Code. The site was evaluated in accordance with the 1987 USACE Wetland Delineation Manual (Environmental Laboratory, 1987), the 1992 Classification of Wetlands and Deep Water Habitats in the United States (Cowardin et al., 1992), the 2008 Interim Regional Supplement to the USACE Wetland Delineation Manual: Arid West Supplement (Arid West Supplement) (USACE, 2008a), the Regulatory Program CWA Guidance to Implement the U.S. Supreme Court Decision for the Rapanos and Carabell Cases (USACE 2008b), and the Field Guide to the Identification of the Ordinary High Water Mark (OHWM) on the Arid West Region of the United States (USACE, 2008c).

Suspected jurisdictional areas were field checked for the presence of an OHWM, definable channels and/or wetland vegetation, soils and hydrology. Where distinct boundaries between wetland vegetation communities, those that are dominated by obligate species, and upland vegetation communities, those that

are dominated by facultative upland or upland species, occurred, wetland limits were based upon vegetation mapping. Where the presence of wetlands was suggested by either hydrophytic vegetation or indicators of hydrology, a soil pit was established. A total of four soil pits were dug between February 22-23, 2012.

While in the field jurisdictional limits were recorded onto a color aerial photograph using visible landmarks or by walking polylines with a Trimble GPS unit. Upon completion of fieldwork, all data collected in the field were incorporated into a Geographic Information System (GIS) along with basemap data. The GIS was then used to quantify the extent of jurisdictional areas (Appendix A, Figures 5a-5t). Other data were recorded onto wetland data sheets (attached as Appendix C), available topographic data (attached as Appendix D), and USACE provided spreadsheets (attached as Appendix E). Upland non-jurisdictional features were further evaluated for hydrologic connectivity with the results provided in Appendix F.

3.0 REGULATORY SETTING

3.1 U.S. ARMY CORPS OF ENGINEERS

The USACE regulates the discharge of dredged or fill material into Waters of the U.S. pursuant to Section 404 of the CWA.

3.1.1 Waters of the U.S.

The term "Waters of the U.S." is defined in USACE regulations at 33 CFR Part 328.3(a) as:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- All interstate waters including interstate wetlands;
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters;
- Which or could be used by interstate or foreign travelers for recreation or other purposes; or
- From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
- Which are used or could be used for industrial purpose by industries in interstate commerce;
- All impoundments of waters otherwise defined as Waters of the U.S. under the definition;
- Tributaries of waters identified in paragraphs (a) (1) through (4) of this section;
- The territorial seas;
- Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1) through (6) of this section; and
- Waters of the U.S. do not include prior converted cropland.

The limits of USACE jurisdiction in non-tidal waters extends to the OHWM which is defined at 33 CFR 328.3(e) as:

> "…that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses 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."

3.1.2 Wetlands

The term "wetlands" (a subset of "Waters of the U.S.") is defined at 33 CFR 328.3(b) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support...a prevalence of vegetation typically adapted for life in saturated soil conditions." In 1987, the Corps published a manual to guide its field personnel in determining jurisdictional wetland boundaries followed by the Arid West Supplement in 2008. The methodology set forth in the 1987 Wetland Delineation Manual and Arid West Supplement generally requires that, in order to be considered a wetland, the vegetation, soils, and hydrology of an area exhibit at least minimal hydric characteristics. While the manual provides great detail in methodology and allows for varying special conditions, a wetland should normally meet each of the following three criteria:

1. The plant community must be determined to by hydrophytic based on: (1) the dominance test applied using the 50/20 rule[3], or (2) where the vegetation fails the dominance test and wetland hydrology and hydric soils are present, vegetation is determined to be hydrophytic using the Prevalence Index test[4] based upon the indicator status (i.e., rated as facultative or wetter) in the National List of Plant Species that Occur in Wetlands[5]);
2. Soils must exhibit physical and/or chemical characteristics indicative of permanent or periodic saturation (e.g., redoximorphic features with a matrix of low chroma indicating a relatively consistent fluctuation between aerobic and anaerobic conditions); and
3. Hydrologic characteristics must indicate that the ground is saturated to within 12 inches of the surface for a sufficient period to cause: (1) the formation of hydric soils; and (2) establishment of a hydrophytic plant community. A positive test for wetland hydrology is based on the presence of one primary or two secondary indicators.

3.1.3 Supreme Court Decisions

3.1.3.1 Solid Waste Agency of North Cook County

On January 9, 2001, the Supreme Court of the United States issued a decision on *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, et al.* with respect to whether the USACE could assert jurisdiction over isolated waters. The Solid Waste Agency of North Cook County (SWANCC) ruling stated that the USACE does not have jurisdiction over "non-navigable, isolated, intrastate" waters.

[3] If a particular species accounts for more than 50% of the total coverage of vegetation in the stratum, or for at least 20% of the total coverage in the stratum which the species was found, that species is defined as dominant.
[4] A Prevalence Index is calculated using wetland indicator status and relative abundance for each vascular plant species present.
[5] Reed, P.B., Jr. 1988. *National List of Plant Species that Occur in Wetlands*. U.S. Fish and Wildlife Service Biological Report 88(26.10).

3.1.3.2 Rapanos/Carabell

In the Supreme Court cases of *Rapanos* v. *United States* and *Carabell* v. *United States* (herein referred to as *Rapanos*), the court attempted to clarify the extent of USACE jurisdiction under the CWA. The nine Supreme Court justices issued five separate opinions (one plurality opinion, two concurring opinions, and two dissenting opinions) with no single opinion commanding a majority of the Court. In light of the *Rapanos* decision, the USACE will assert jurisdiction over traditional navigable waters, wetlands adjacent to traditional navigable waters, non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months) and wetlands that directly abut such tributaries. The USACE will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water: non-navigable tributaries that are not relatively permanent, wetlands adjacent to non-navigable tributaries that are not relatively permanent, and wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

Flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary indicate whether they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters. Analysis of potentially jurisdictional streams includes consideration of hydrologic and ecologic factors. The consideration of hydrological factors includes volume, duration and frequency of flow, proximity to traditional navigable waters, size of watershed, average annual rainfall, and average annual winter snow pack. The consideration of ecological factors also includes the ability for tributaries to carry pollutants and flood waters to a TNW, the ability of a tributary to provide aquatic habitat that supports a TNW, the ability of wetlands to trap and filter pollutants or store flood waters, and maintenance of water quality.

According to a USACE guidance document (USACE 2008a) the USACE generally will not assert jurisdiction over the following features: swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow) and ditches (including roadside ditches) excavated wholly in and draining only uplands that generally do not carry a relatively permanent flow of water.

3.2 REGIONAL WATER QUALITY CONTROL BOARD

The RWQCB regulates activities pursuant to Section 401(a)(1) of the federal CWA. Section 401 of the CWA specifies that certification from the State is required for any applicant requesting a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities that may result in any discharge into navigable waters.

3.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

The State of California regulates water resources under Section 1600-1616 of the California Fish and Game Code. Section 1602 states:

> "An entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake."

CDFW jurisdiction includes ephemeral, intermittent and perennial watercourses and extends to the top of the bank of a stream or lake if unvegetated, or to the limit of the adjacent riparian habitat located contiguous to the watercourse if the stream or lake is vegetated.

4.0 RESULTS

A jurisdictional delineation of the survey area identified waters of the U.S. including wetlands and CDFW riparian and unvegetated streambed occurring onsite (Appendix A, Figures 5a-5t). Additionally, several non-jurisdiction upland ditches were identified within the survey area. The following is a discussion of survey results.

A total of five major offsite drainage features either cross or are located longitudinally to the rail corridor. The crossings from west to east are known as Warm Creek (Historic) (Bridge 1.1), Twin Creek (Bridge 2.2), Santa Ana River (Bridge 3.4), Bryn Mar Road (Bridge 5.75), and Mill Creek Zanja (Bridge 9.4). Mission Zanja Creek occurs adjacent to the eastern segment of the rail corridor. The following is a description of these features:

Santa Ana River

The main drainage feature within the Santa Ana Watershed is the Santa Ana River which is approximately 96 miles long, with its major upstream tributaries, including Bear Creek and Mill Creak. Other tributaries just downstream of the survey area include Lytle Creek originating in the San Gabriel Mountains and the San Jacinto River originating in the San Jacinto Mountains. The Santa Ana River bisects the survey area at Mile Post (MP) 3.4 (or Bridge 3.4), which corresponds with approximately River Mile 28.62 (or Reach 4).

A portion of the Santa Ana River occurs within the survey area between Waterman and Tippecanoe Streets (Appendix A, Figure 5g). The streambed consists primarily of unvegetated fine sandy substrate with some cobble and areas of raised vegetated bars/islands. The bars and islands are primarily dominated by willow (*Salix* sp.) scrub, cottonwood, and mulefat with some upland species occurring in the understory such as California sagebrush (*Artemisia californica*) and flat-top buckwheat (*Eriogonum fasciculatum*) (Appendix B, Photographs 6, 7, 8, and 11). Within the survey area the river is generally confined to the east and west by development or maintained (i.e., reinforced) floodplain. The northeastern and southeastern banks of the river are vegetated with cottonwood and willow scrub vegetation. The northwest portion of the river bank is leveed with concrete and metal mesh rip rap and the southwest bank supports a large stand of eucalyptus trees (Appendix B, Photograph 4). Off-road vehicles tracks are common within the unvegetated portion of the channel.

The portion of the Santa Ana River within the survey area supports an ephemeral flow regime. Ponded water was observed in the low points of the riverbed up to several weeks after winter and spring rains. However, during various biological surveys, the riverbed was generally observed to be dry. Within the survey area, the Santa Ana River supports waters of the U.S. and CDFW riparian and unvegetated streambed.

Mission Zanja Flood Control Channel

The Mission Zanja Flood Control Channel (or Mission Zanja Channel) parallels the rail corridor to the south from its confluence with the Santa Ana River to approximately 1,000 feet west of California Street; a total distance of approximately 2.6 miles. Owned and maintained by SBCFCD, the Zanja Channel

consists of an un-improved trapezoidal earthen channel with some segments supporting wire revetment (Appendix A, Figures 5g-5m; Appendix B, Photographs 6 and 12). The western terminus of the channel (outlet into Santa Ana River) supports dense native riparian vegetation and is heavily incised (15-20 feet). Trash and debris can be found throughout the channel.

The Mission Zanja Channel is culverted where it is crossed by paved roads through the cities of Loma Linda and Redlands. The channel has been artificial levied to decrease the risk of flooding to near by communities as a result to surrounding urban encroachment. Due to the surround urbanization there are many storm water drains that discharge into the channel.

Within the survey area, Mission Zanja Channel is ephemeral and supports waters of the U.S. and CDFW riparian and unvegetated streambed.

Twin Creek

Twin Creek (also known as "East Twin Creek and Warm Creek Channel") is a major channel that conveys flows from the Twin Creek Spreading Grounds in northern San Bernardino to its confluence with the Santa Ana River at the northeast quadrant of I-10/I-215 separation. Twin Creek is owned, operated, and maintained by the San Bernardino County Flood Control District (SBCFCD). According to USACE record drawings, Twin Creek consists of a 60-foot wide by 14-foot high rectangular concrete channel (RCC) through the survey area (Appendix A, 5c-5d; Appendix B, Photograph 3). Further downstream, the channel transitions to an unimproved (earthen) 202-foot wide base trapezoidal channel (with 2 to 1 side slopes) prior to discharging into Reach 5 of the Santa Ana River. The portion crossing the rail corridor was constructed in 1958.

Twin Creek primarily occurs as a large, unvegetated, concrete-lined channel, with vertically incised banks, and flows northeast to southwest through the survey area. The southern portion of the creek occurring in the survey area transitions to a sandy substrate with steeply sloped concrete banks. The sandy streambed supports sparse wetland vegetation, primarily low herbaceous plants and early successional shrub (mulefat) and sapling tree species (*Salix* spp., cottonwood). Within the survey area, Twin Creek is ephemeral and supports waters of the U.S. including wetlands and CDFW riparian and unvegetated streambed.

Warm Creek (Historic)

Warm Creek (Historic) extends from north of the City of Highland downstream to its confluence with the Santa Ana River at the southwest quadrant of the I-10/I-215 separation (Appendix A, Figure 5a; Appendix B, Photograph 5). The East Twin and Warm Creek improvements constructed by the USACE in 1961 diverted most of the original flows to the SAR at a point 1.4 miles upstream of its original confluence, resulting in a rerouting of the portion of Warm Creek from about 5th Street south to Central Avenue. The Warm Creek Bypass Channel today connects the Twin Creek Channel to the downstream Warm Creek Channel. Consequently, the left over portion of Warm Creek no longer serves as a regional flood control facility but only conveys tributary local drainage (about 18 square miles) from the City of San Bernardino (HDR 2012a); hence, this remaining portion of the channel is referred to as Warm Creek (Historic) throughout the delineation report. Currently, the City of San Bernardino owns, operates, and maintains Warm Creek (Historic).

Within the survey area, Warm Creek primarily occurs as a narrow, un-vegetated, concrete-lined channel, with vertically incised banks, and flows north to south through the survey area. Warm Creek supports waters of the U.S. and CDFW unvegetated streambed.

Mill Creek Zanja

Mill Creek Zanja occurs within the survey area at MP 9.5 (Appendix A, Figure 5r-5s; Appendix B, Photographs 13 and 14). The ephemeral creek was originally built by Native Americans as a ditch for water supply in 1819. As the area developed, the use of the Mill Creek transformed from water supply to a flood control and drainage channel. The Mill Creek Zanja, from 9th Street to Mill Creek, is designated as a State and Federal Historic Structure. SBCFCD owns the portion of the Mill Creek upstream and downstream of the Study Area. Mill Creek is covered with grouted rip rap as it conveys flow under I-10 (east crossing). The creek supports sparse non-native vegetation, sandy substrate, riprap banks, and substantial urban trash and debris.

Within the survey area, Mill Creek Zanja is ephemeral and supports waters of the U.S. and CDFW riparian and unvegetated streambed.

Proposed Non-Jurisdictional Features

Throughout the survey area, storm water from adjacent urban areas is channeled into the railroad ROW and transported through a series of ditches. Examples of these features are provided in Appendix A, Figures 5a-5t and Appendix B, Photographs 9 and 10. These features occur entirely within upland areas, exhibit indistinct or intermittent OHWM and do not support riparian vegetation. Non-jurisdictional ditches within the Survey area are presented in Table 2. Additional details on these features are provided in Appendix E and F.

Table 2. Non-Jurisdictional Ditches within the Survey Area

Ditch ID	Existing Acreage within the Survey Area*
NJD A1	0.05
NJD A2	0.01
NJD A3	0.01
NJD B	0.25
NJD C	0.55
NJD D	0.01
NJD E	0.05
NJD F	0.01
NJD G1	0.11
NJD G2	0.01
NJD H1	<0.01
NJD H2	<0.01
NJD I1	0.01
NJD I2	0.17
NJD I3	0.02
NJD I4	0.05
NJD J1	0.05
NJD J2	0.02
NJD A1	0.05

* Acreages rounded to the nearest hundredth acre.

4.1 USACE WETLANDS AND WATERS

As discussed in Section 2.0, Methods, suspected jurisdictional areas were field checked for the presence of an OHWM, definable channels and/or wetland vegetation, soils and hydrology. Four soil pits were conducted within the survey area. The following is a summary of the results; soil data sheets can be found in the attached delineation report (Appendix C).

Soil Pit 1

Soil Pit 1 (SP1) was located in a depressional area located north of the railroad tracks (Appendix A, Figures 5h; Appendix B, Photographs 15 and 16). The area is supported by stormwater runoff from the ROW and is located adjacent to the Zanja Channel. This area exhibited a predominance of hydrophytes including: arroyo willow (FACW), Fremont cottonwood (FAC), mulefat (FAC), and desert wild grape (*Vitis girdiana*; FAC). SP1 soils supported a loam matrix of very dark brown (10YR 3/2) and exhibited redoximorphic concentrations of strong brown (7.5YR 5/6) within 25 percent of the soil matrix. Hydric soils were identified as redox depression (F8). Hydrologic indicators at SP1 included water-stained leaves and biotic crust. SP1 meets the criteria for wetlands.

Soil Pit 2

Soil Pit 2 (SP2) was located in a depressional area located north of SP1 and the railroad tracks Appendix A, Figure 5h; Appendix B, Photograph 17). The area is supported by stormwater runoff from adjacent development and is blocked from connecting with the Zanja Channel by manufactured earthen berms (Appendix B, Photograph 18). The area supports moderately dense cover of 50 percent tamarisk (*Tamarisk* sp.; FAC) and 15 percent Johnson grass (*Sorghum halipense*; FACU). Using both the hydrophytic dominance test and prevalence index worksheets, SP2 does not meet USACE hydrophytic vegetation criteria SP2 supported a silty clay loam dusky red (2.5YR 3/2) matrix at 0-2 inches and a silty clay loam olive (5Y 4/3) matrix at 2-15 inches. Soils did not exhibit redoximorphic features. Hydric soils were identified as depleted matrix (F3). Hydrologic indicators at SP2 included surface soil cracks and inundation on aerial imagery. SP2 does not meet the criteria for wetlands.

Soil Pit 3

Soil Pit 3 (SP3) was located on the northern side of the Twin Creek streambed (Appendix A, Figure 5d; Appendix B, Photograph 2). Hydrophytic vegetation is dominant at SP1 and includes sparse coverage of mulefat (FAC) and Typha (*Typha* sp.; OBL). The area occurs at the transition from concrete-lined channel bottom to sandy substrate. This area is highly disturbed with a significant amount of urban trash and debris (Appendix B, Photograph 3). SP3 soils were inundated and had a hydrogen sulfide smell when agitated. Hydric soils were identified as redox hydrogen sulfide (A4). Hydrologic indicators at SP3 included surface water, saturation, water-stained leaves, and muck surface. SP3 meets the criteria for wetlands.

Soil Pit 4

Soil Pit 4 (SP4) was located on the southern side of the Twin Creek streambed (Appendix A, Figure 5d; Appendix B, Photograph 3). Hydrophytic vegetation is dominant at SP1 and includes: *Salix* sp. (FACW) and mulefat (FAC). Similar to SP3 area, SP4 occurs at the transition from concrete-lined channel bottom to sandy substrate and supports urban trash and debris (Appendix B, Photograph 3). SP4 soils were inundated and had a hydrogen sulfide smell when agitated. Hydric soils were identified as redox

hydrogen sulfide (A4). Hydrologic indicators at SP4 included saturation, water marks, water-stained leaves, inundation on aerial imagery, and muck surface. SP4 meets the criteria for wetlands.

In summary, the survey area primarily supports waters of the U.S. including several small areas of USACE wetlands (Appendix A, Figures 5a–5t). USACE jurisdictional areas mapped within the survey area are summarized in Table 2 below.

Table 3. USACE Jurisdictional Areas within the Survey Area

Jurisdiction	Existing Acreage within the Survey Area*
USACE Waters of the US	16.7
USACE Wetlands	0.05
Total	**16.75**
Proposed Non-Jurisdictional Ditch**	1.39

* Acreages rounded to the nearest hundredth acre.
** Acreages in Table 2 may not add up exactly due to rounding

4.2 CDFW JURISDICTIONAL AREAS

All USACE jurisdictional drainages within the survey area are considered jurisdictional by the CDFW. CDFW jurisdiction is similar to that of USACE jurisdiction, but also extends to the top of the bank and encompasses riparian vegetation when present (Appendix A, Figures 5a-5t). CDFW jurisdictional areas occurring within the survey area are summarized in Table 3.

Table 4. CDFW Jurisdictional Areas within the Survey Area

Jurisdiction	Existing Acreage within the Survey Area*
CDFW Riparian	8.77
CDFW Unvegetated Streambed	29.84
Total	**38.61**
Proposed Non-jurisdictional Ditch**	1.39

* Acreages rounded to the nearest hundredth acre.
** Acreages in Table 2 may not add up exactly due to rounding.

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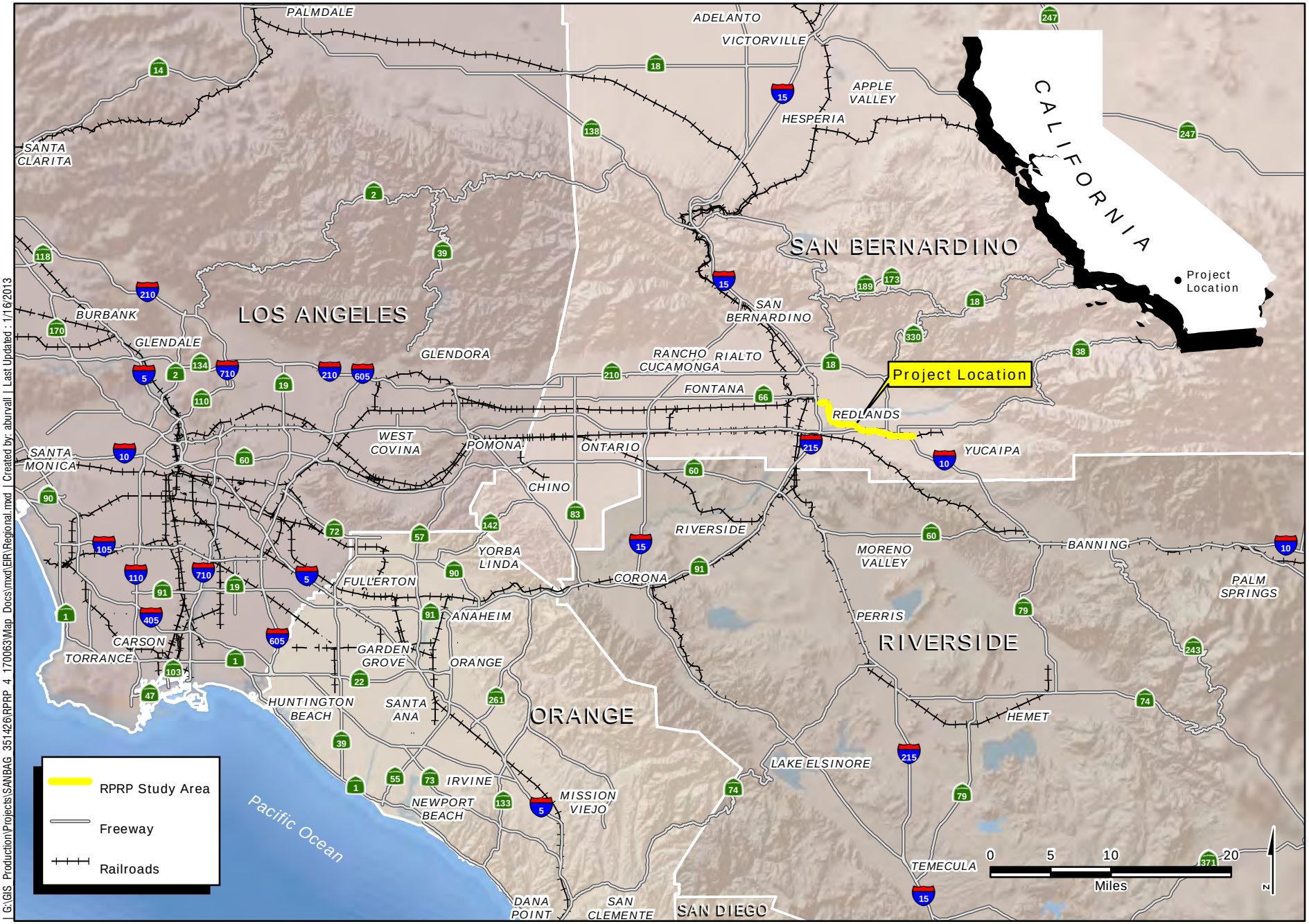
APPENDIX A

Figures



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Regional Location Map

Figure 1

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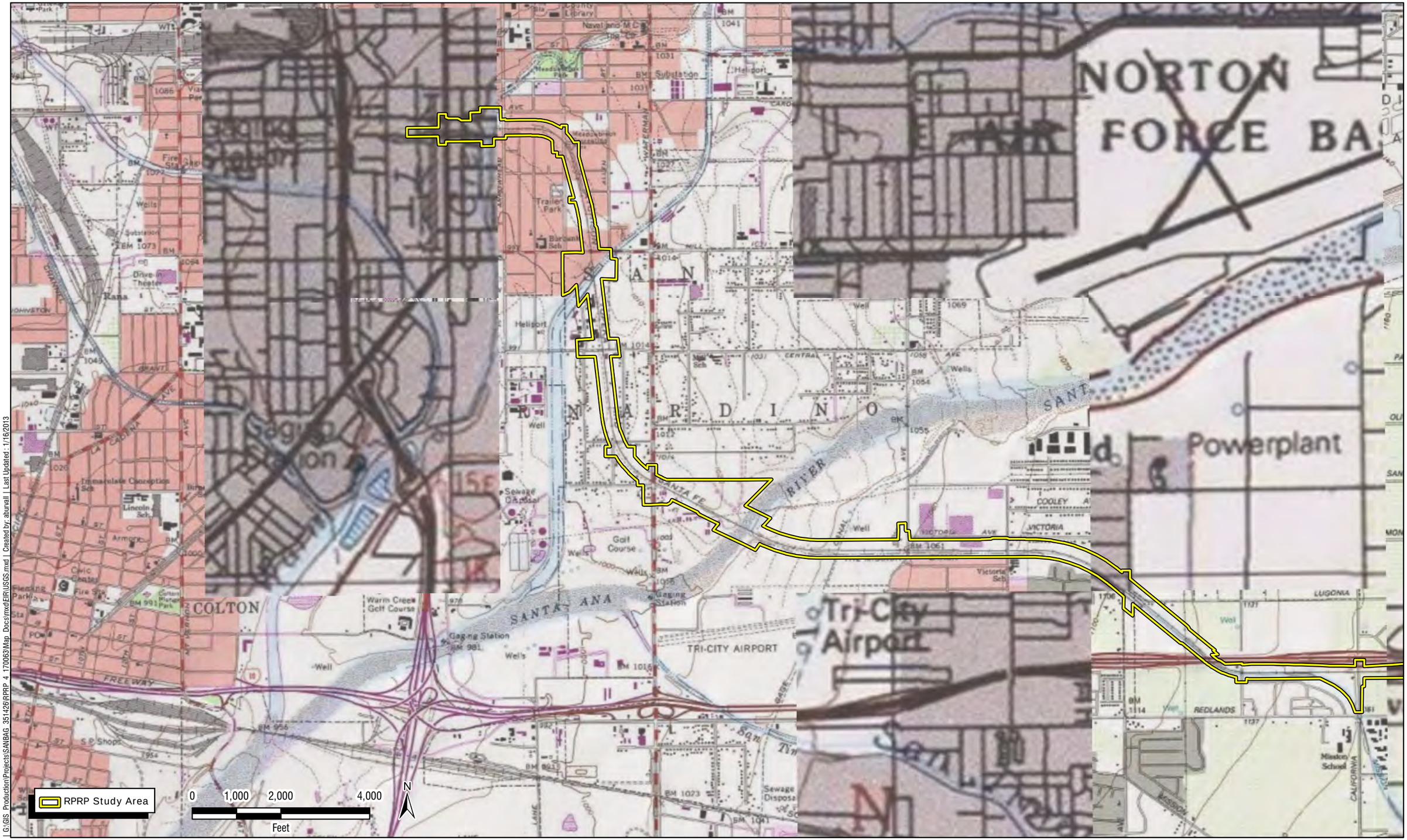

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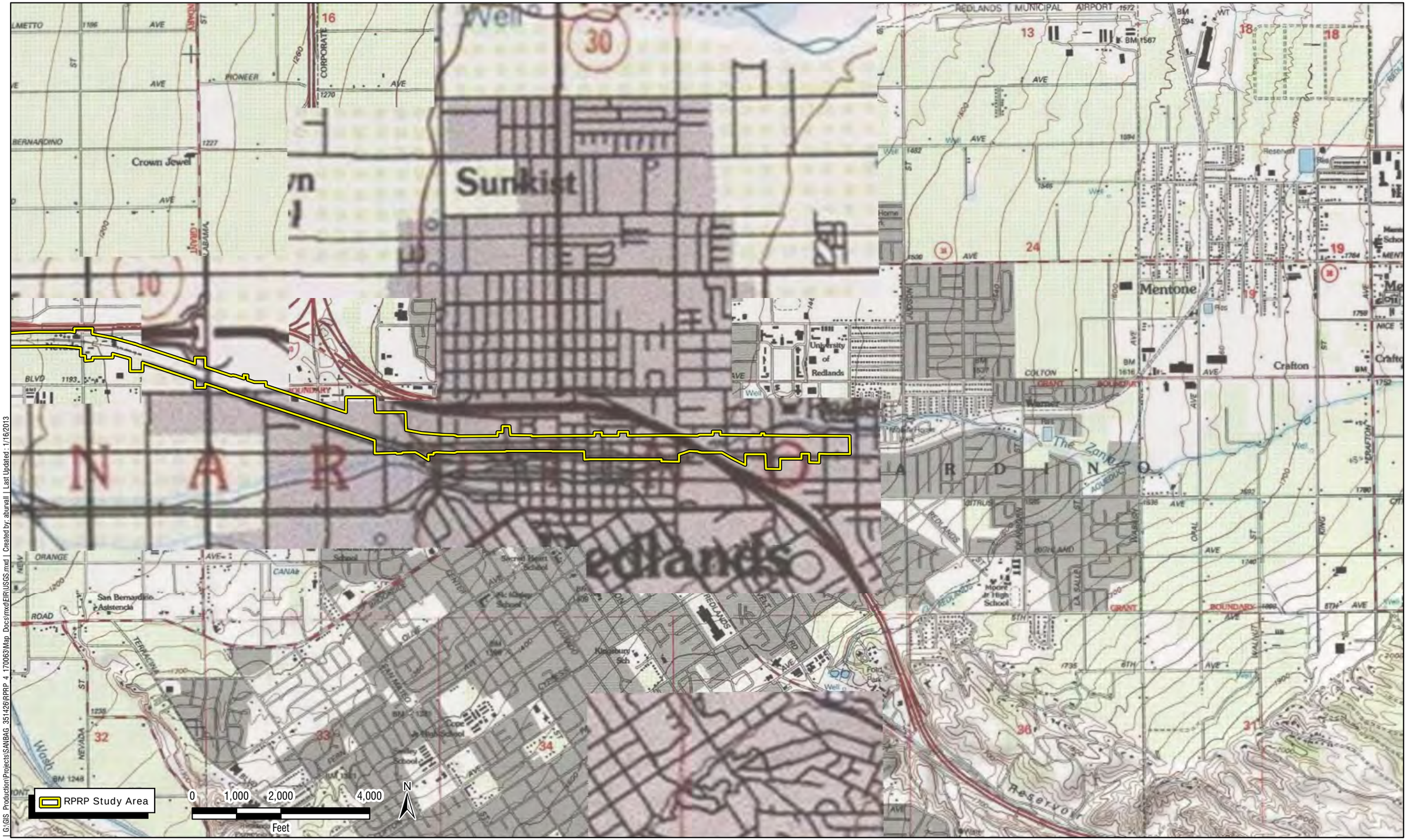
USGS Topographic Map

Figure 2a

FTA/SANBAG | Redlands Passenger Rail Project | JDR



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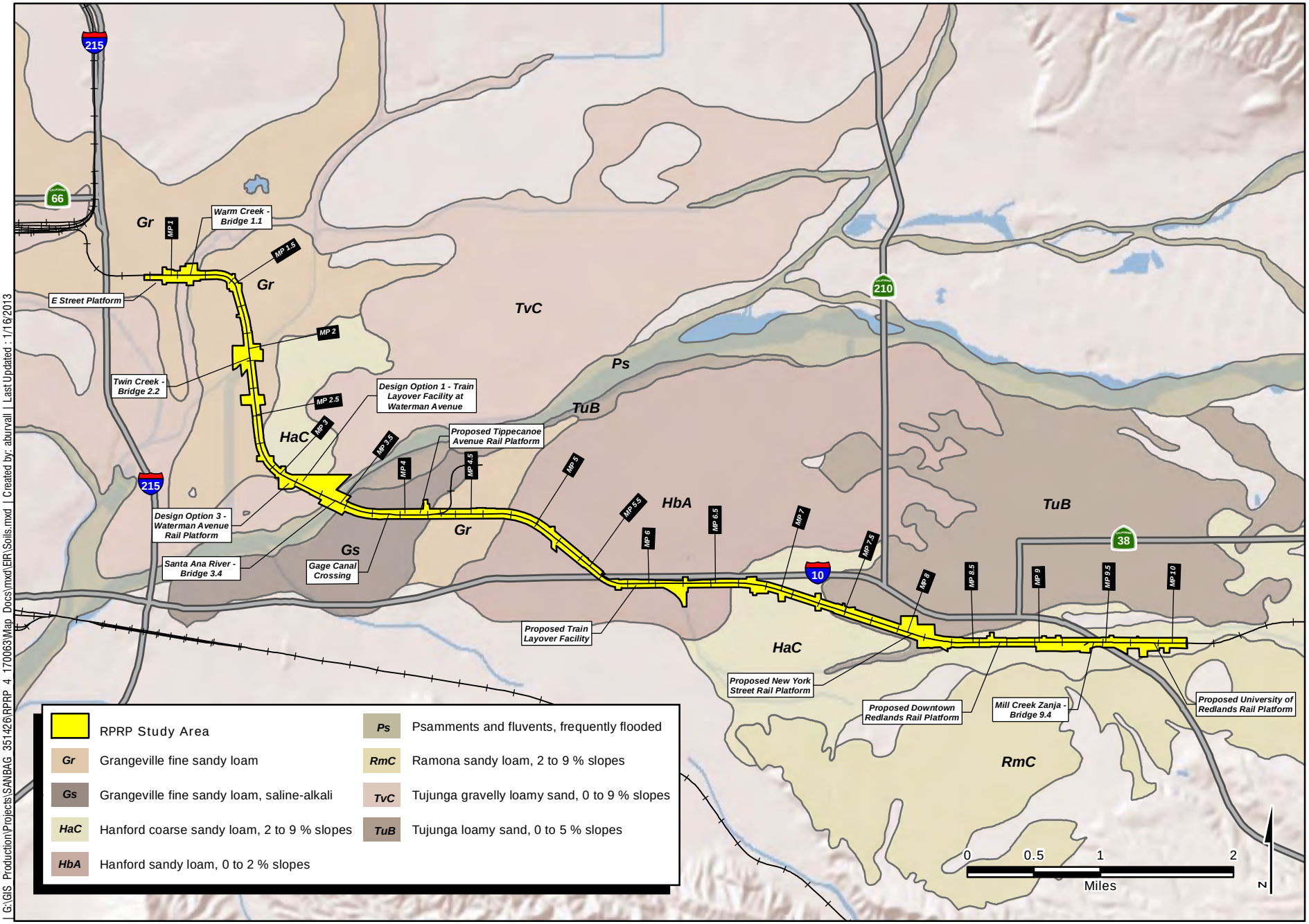
USGS Topographic Map
Figure 2b
FTA/SANBAG | Redlands Passenger Rail Project | JDR



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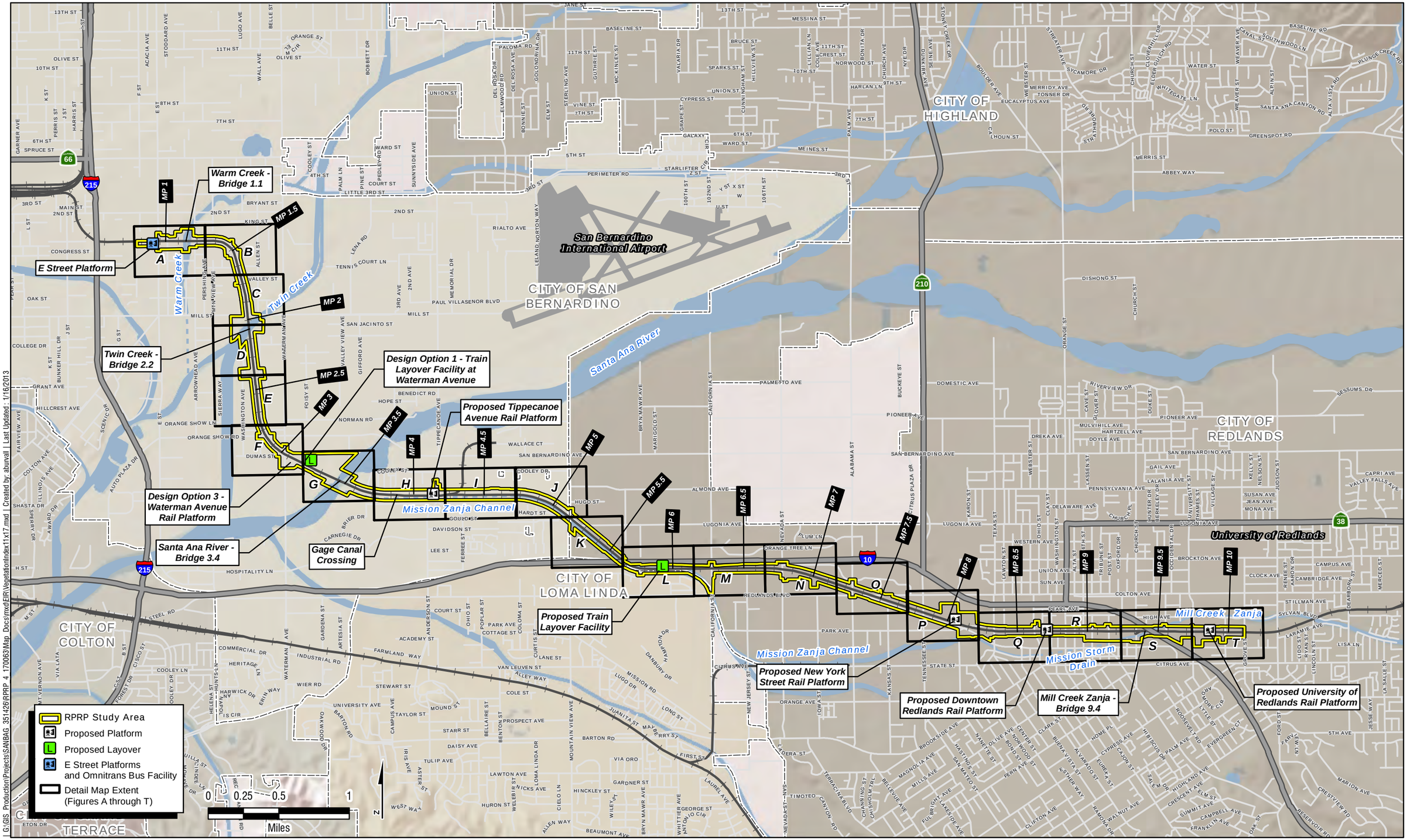
Soils

Figure 3

FTA/SANBAG | Redlands Passenger Rail Project | JDR



Vegetation Communities Overview

Figure 4

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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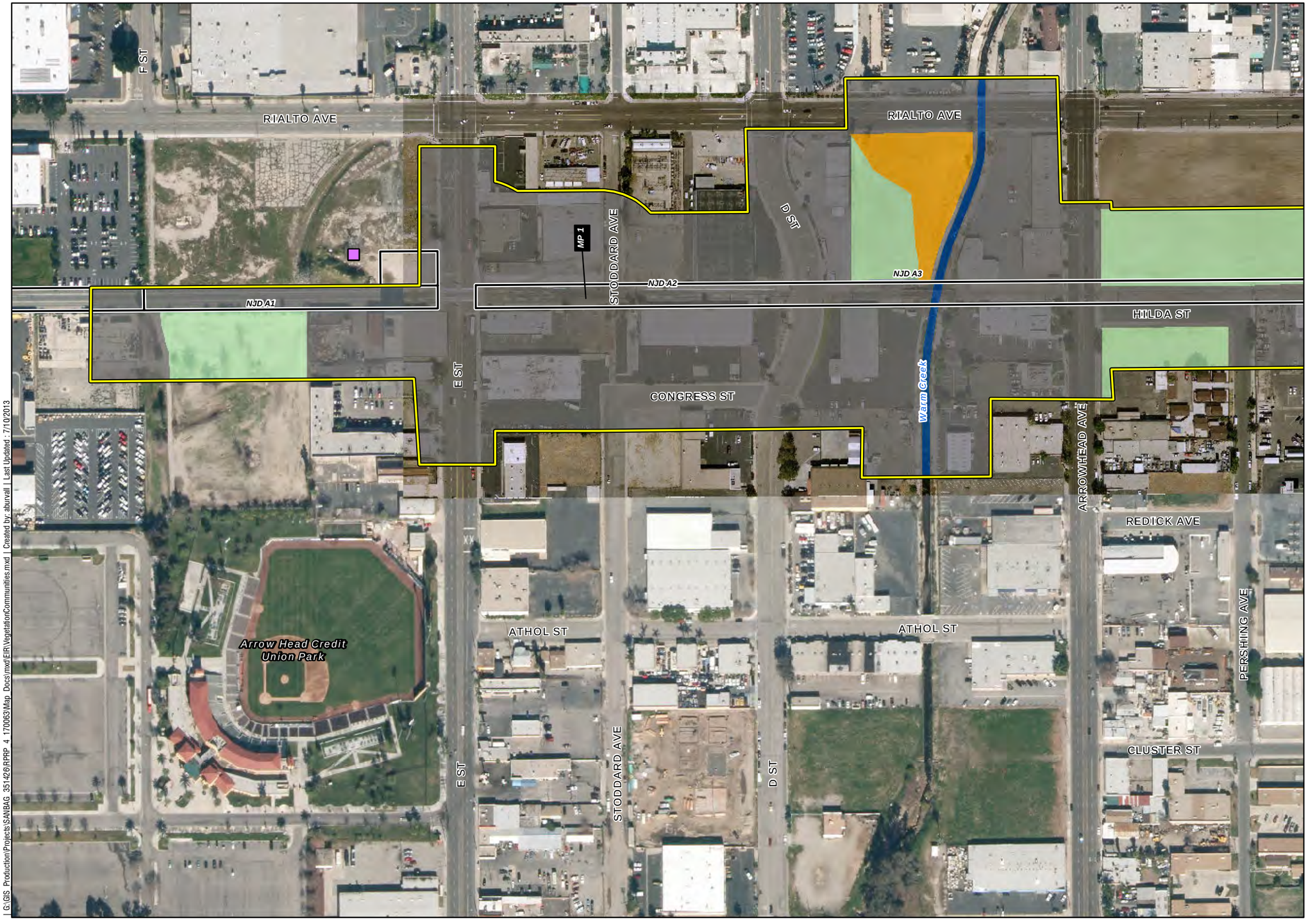


RPRP Study Area

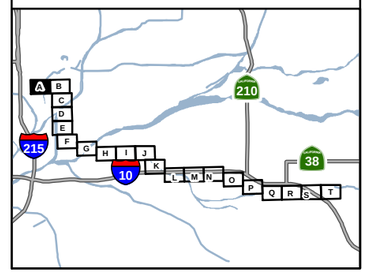
Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 A

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
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Species Observation

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- Least Bell's Vireo
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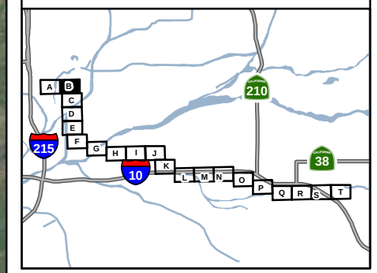

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Figure 4 B

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
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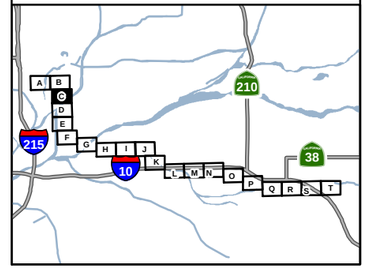
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 C

FTA/SANBAG | Redlands Passenger Rail Project | JDR

RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
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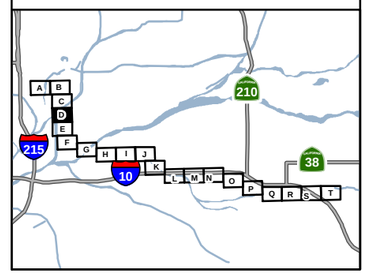
Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 D

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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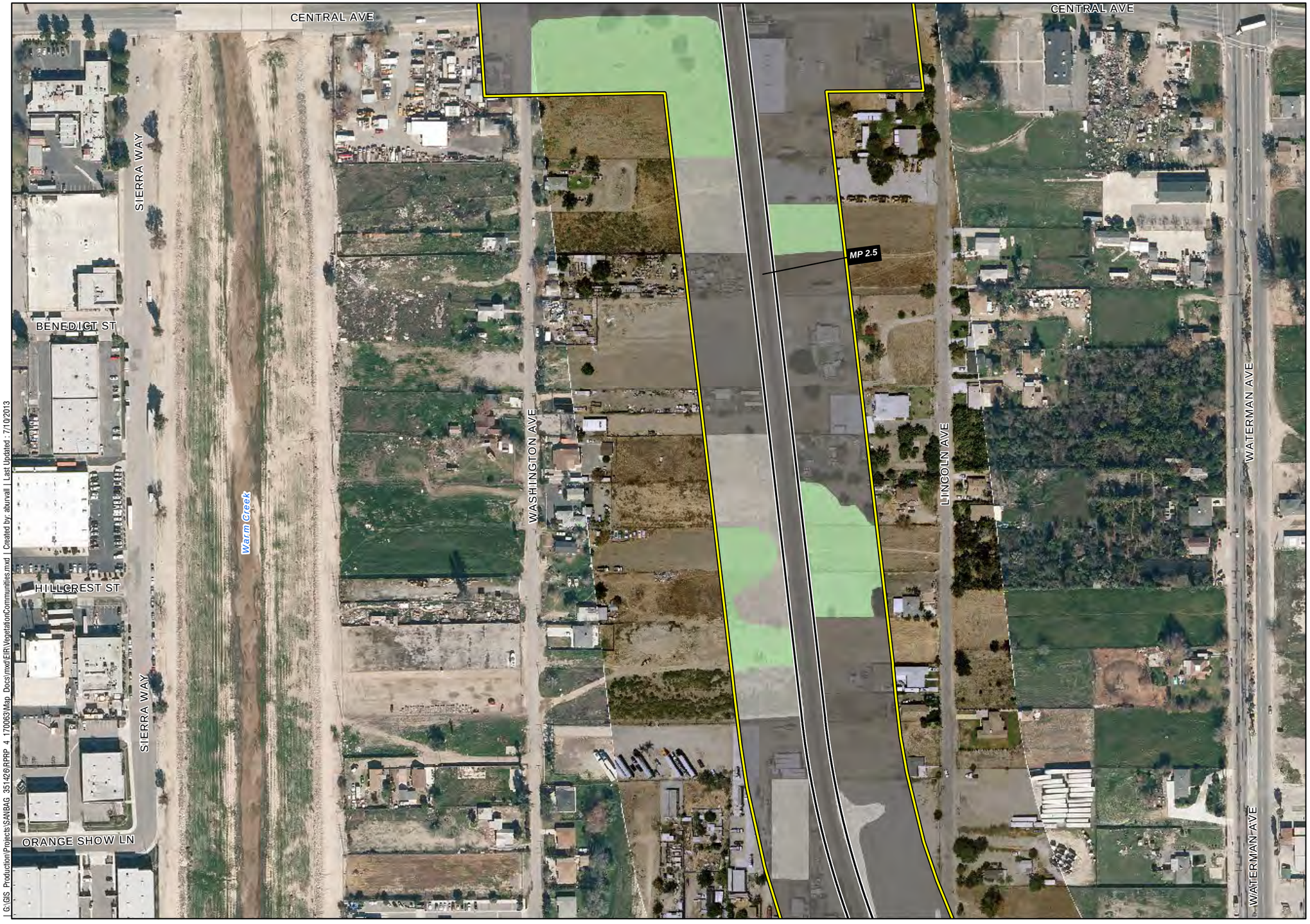

RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
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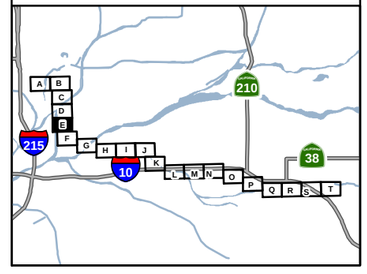
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 E

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
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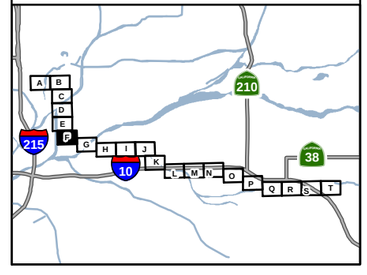
Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
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Species Observation

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- Least Bell's Vireo
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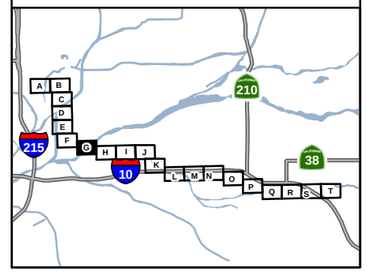

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Vegetation Communities

Figure 4 G

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
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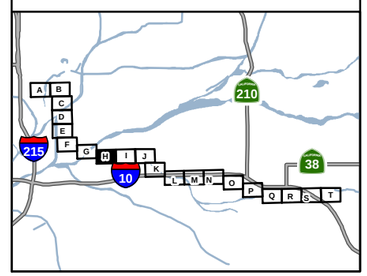

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Vegetation Communities

Figure 4 H

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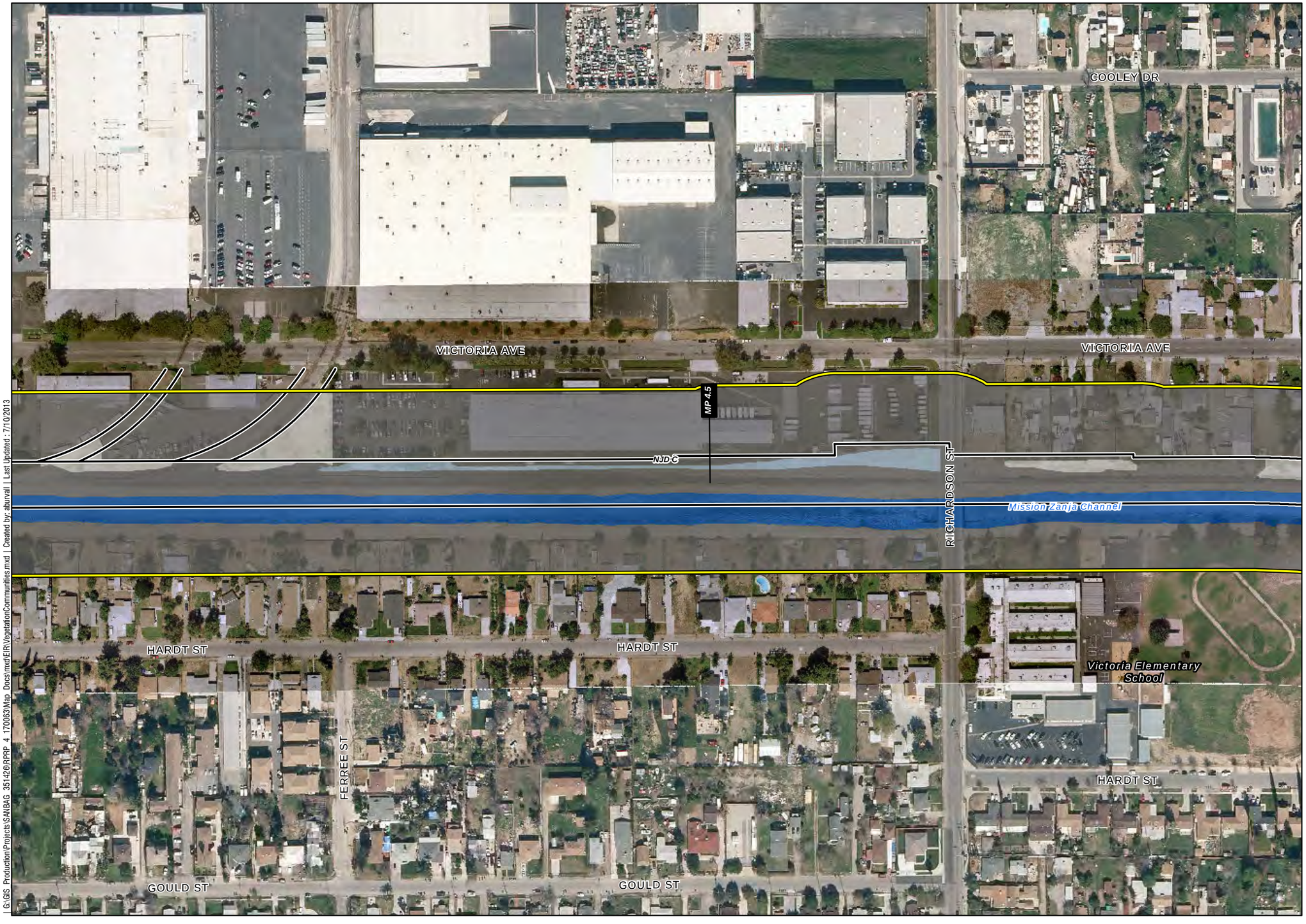

RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
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Species Observation

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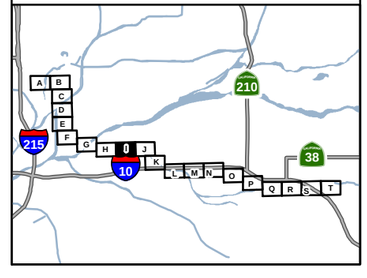
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 I

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
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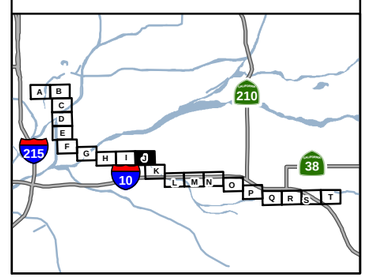

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Vegetation Communities

Figure 4 J

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RPRP Study Area

Railroad ROW

Vegetation Community

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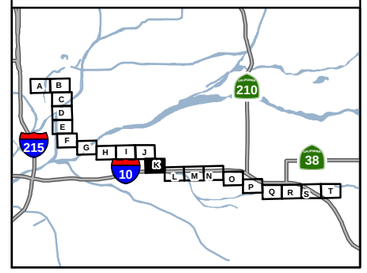

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Vegetation Communities

Figure 4 K

FTA/SANBAG | Redlands Passenger Rail Project | JDR

RPRP Study Area

Railroad ROW

Vegetation Community

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Species Observation

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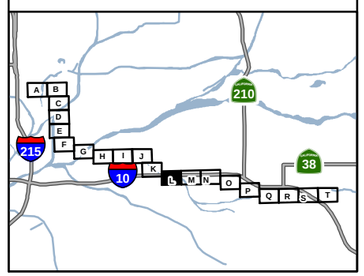
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 L

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I 10 FWY
I 10 FWY
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I 10 ONRP
CALIFORNIA ST
NEW JERSEY ST
TAFT ST
REDLANDS BLVD
REDLANDS BLVD
REDLANDS BLVD

RPRP Study Area
Railroad ROW

Vegetation Community
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Species Observation
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Vegetation Communities

Figure 4 M

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
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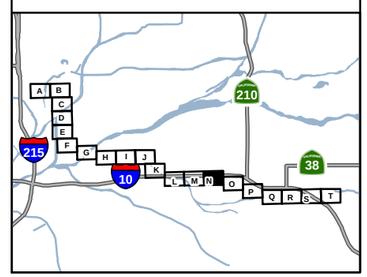
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 N

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
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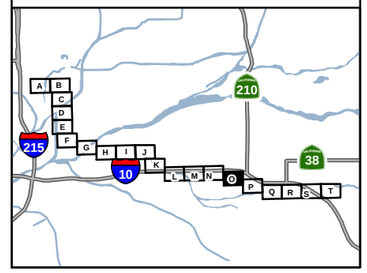

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Vegetation Communities

Figure 4 0

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RPRP Study Area

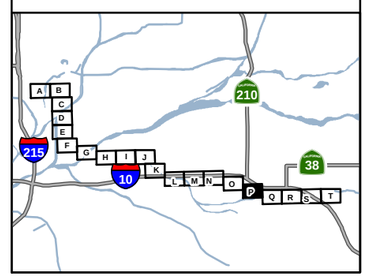
Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 P

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
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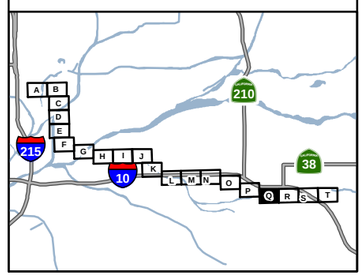
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 Q

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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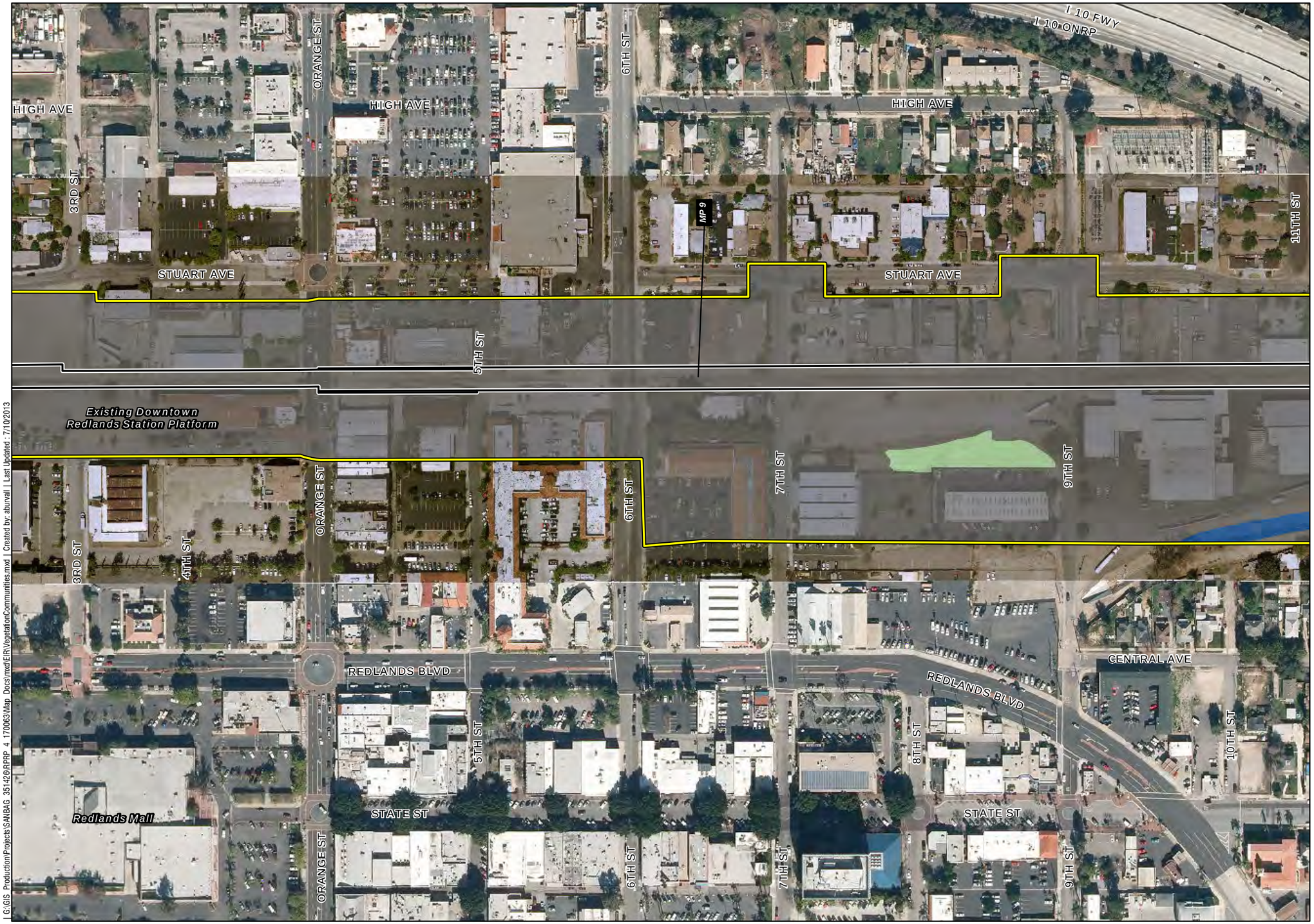

RPRP Study Area

Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
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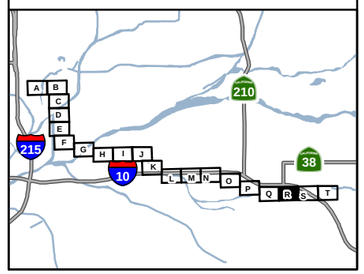
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 R

FTA/SANBAG | Redlands Passenger Rail Project | JDR

RPRP Study Area

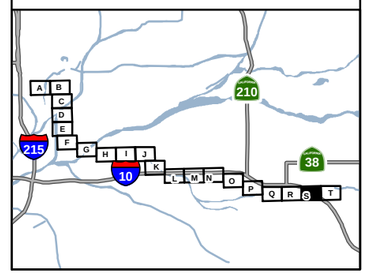
Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 S

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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SYLVAN BLVD
University of Redlands
GROVE ST
JEREMY CT
SYLVAN BLVD
MP 10
UNIVERSITY ST
COOK ST
CENTRAL AVE
CENTRAL AVE
CENTRAL AVE
KAYE CT
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RPRP Study Area
Railroad ROW

Vegetation Community
- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
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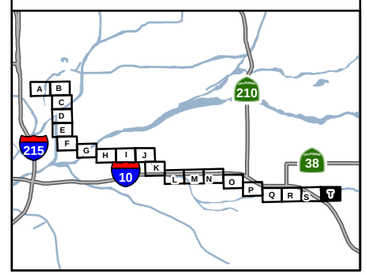
- Tamarisk Scrub
- Urban/Developed

Species Observation
- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Vegetation Communities

Figure 4 T

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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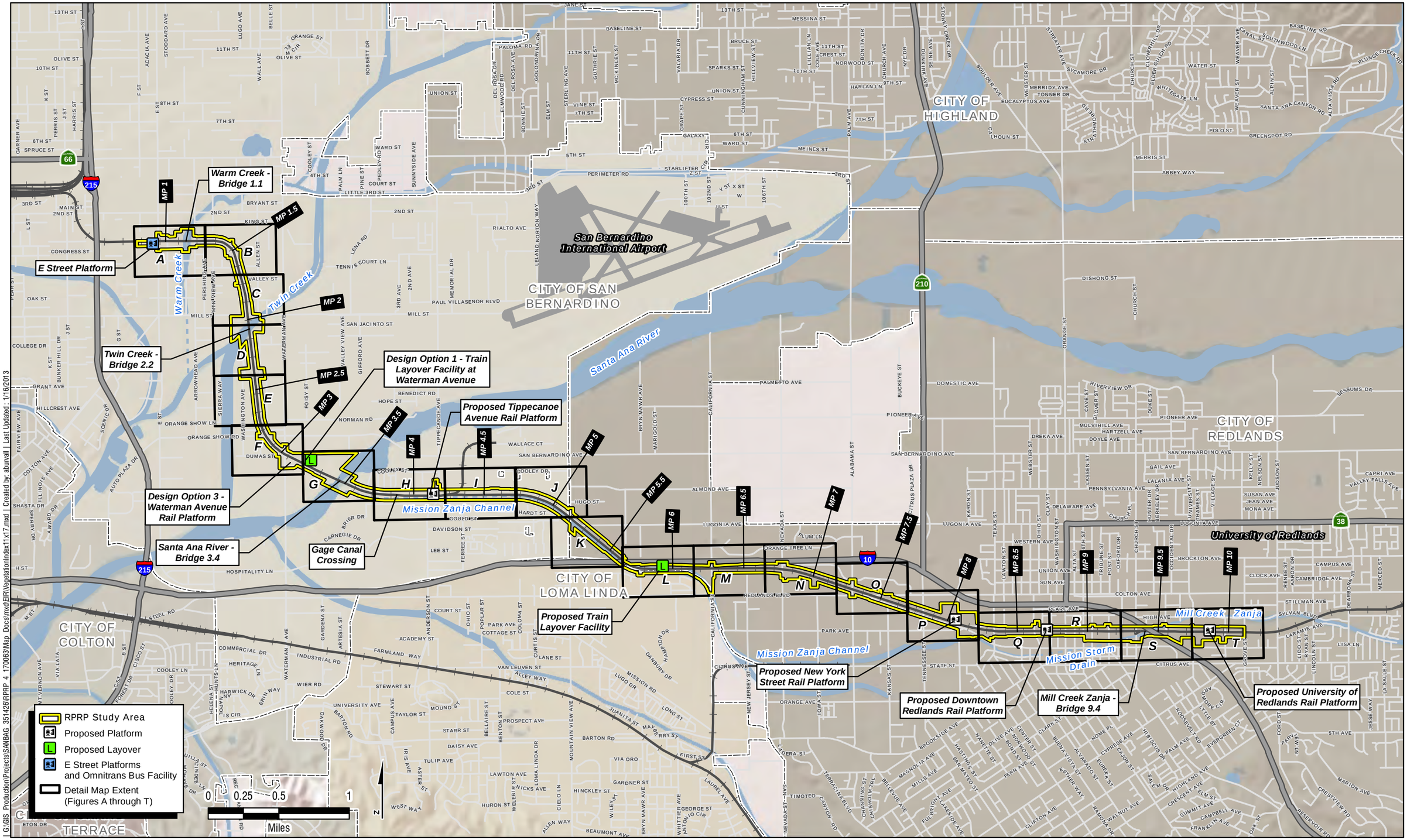

Wetland and Waters of the U.S Overview

Figure 5

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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RPRP Study Area

Railroad ROW

Jurisdiction

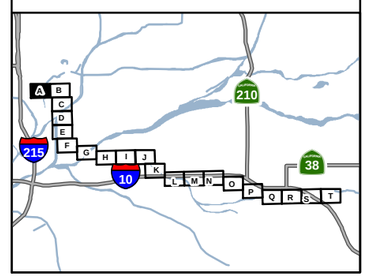
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 A

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RPRP Study Area

Railroad ROW

Jurisdiction

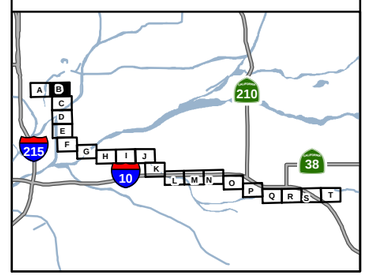
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 B

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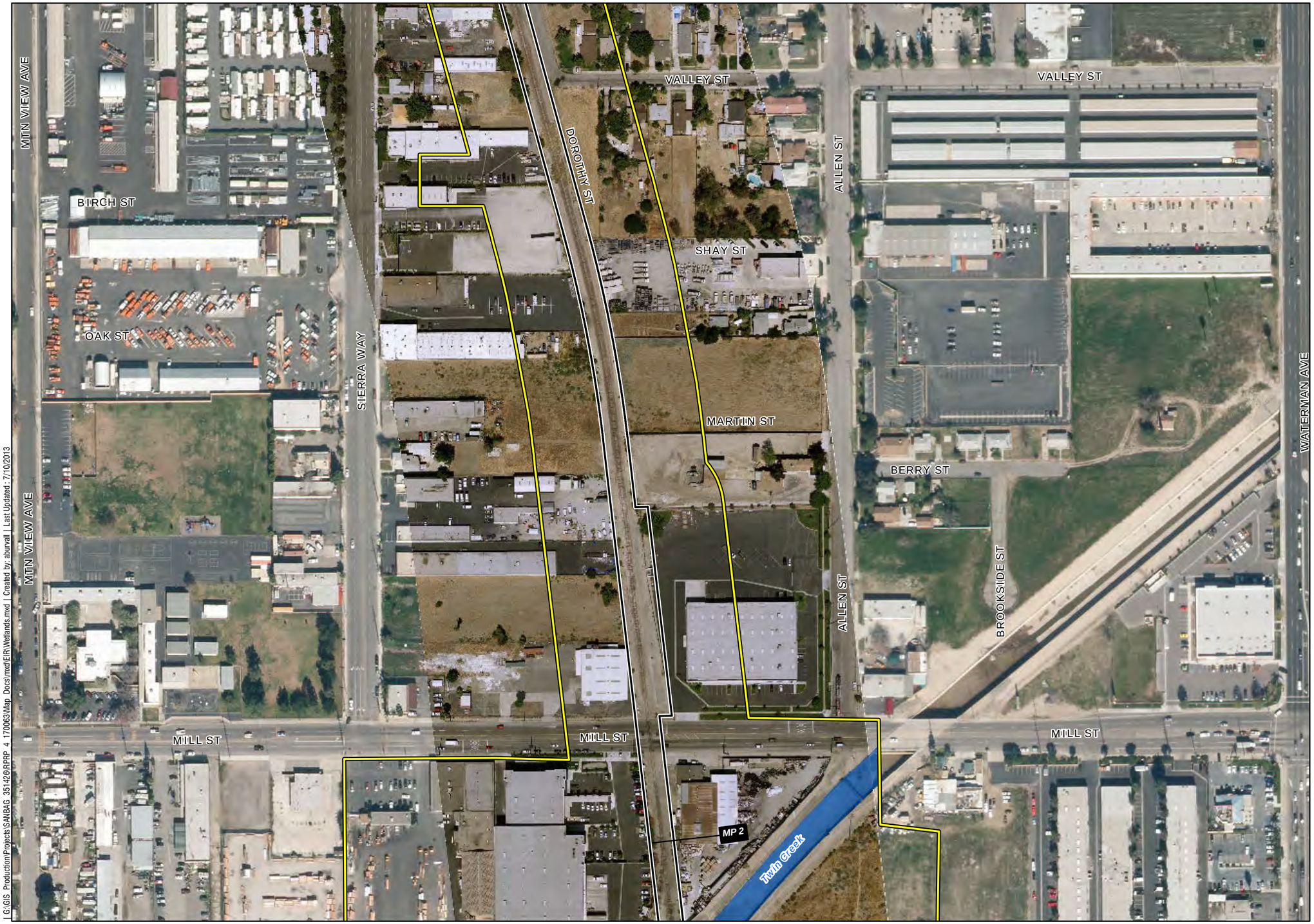


RPRP Study Area

Railroad ROW

Jurisdiction

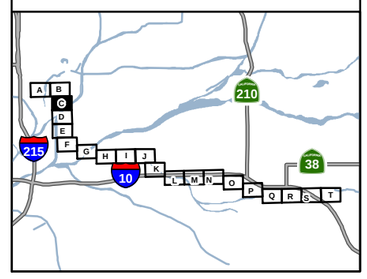
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 C

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RPRP Study Area

Railroad ROW

Jurisdiction

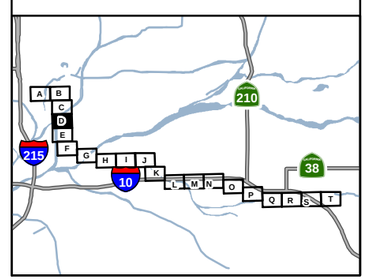
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 D

FTA/SANBAG | Redlands Passenger Rail Project | JDR

RPRP Study Area

Railroad ROW

Jurisdiction

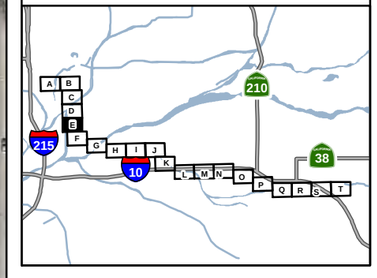
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 E

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RPRP Study Area

Railroad ROW

Jurisdiction

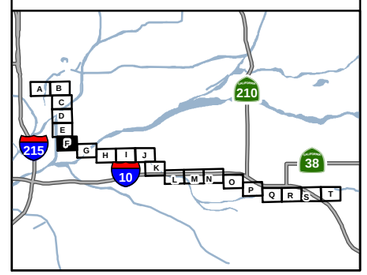
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 F

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RPRP Study Area

Railroad ROW

Jurisdiction

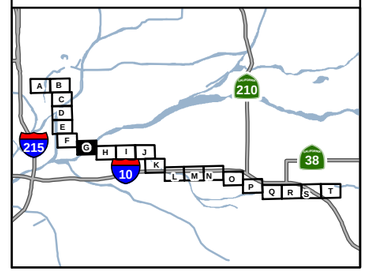
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 G

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RPRP Study Area

Railroad ROW

Jurisdiction

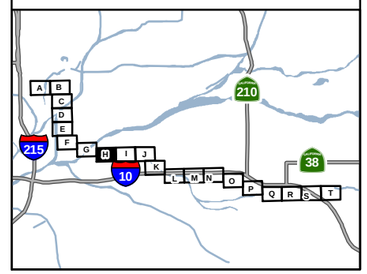
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 H

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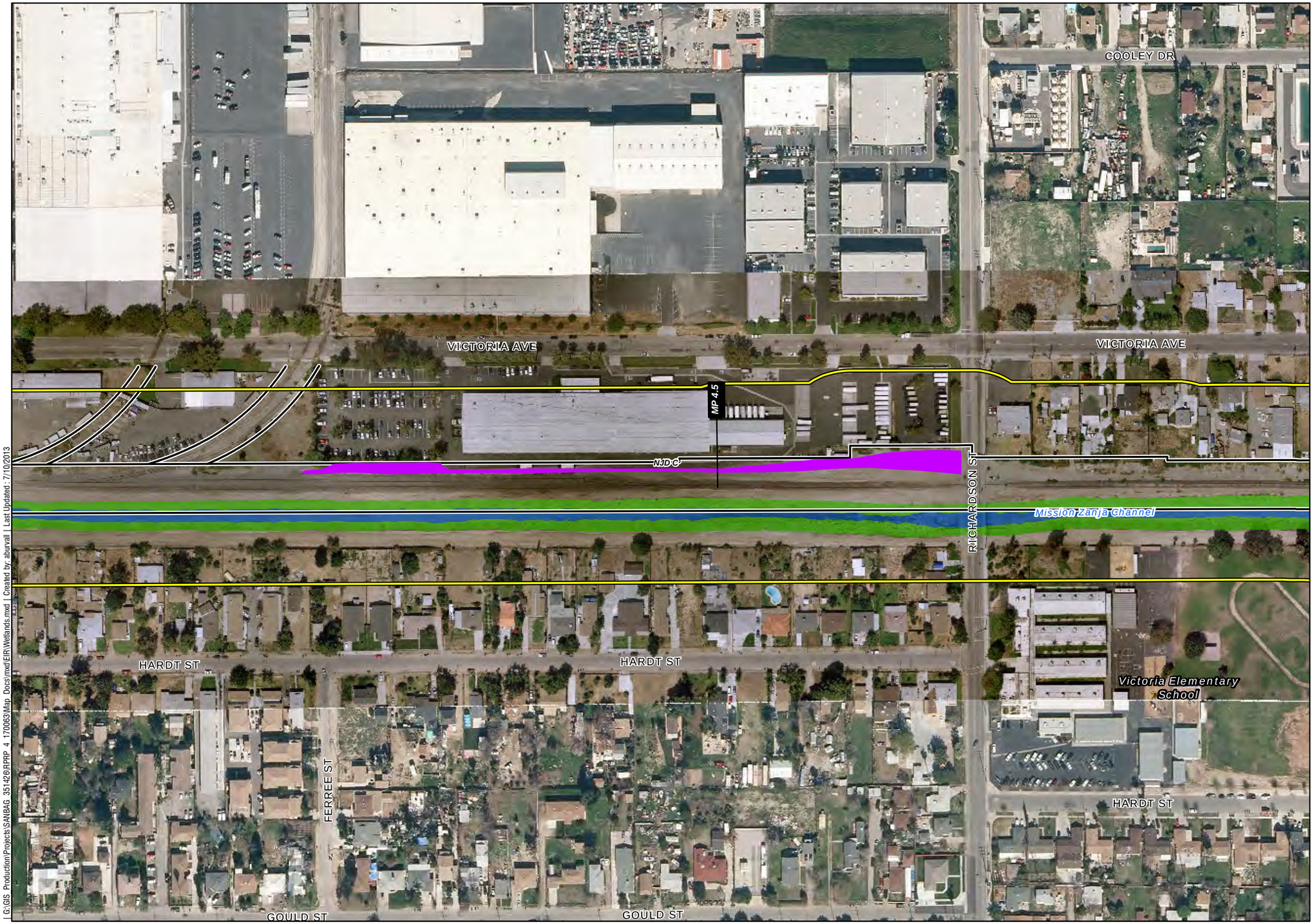


RPRP Study Area

Railroad ROW

Jurisdiction

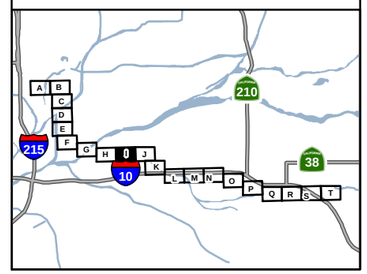
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 I

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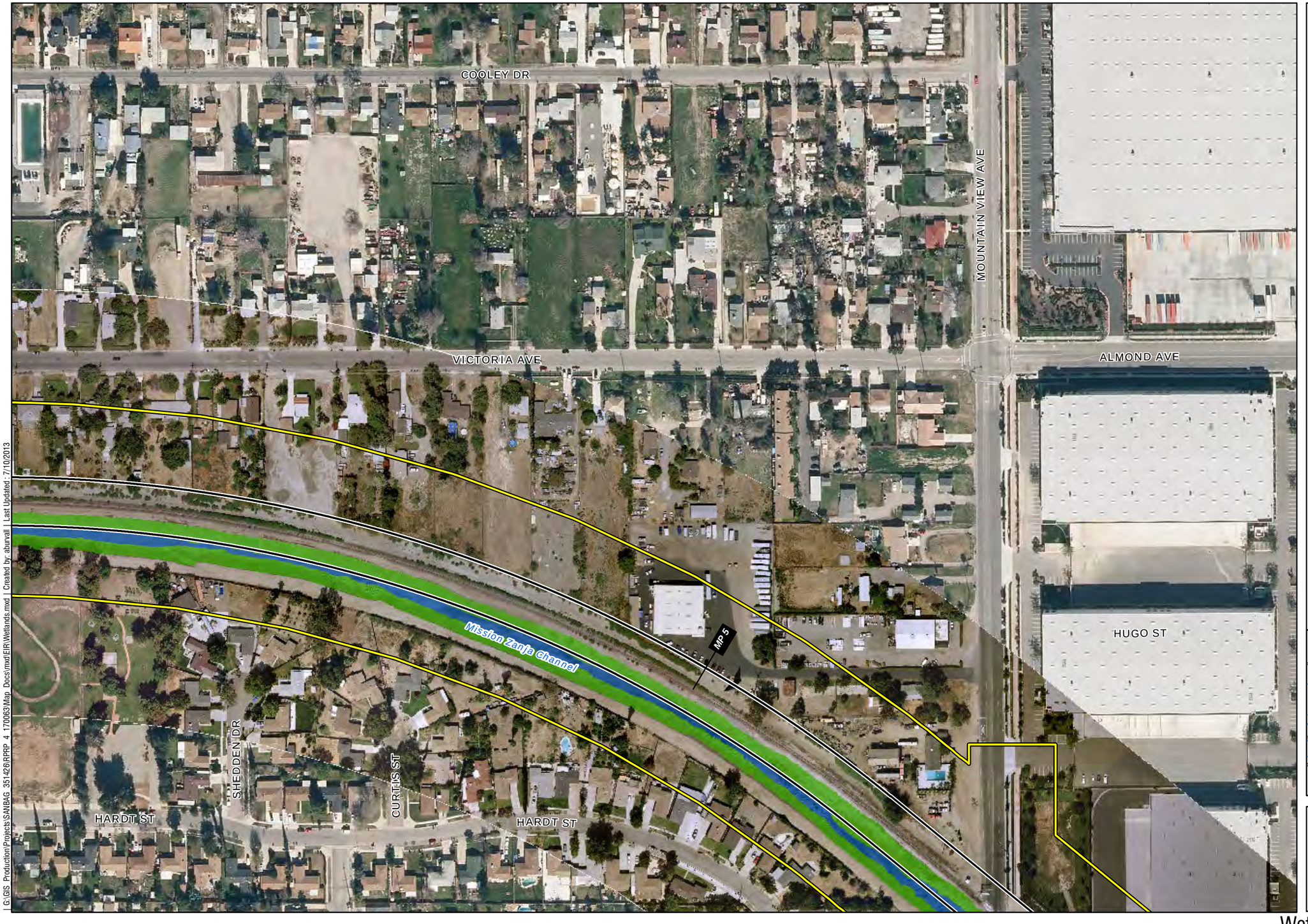


RPRP Study Area

Railroad ROW

Jurisdiction

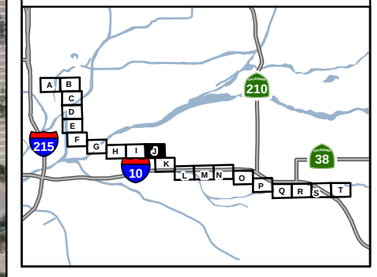
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 J

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RPRP Study Area

Railroad ROW

Jurisdiction

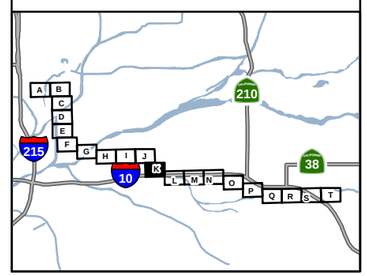
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 K

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RPRP Study Area

Railroad ROW

Jurisdiction

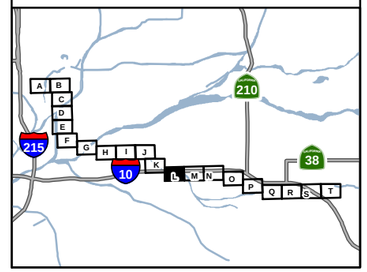
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 L

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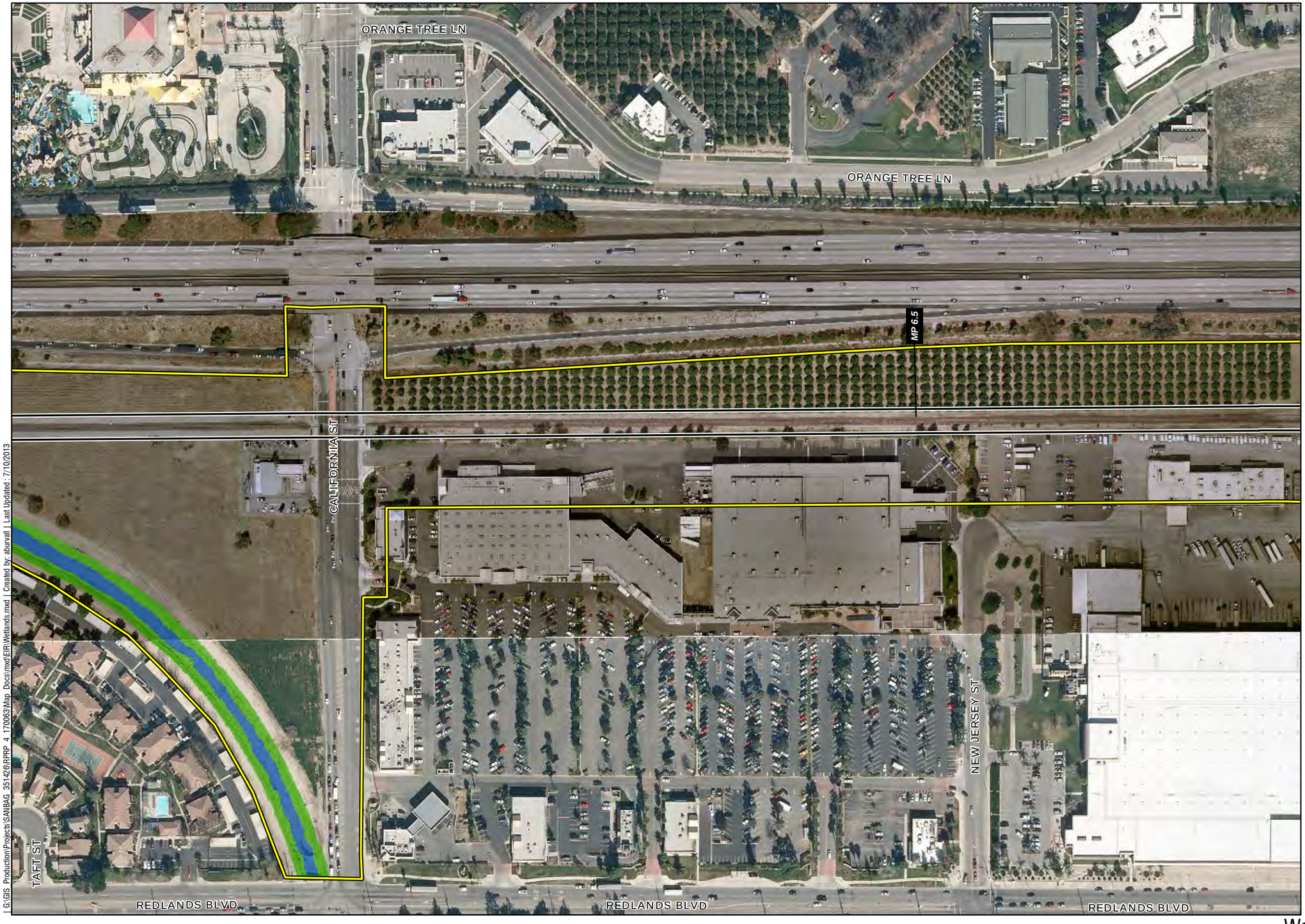


RPRP Study Area

Railroad ROW

Jurisdiction

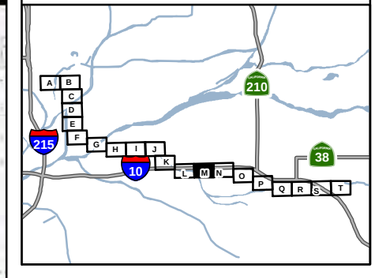
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 M

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RPRP Study Area

Railroad ROW

Jurisdiction

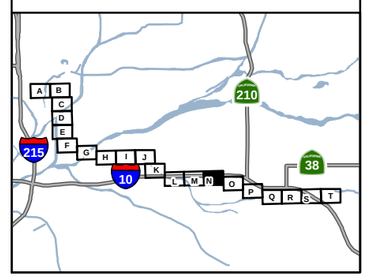
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 N

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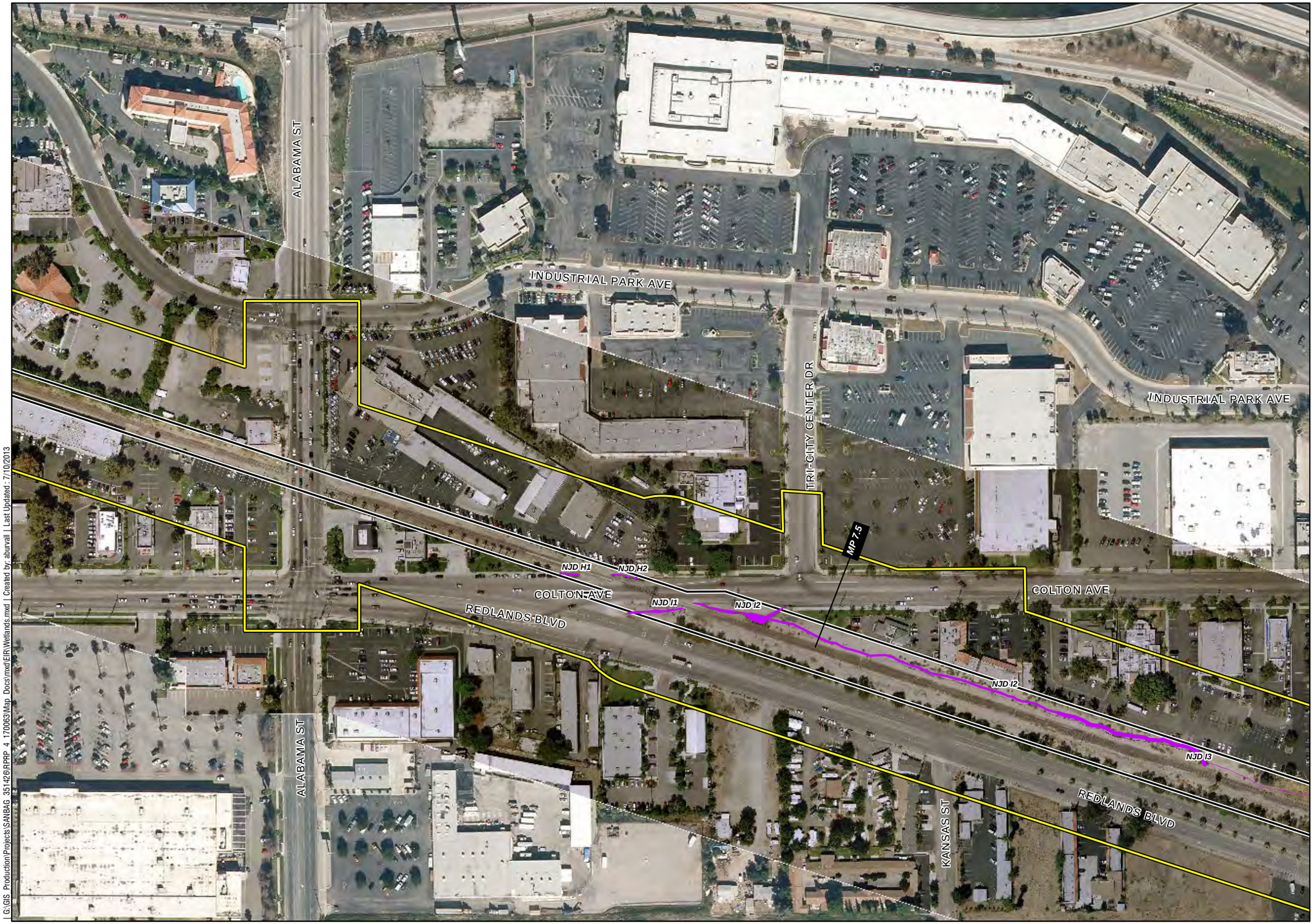


RPRP Study Area

Railroad ROW

Jurisdiction

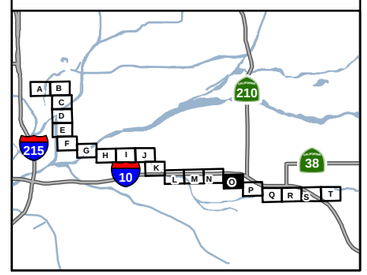
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

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RPRP Study Area

Railroad ROW

Jurisdiction

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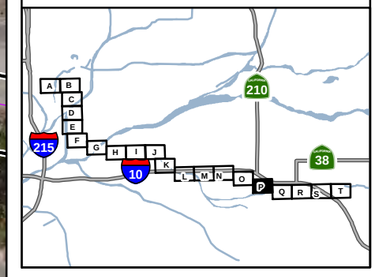
USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 P

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RPRP Study Area

Railroad ROW

Jurisdiction

CDFW

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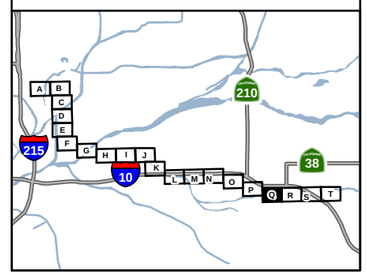
USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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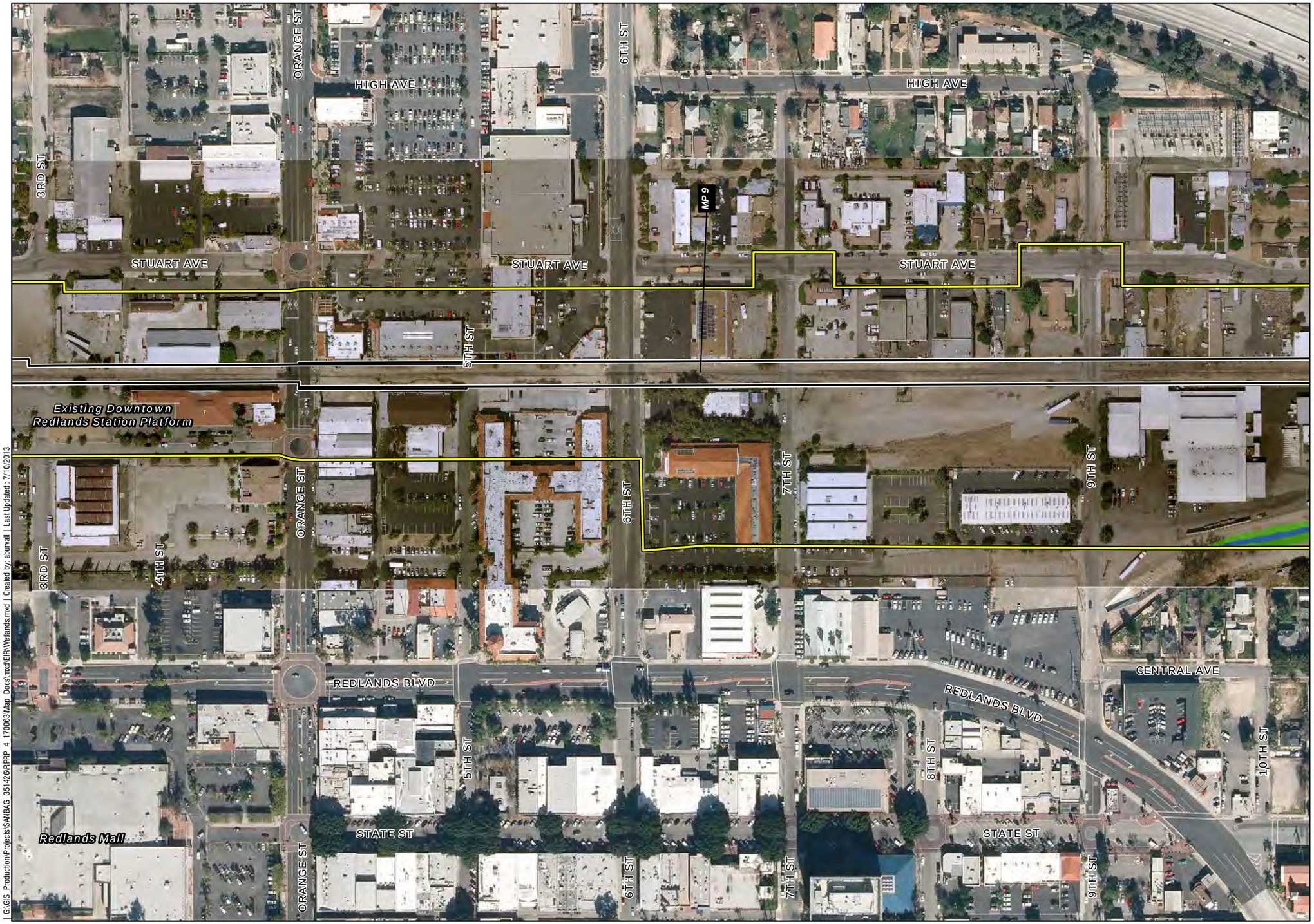
Wetland and Waters of the U.S

Figure 5 Q

FTA/SANBAG | Redlands Passenger Rail Project | JDR

HDR
ONE COMPANY | *Many Solutions*℠



RPRP Study Area

Railroad ROW

Jurisdiction

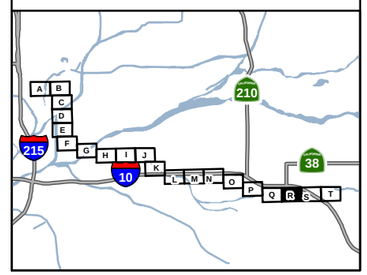
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 R

FTA/SANBAG | Redlands Passenger Rail Project | JDR

RPRP Study Area

Railroad ROW

Jurisdiction

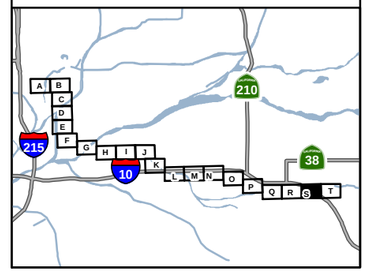
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 S

FTA/SANBAG | Redlands Passenger Rail Project | JDR

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RPRP Study Area

Railroad ROW

Jurisdiction

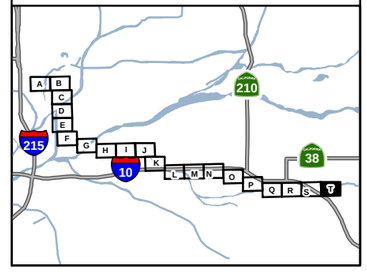
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Wetland and Waters of the U.S

Figure 5 T

FTA/SANBAG | Redlands Passenger Rail Project | JDR

APPENDIX B

Site Photographs
Jurisdictional Waters and Wetlands

Photograph 1. Disturbed habitat.

Photograph 2. North side of Twin Creek. Location of soil pit #3.

Photograph 3. Twin Creek. Southwesterly view. Soil pit #3 is on north side of creek and soil pit #4 is on the south side.

Photograph 4. Eucalyptus woodland habitat.

Photograph 5. Warm Creek. Northerly view.

Photograph 6. Where the Zanja Channel meets the Santa Ana River.

Photograph 7. South side overflow of Santa Ana River. Westerly view.

Photograph 8. Overview of overflow from Santa Ana River.

Photograph 9. Urban/Developed habitat.

Photograph 10. Stormwater from adjacent urban areas channels into the railroad ROW and is transported through a series of culverts into larger drainages.

Photograph 11. Santa Ana River. Westerly view.

Photograph 12. Zanja Channel

Photograph 13. Mill Creek Zanja. Westerly view.

Photograph 14. Mill Creek Zanja. Northwesterly view.

Photograph 15. Soil pit #1.

Photograph 16. Overview of soil pit #1 location.

Photograph 17. Overview of soil pit #2 location.

Photograph 18. Manufactured earthen berm separating the storm water runoff (soil pits #1 and #2) from Zanja Channel .

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APPENDIX C

Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: RPRP City/County: San Bernardino Sampling Date: 2/23/12
Applicant/Owner: BNSF State: CA Sampling Point: Area A (93)
Investigator(s): Allegra Simmons / Sean Harris Section, Township/Range: California Land Grant
Landform (hillside, terrace, fan, etc.): stream bed Local relief (concave, convex, none): none Slope (%): —
Subregion (LRR): C Lat: 34.090421 Long: -117.283442 Datum: WGS 84
Soil Map Unit Name: NWI classification: Riverine
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? NO (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: Significant amount of trash and debris in Area A.
Location: Twin Creek

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Salix lasiolepis	15	N	FACW
2. Baccharis pilularis	25	Y	FAC
3.			
4.			
5.			
Total Cover:	40		
Herb Stratum			
1. Typha sp	25	Y	OBL
2. UNKN grass	10	N	—
3. Veronica anagallis-aquatica	10	N	OBL
4.			
5.			
6.			
7.			
8.			
9.			
Total Cover:	45		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

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:
X Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting date 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: NO BARE ground, all unvegetated areas inundated

SOIL

Sampling Point: Area A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[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 (3)
- X 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]:

- ___ Red Parent Material (TF2)
- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ 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)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation on Aerial Imagery (B7)
- X Water-stained Leaves (B8)
- ___ Biotic Crust (B10)
- ___ Aquatic Invertebrates (B11)
- ___ Crayfish Burrows (B12)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C8)
- X Muck Surface (C7)
- X Saturation on Aerial Imagery (C8)
- ___ Shallow Aquitard (D4)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B9)
- ___ Dry Season Water Table (C3)
- ___ Salt Deposits (C5)
- ___ Mud Casts (C9)
- ___ FAC-Neutral Test (D7)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): _____

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: RPRP City/County: San Bern Sampling Date: 2/22/12
Applicant/Owner: BNSF State: CA Sampling Point: Area B (SP4)
Investigator(s): Allegra Simmons, Sean Harris Section, Township/Range: California Land Grant
Landform (hillside, terrace, fan, etc.): Streambed Local relief (concave, convex, none): NONE Slope (%): 0
Subregion (LRR): C Lat: 34.090181 Long: -117.283402 Datum: WGS 84
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? ND Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? ND (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:
Twin Creek

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix sp	70	Y	FACW
2. Pop fremontii (p. deltoides)	5	N	FAC
3.			
4.			
Total Cover:	75		
Sapling/Shrub Stratum			
1. BAC SAL	20	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:	20		
Herb Stratum			
1. Avena sp	10	Y	NL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
Total Cover:	10		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

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:
X Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting date 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: Area B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[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 (3)
- X 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]:

- ___ Red Parent Material (TF2)
- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ 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 ____

Remarks: Agitation of soil released hydrogen sulfide odor.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation on Aerial Imagery (B7)
- X Water-stained Leaves (B8)
- ___ Biotic Crust (B10)
- ___ Aquatic Invertebrates (B11)
- ___ Crayfish Burrows (B12)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C8)
- X Muck Surface (C7)
- ___ Saturation on Aerial Imagery (C8)
- ___ Shallow Aquitard (D4)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (**B1**) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B9)
- ___ Dry Season Water Table (C3)
- ___ Salt Deposits (C5)
- ___ Mud Casts (C9)
- ___ FAC-Neutral Test (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): _____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No standing water but saturated soils.

Photos 46-53

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: RPPP City/County: San Bernardino Sampling Date: 2/22/12
Applicant/Owner: BRRSF State: Sampling Point: SP 2
Investigator(s): Sara Parkins & Allegra Simonds Section, Township/Range: California Land Grant
Landform (hillside, terrace, fan, etc.): depression @ culvert outlet Local relief (concave, convex, none): Concave Slope (%):
Subregion (LRR): C Lat: 34.073618 Long: -117.264699 Datum: WGS 84
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 X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? NO (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

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Use scientific names.)			
1. Salix lasiolepis	40	Y	FACW
2. Populus fremontii (p. deltoides)	40	Y	FAC
3.			
4.			
Total Cover:	80		
Sapling/Shrub Stratum			
1. Baccharis salicifolia	20	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:	20		
Herb Stratum			
1. Conyza canadensis	10	N	FAC
2. Sorghum halepense	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
Total Cover:	30		
Woody Vine Stratum			
1. Vitis girdiana	40	Y	FAC
2.			
Total Cover:	40		

% Bare Ground in Herb Stratum 2 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 80 % (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 date 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: Old fence-line is creating a berm that is giving rise to wild grape

SOIL

Sampling Point: SP2

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	75	7.5YR 5/6	25	C	M	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 (3)
- ___ 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]:

- ___ Red Parent Material (TF2)
- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ 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)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation on Aerial Imagery (B7)
- ✓ Water-stained Leaves (B8)
- ✓ Biotic Crust (B10)
- ___ Aquatic Invertebrates (B11)
- ___ Crayfish Burrows (B12)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C8)
- ___ Muck Surface (C7)
- ___ Saturation on Aerial Imagery (C8)
- ___ Shallow Aquitard (D4)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B9)
- ___ Dry Season Water Table (C3)
- ___ Salt Deposits (C5)
- ___ Mud Casts (C9)
- ___ FAC-Neutral Test (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Western edge of area has been disturbed. Depression is fed by culvert at E. end + runoff from R.R.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: PPRP City/County: San Bernardino Sampling Date: SP 2

Applicant/Owner: BNSF State: CA Sampling Point:

Investigator(s): AS, SH Section, Township/Range: California Land Grant

Landform (hillside, terrace, fan, etc.): Depressional area Local relief (concave, convex, none): Slope (%):

Subregion (LRR): C Lat: 34.073916 Long: -117.264347 Datum: WGS84

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 X significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? NO (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 X No	

Remarks: Pit taken North of SP 2 in depressional area. Water enters site from adjacent development. Flows have been blocked from connecting with Mission channel by maintained berm.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. TAMARISK FAM	50	Y	FAC
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Johnson grass	15	Y	FACU
2. Sorghum halepense			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
Total Cover:	15		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % 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: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	50	x 3 =	150
FACU species	15	x 4 =	60
UPL species		x 5 =	
Column Totals:	65 (A)		210 (B)

Prevalence Index = B/A = 3.23

Hydrophytic Vegetation Indicators:

_____ Dominance Test is >50%

_____ Prevalence Index is ≤3.0[1]

_____ Morphological Adaptations[1] (Provide supporting date 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 X

Remarks:

SOIL

Sampling Point: SP2

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
0-2	2.5Y 4/2	100	—	—			Silt clay loam	
2-15	5Y 4/3	100	—	—			silt 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 (3)
- ___ 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]:

- ___ Red Parent Material (TF2)
- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ 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)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- X Surface Soil Cracks (B6)
- X Inundation on Aerial Imagery (B7)
- ___ Water-stained Leaves (B8)
- ___ Biotic Crust (B10)
- ___ Aquatic Invertebrates (B11)
- ___ Crayfish Burrows (B12)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C8)
- ___ Muck Surface (C7)
- ___ Saturation on Aerial Imagery (C8)
- ___ Shallow Aquitard (D4)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B9)
- ___ Dry Season Water Table (C3)
- ___ Salt Deposits (C5)
- ___ Mud Casts (C9)
- ___ FAC-Neutral Test (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

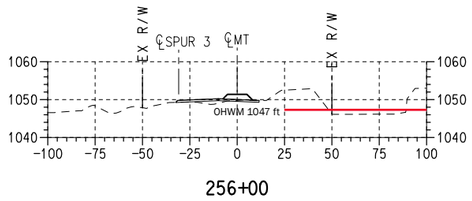
Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Out flow blocked by maintained Berm - would otherwise flow to Mission channel. flows coming from offshoot of SANTA ANA River to North

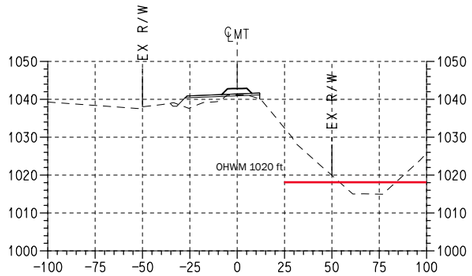
APPENDIX D

Topographic Cross Sections & OHWM



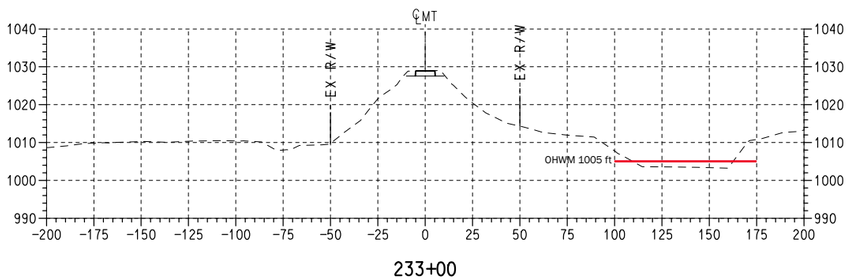
256+00

Mission Zanja Flood Control Channel - Mile Post 3.95



247+00

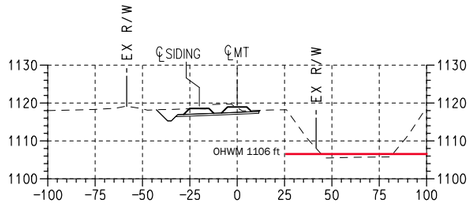
Mission Zanja Flood Control Channel - Mile Post 3.75



233+00

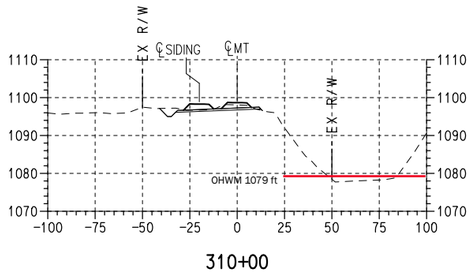
Mission Zanja Flood Control Channel (Mouth) - Mile Post 3.5

Exhibit D1. Channel Cross-Sections and OHWM



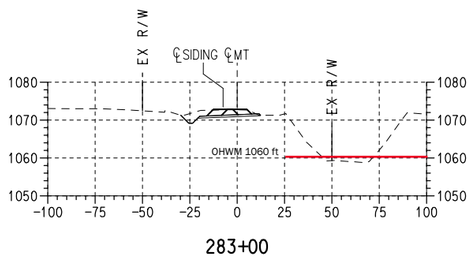
335+00

Mission Zanja Flood Control Channel - Mile Post 5.5



310+00

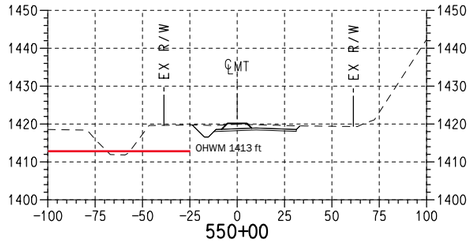
Mission Zanja Flood Control Channel - Mile Post 5



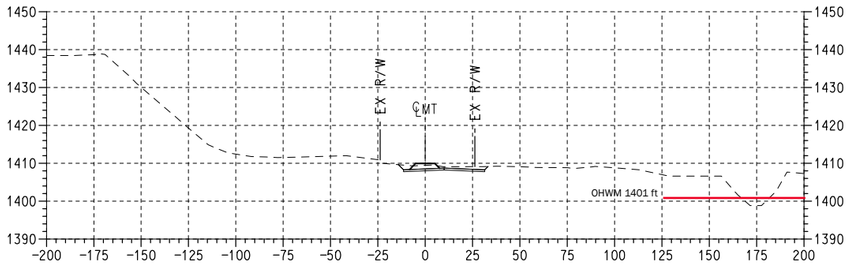
283+00

Mission Zanja Flood Control Channel - Mile Post 4.5

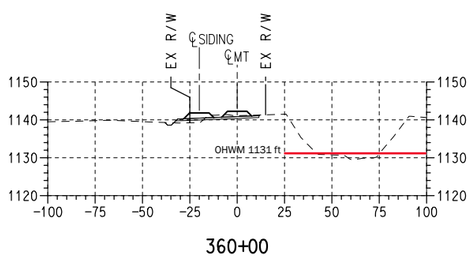
Exhibit D2. Channel Cross-Sections and OHWM



Mission Creek Zanja - Mile Post 9.5

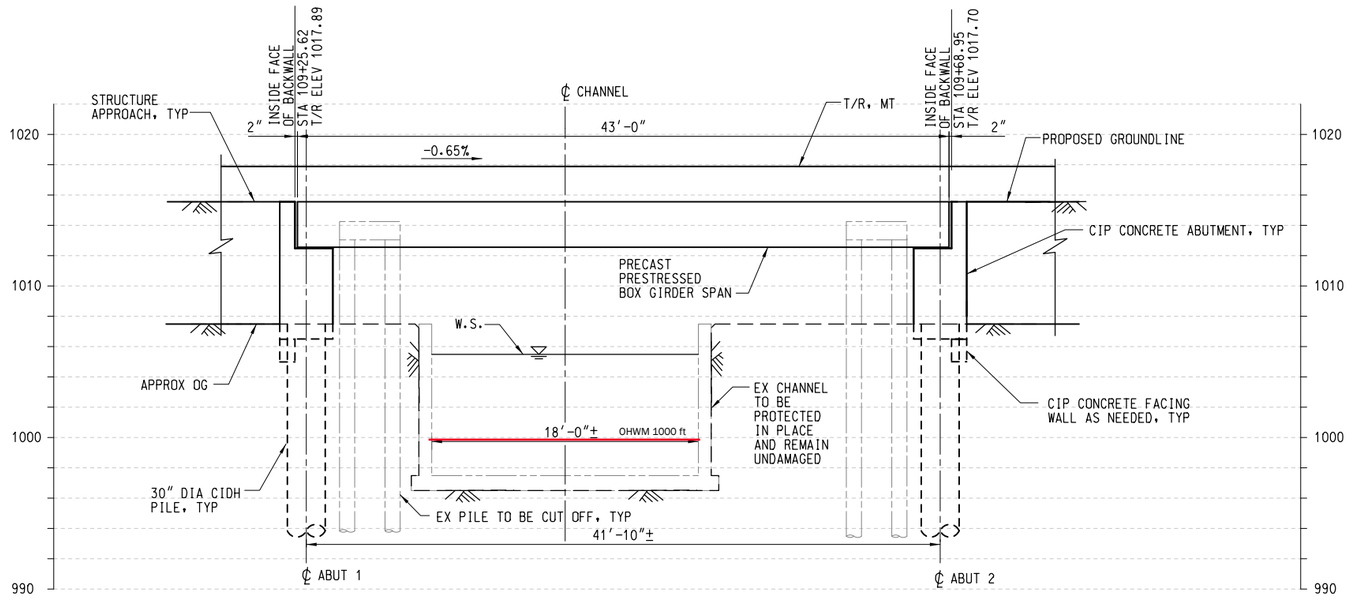


Mill Creek Zanja - Mile Post 9.3 (approx.)



Mission Zanja Flood Control Channel - Mile Post 5.9 (approx.)

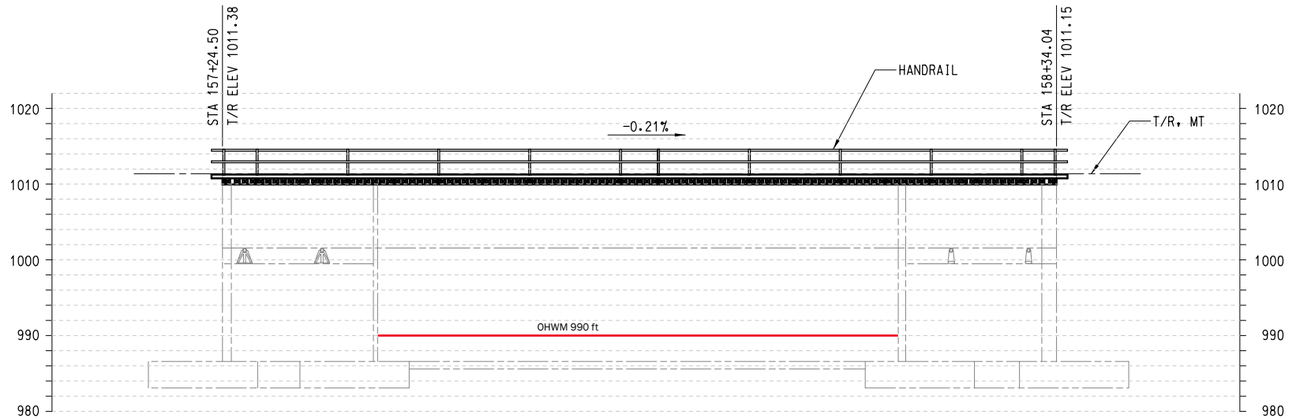
Exhibit D3. Channel Cross-Sections and OHWM



BRIDGE 1.1 - ELEVATION

SCALE: 1"=5'-0"

Warm Creek (Historic)



BRIDGE 2.2 - ELEVATION

SCALE: 1"=10'-0"

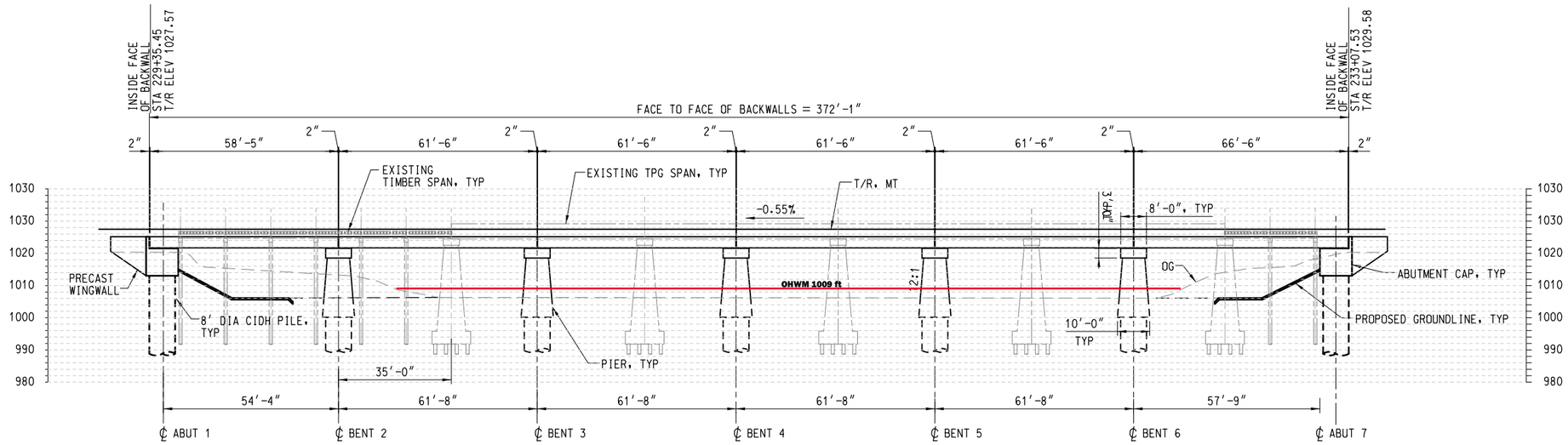
Twin Creek

LEGEND

EXISTING STRUCTURE

NEW STRUCTURE

Exhibit D4. Channel Cross-Sections and OHWM



BRIDGE 3.4 ELEVATION

SCALE: 1"=20'-0"

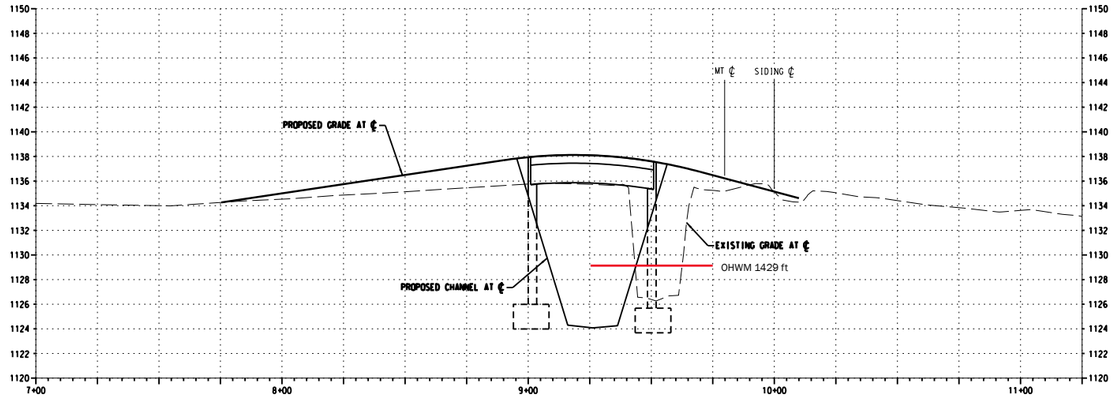
Santa Ana River

LEGEND

EXISTING STRUCTURE

NEW STRUCTURE

Exhibit D5. Channel Cross-Sections and OHWM

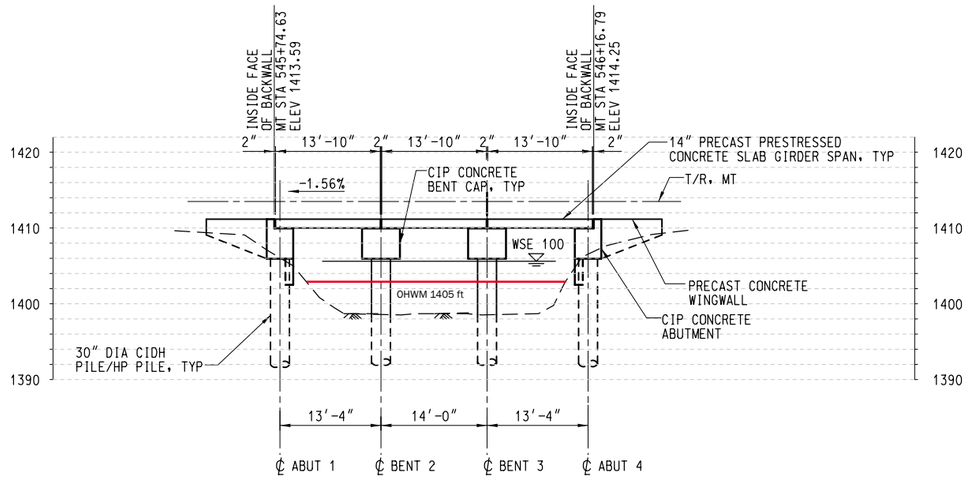


Bridge 5.78 - Bryn Mawr Avenue
Mission Zanja Channel

LEGEND

EXISTING STRUCTURE

NEW STRUCTURE



BRIDGE 9.4 ELEVATION

SCALE: 1"=10'-0"

(NORMAL TO ℄ CHANNEL)

Mill Creek Zanja

APPENDIX E

USACE Aquatic Resources Spreadsheet

Waters_Name	Cowadin_Code	HGM_Code	Measurement_Type	Amount	Units	Waters_Types	Latitude	Longitude	Local_Waterway
NJD A1	U	slope	area	0.048392	ACRE	UPLAND	34.099703	-117.295621	unnamed
NJD A2	U	slope	area	0.011677	ACRE	UPLAND	34.099806	-117.292691	unnamed
NJD A3	U	slope	area	0.013096	ACRE	UPLAND	34.099848	-117.290939	unnamed
NJD B	U	slope	area	0.246098	ACRE	UPLAND	34.073846	-117.266153	unnamed
NJD C	U	slope	area	0.528106	ACRE	UPLAND	34.073632	-117.197716	unnamed
NJD D	U	slope	area	0.007323	ACRE	UPLAND	34.07023	-117.242046	unnamed
NJD E	U	slope	area	0.05148	ACRE	UPLAND	34.066212	-117.23545	unnamed
NJD F	U	slope	area	0.013934	ACRE	UPLAND	34.066208	-117.217928	unnamed
NJD G1	U	slope	area	0.11483843	ACRE	UPLAND	34.065019	-117.213966	unnamed
NJD G2	U	slope	area	0.007579	ACRE	UPLAND	34.064637	-117.212573	unnamed
NJD H1	U	slope	area	0.003383	ACRE	UPLAND	34.062977	-117.206985	unnamed
NJD H2	U	slope	area	0.003249	ACRE	UPLAND	34.062963	-117.206607	unnamed
NJD I1	U	slope	area	0.013048	ACRE	UPLAND	34.062764	-117.206414	unnamed
NJD I2	U	slope	area	0.164952	ACRE	UPLAND	34.062744	-117.203894	unnamed
NJD I3	U	slope	area	0.018452	ACRE	UPLAND	34.061539	-117.20145	unnamed
NJD I4	U	slope	area	0.053115	ACRE	UPLAND	34.060911	-117.199357	unnamed
NJD J1	U	slope	area	0.050988	ACRE	UPLAND	34.060267	-117.19636	unnamed
NJD J2	U	slope	area	0.02093	ACRE	UPLAND	34.059329	-117.192981	unnamed
Mill Creek Zanja	R4SB3	riverine	area	0.54576129	ACRE	RPW	34.058978	-117.172128	Mill Creek Zanja
Mission Zanja Flood Control Channel	R4SB3	riverine	area	8.64491012	ACRE	RPW	34.073778	-117.194519	Mission Zanja Flood Control Channel
Santa Ana River	R4SB4	riverine	area	5.135647	ACRE	RPW	34.075837	-117.270306	Santa Ana River
Twin Creek	R4SB (Concrete)	riverine	area	2.0674	ACRE	RPW	34.090557	-117.283157	Twin Creek
Warm Creek (Historic)	R4SB	riverine	area	0.349912	ACRE	RPW	34.099875	-117.2906	Warm Creek (Historic)
Twin Creek Wetland	R4SB7	riverine	area	0.046208	ACRE	RPWWD	34.0905	-117.283226	Twin Creek

APPENDIX F

Non-Jurisdictional Attribute Data

Non-Jurisdictional Drainage Information											
							Surface Runoff				
Non-Jurisdictional Drainages	Map Page	Surface / Subsurface Connectivity (Y/N)	Typical Flow Regime	Channel Type	Water Type (Uplands or Natural Drainage)	Percent Developed	Sheet-Flow Inputs	Dry Weather Urban Runoff Inputs	Upstream Natural Water Runoff Inputs	Drainage Area (Acres)	Discahrge Point
NJD A1	5A	No	Seasonal	Earthen Ditch - See Photo (F1)	Uplands - See Figure F1	< 15%	Yes	Yes	No	4.4	Storm Drain
NJD A2	5A	No	Seasonal	Earthen Ditch - See Photo (F2)	Uplands - See Figure F1	76%	Yes	Yes	No	32.9	Storm Drain
NJD A3	5A	No	Seasonal	Concrete Spillway- See Photo (F3)	Uplands - See Figure F1	76%	Yes	Yes	No	4.3	Spillway
NJD B	5G	No	Seasonal	Earthen Ditch - See Photo (F4)	Uplands - See Figure F2	76%	Yes	Yes	No	5.0	Enclosed Basin
IW1	5H	No	Perenial	Isolated Wetland - See Photo (F5)	Uplands - See Figure F2	76%	Yes	Yes	No	2.1	Enclosed Basin
NJD C	5I	No	Seasonal	Earthen Ditch - See Photo (F6)	Uplands - See Figure F2	85%	Yes	Yes	No	3.5	Storm Drain
NJD D	5K	No	Seasonal	Concrete Ditch - See Photo (F7)	Uplands - See Figure F3	76%	Yes	Yes	No	9.4	Storm Drain
NJD E	5L	No	Seasonal	Concrete Ditch - See Photo (F8)	Uplands - See Figure F3	76%	Yes	Yes	No	193.8	Storm Drain
NJD F	5N	No	Seasonal	Concrete Ditch - See Photo (F9)	Uplands - See Figure F3	76%	Yes	Yes	No	142.4	Storm Drain
NJD G1	5N	No	Seasonal	Earthen Ditch - See Photo (F10)	Uplands - See Figure F3	76%	Yes	Yes	No	10.0	Storm Drain
NJD G2	5N	No	Seasonal	Earthen Ditch - See Photo (F11)	Uplands - See Figure F3	76%	Yes	Yes	No	9.2	Storm Drain
NJD H1	5O	No	Seasonal	Earthen Ditch - See Photo (F12)	Uplands - See Figure F3	76%	Yes	Yes	No	0.5	Storm Drain
NJD H2	5O	No	Seasonal	Earthen Ditch - See Photo (F13)	Uplands - See Figure F3	76%	Yes	Yes	No	23.6	Storm Drain
NJD I1	5O	No	Seasonal	Earthen Ditch - See Photo (F14)	Uplands - See Figure F3	65%	Yes	Yes	No	32.2	Storm Drain
NJD I2	5O	No	Seasonal	Concrete Ditch - See Photo (F15)	Uplands - See Figure F3	53%	Yes	Yes	No	29.4	Storm Drain
NJD I3	5P	No	Seasonal	Earthen Ditch - See Photo (F16)	Uplands - See Figure F3	90%	Yes	Yes	No	28	Storm Drain
NJD I4	5P	No	Seasonal	Earthen Ditch - See Photo (F17)	Uplands - See Figure F3	15%	Yes	Yes	No	0.4	Storm Drain
NJD J1	5P	No	Seasonal	Earthen Ditch - See Photo (F18)	Uplands - See Figure F3	23%	Yes	Yes	No	41.6	Storm Drain
NJD J2	5P/Q	No	Seasonal	Earthen Ditch - See Photo (F19)	Uplands - See Figure F3	41%	Yes	Yes	Yes	6.2	Storm Drain


NJD A1


NJD A2


DANGER
NJD A3


NJD B


IW1


Worldwide Services
NJD C


NJD D


NJD E


NJD F


NJD G1


NJD G2


NJD H1


NJD H2


NJD I1


NJD I2


DYNASTY
SUITES
NJD I3


NJD I4


NJD J1


NJD J2

SAN BERNARDINO

NJD A2

NJD A3

NJD A1

NJD B

NJD C

IW1

NJD D
NJD E
NJD F
NJD G2
NJD H2
NJD I2
NJD I4
NJD J2
NJD G1
NJD H1
NJD I3
NJD I1
NJD J1
Santa Ana River
Well
Oil
STREET
AVE
Marigold
1219
1200
BDY
PIONEER
16
15
ST
Oil
STREET
ANA
14
13
REDLANDS
1158
SAN BERNARDINO
1227
PACIFIC
ELECTRIC
Oil
Crown Jewel
Reservoir
ALABAMA
Oil
Sunkist
BM 1399
AVE
1440
1409
23
AVE
1500
24
22
1320
Christian Sch
University of Redlands
Oil
Well
Oil
Nevada
A T & S
GRANT
RANGE
TEXAS
Drive-in Theater
1114
COLTON
1161
4 LANE
AVE
1213
Mission Sch
Lincoln Sch
BDY
REDLANDS
COLTON
Park
BM 1537
Warner
VIEW
MTN
San Timoteo
CALIFORNIA
S P
City Hall
1487
CITRUS
HS
BM 1150
GRANT
BDY
1200
Bryn Mawr
BM 1202
San Gabriel Mission
Oil
Asist
1280
BROOKSIDE
AVE
P O
CENTER
AVE
CAJON
RESERVOIR
AVE
FIFTH
ST
Pumps
SOUTHERN
FERN
BM 1381
34
PALM
ST
HIGHLAND
36
31
32
33
35
36
BEAUMONT
BM1248
AVE
Wash
Hosp
Redlands (Siding)
Gaging
Redlands Heights
Reservoir

Biological Assessment
REDLANDS PASSENGER RAIL PROJECT
Redlands, San Bernardino County, California

November 2013

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1.0 INTRODUCTION

This Biological Assessment (BA) has been prepared for the Redlands Passenger Rail Project (RPRP or proposed action), located in San Bernardino County, CA. In accordance with the requirements of 50 CFR Section 402(12), the purpose of this BA is to evaluate the potential effects of constructing the proposed action on listed and proposed species and designated and proposed critical habitat and determine whether any such species or habitat are likely to be adversely affected by the proposed action.

1.1 REGULATORY SETTING

Federal Endangered Species Act

The federal ESA defines and lists *species* as "endangered" or "threatened" and provides regulatory protection for the listed species. The federal ESA provides a program for conservation and recovery of threatened and endangered species. It also ensures the conservation of designated critical habitat that the USFWS has determined is required for the survival and recovery of these listed species. Section 9 of the federal ESA prohibits the "Take" of species listed by USFWS as threatened or endangered. *Take* is defined as: "…to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." In recognition that *Take* cannot always be avoided, Section 10(a) of the federal ESA includes provisions for *Take* that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) permits (incidental take permits) may be issued if *Take* is incidental and does not jeopardize the survival and recovery of the species.

Section 7(a)(2) of the federal ESA requires that all federal agencies, including the USFWS, evaluate projects with respect to any species proposed for listing or already listed as endangered or threatened and any proposed or designated critical habitat for the species. Federal agencies must undertake programs for the conservation of endangered and threatened species and are prohibited from authorizing, funding, or carrying out any action that will jeopardize a listed species or destroy or modify its critical habitat.

As defined in the federal ESA, individuals, organizations, states, local governments, and other nonfederal entities are affected by the designation of critical habitat only if their actions occur on federal lands; require a federal permit, license, or other authorization; or involve federal funding (USFWS 2011).

The proposed action does not occur within an approved Habitat Conservation Plan (HCP). Therefore, potential impacts to threatened or endangered species, as considered by the USFWS, are not covered under an existing HCP. Consequently, should any listed species be detected during the associated focused species surveys, incidental take permits would need to be obtained.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 (42 United States Code Section 4321-4347) is a Federal statute requiring the identification and analysis of potential environmental effects associated with proposed Federal actions before those actions are taken. The intent of NEPA is to help decision makers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. The process for implementing NEPA is outlined in Title 40 of the Code of Federal Regulations (CFR), Parts 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*.

The Federal Transit Administrative (FTA), Region 9, is the federal lead agency under NEPA for the proposed action. As a federal agency, FTA must meet NEPA requirements whenever it is the FTA's decision that would result in an impact on the human environment, even if the impact would be beneficial and regardless of who proposes the action or where it would take place (40 CFR 1508.18). FTA is requiring the preparation of an Environmental Impact Statement (EIS) for the proposed action to fulfill the requirements of NEPA, and consultation with USFWS is being performed as part of the EIS process.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 Code of Federal Regulations (C.F.R.) Part 10, including feathers, or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 C.F.R. 21).

Section 404 Permit (Clean Water Act)

The Clean Water Act establishes a program to regulate the discharge of dredge and fill material into waters of the U.S. including wetlands. Activities regulated under this program include fills for development, water resource projects (e.g., dams and levees), infrastructure development (e.g., highways and airports), and conversion of wetlands to uplands for farming and forestry. Either an individual 404(b) permit or authorization to use an existing USACE Nationwide Permit will need to be obtained if any portion of construction requires fill into a river, stream, or stream bed that has been determined to be a jurisdictional waterway. When applying for a permit, a company or organization must show that they would avoid wetlands when practicable, minimize wetland impacts, and provide compensation for any unavoidable destruction of wetlands (CWIS 2007). Section 404 also requires that USACE consult with USFWS under Section 7 of the ESA prior to issuing a permit approval. For the proposed action, USACE has provided concurrence that FTA lead the Section 7 consultation process with USFWS due to its federal lead agency responsibility under NEPA.

Section 401 Water Quality Certification (Clean Water Act)

The Clean Water Act protects water quality by regulating the dumping or flow of pollutants into streams, lakes, and rivers. A water quality certification, obtainable in California through the State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCB), must be obtained in order to receive a 404 permit or be authorized under the 404 nationwide permits (USEPA 2011).

1.2 CONSULTATION HISTORY

On May 1, 2013, FTA sent a letter to USFWS requesting initiation of formal Section 7 consultation to address impacts from the proposed action under the ESA. The USFWS received the draft biological technical report on May 28, 2013. A site visit at the proposed action location was conducted on July 15, 2013 and was attended by staff from USFWS, the California Department of Fish and Wildlife (CDFW), and project representatives from HDR and the San Bernardino Associated Governments (SANBAG). During the field visit, HDR and SANBAG provided an overview of the proposed action, walked sensitive habitats with USFWS and CDFW, and discussed additional information necessary for the USFWS to initiate formal Section 7 consultation. On August 9, 2013, USFWS submitted a letter to FTA outlining additional information required to complete the Section 7 initiation package, including the following:

- A Final Biological Technical Report (BTR), which was sent to USFWS on July 24, 2013;
- Concurrence from the U. S. Army Corps of Engineers (USACE) that FTA will act as the lead Federal agency for the Section 7 Consultation. This concurrence was provided to FTA in an email from USACE on August 21, 2013;
- A Biological Assessment (BA);
- A discussion of hydrological effects within Santa Ana River during construction and post-construction, which is included in this BA;
- Avoidance/Minimization Measures for Santa Ana River woolly star, which are included in this BA; and
- A Habitat Management Plan (HMP), which is included in Section 4 of this BA.

This BA is intended to satisfy the additional information requested by USFWS in its August 9, 2013 letter.

2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 PROPOSED ACTION

2.1.1 LOCATION OF PROPOSED ACTION

The proposed action extends from the City of San Bernardino east to the City of Redlands within southwestern San Bernardino County, California (Appendix C, Figure 1). The proposed action limits include the existing track and right-of-way along with adjacent areas beginning at E Street in San Bernardino and extending east to the University of Redlands, just east of University Avenue (Appendix C, Figures 2a and 2b). The Action area starts just west of Mile Post (MP) 1, east of E Street within the City of San Bernardino and ends at MP 10.1 at the University of Redlands (Appendix C, Figure 3). The western endpoint of the Action area roughly corresponds with 472625.405003 meters (m) East and 3773265.404 m North (WGS 84 UTM 11N). The eastern end of the Action area corresponds with 485190.263559 m East and 3768624.11534 m North (WGS 84 UTM 11N).

Five major water crossings occur within the Action area. The western-most water crossing occurs at Warm Creek (Historic) at approximately MP 1.1. Further east, the railroad corridor crosses Twin Creek at approximately MP 2.2. At MP 3.4, the railroad corridor crosses the Santa Ana River. East of the Santa Ana River, the Action area parallels the Mission Zanja Flood Control Channel for approximately 2.6 miles (MP 3.4 to MP 6.0). At MP 5.78, the Bryn Mawr Avenue crosses the Mission Zanja Flood Control Channel and intersections with the railroad corridor. Further east, the railroad corridor crosses the Mill Creek Zanja at MP 9.4.

2.1.2 DESCRIPTION OF PROPOSED ACTION

The Redlands Passenger Rail Project (RPRP or proposed action) would involve the implementation of rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. Appendix C, Figure 3 depicts the location of the proposed action.

Construction of the proposed action would occur within an existing railroad right-of-way (ROW) owned by the San Bernardino Associated Governments (SANBAG). SANBAG's ROW averages 50 to 100 feet in width with the exception of portions of downtown Redlands where the ROW measures less than 40 feet. Additional details regarding each of the components comprising the proposed action and associated operations are described under the following subheadings.

Track Improvements

The proposed action would include the construction of track improvements to facilitate train movements along a single track through the rail corridor with an approximately 10,000-foot-long section of passing track or siding, from just west of Richardson Street to just east of California Street (MP 5.5 to MP 7.4)(Appendix C, Figures 3E and 3F). The proposed track ballast and sub-grade along the 9-mile corridor would be constructed to 50 feet in width, sufficient to support a parallel maintenance road. In downtown Redlands, this width would be reduced to less than 40 feet in recognition of the constrained ROW. This would require demolition and replacement of the existing track. The rail improvements would also include the construction of a new train signaling and communications system.

Structural Crossings and Bridges

The proposed action would require the replacement or retrofitting of up to six structural crossings to facilitate the loading requirements of the passenger trains and track foundation. These structural crossings consist of existing bridge structures located at Warm Creek (Historic) at MP 1.1; Twin Creek at MP 2.2; the Santa Ana River (SAR) at MP 3.4; the Gage Canal at MP 3.8; Bryn Mawr Avenue at MP 5.78; and Mill Zanja Creek at MP 9.4. Figures 3A, 3B, 3D, 3F, and 3J illustrate the extent of these improvements.

Construction of the structural crossings at local waterways, including the SAR, may require the isolation of the work zone through the installation of a cofferdam and/or construction work pads within the wet area. New structural supports would be constructed behind a temporary cofferdam constructed of sheet piling or similar method, such as the use of cast-in-steel-shell (CISS) piles. The structural foundation would consist of a reinforced concrete supported by piling, with conventional reinforced concrete piers extending up to the bridge decks.

Roadway Grade Crossings and Signaling

The Action area traverses 32 existing roadway grade crossings including two I-10 underpasses. Roadways grade crossing not subject to closure would be re-designed in accordance with the latest *Grade Crossing Design* guidelines that require in certain cases raised medians, widened sidewalks, traffic striping, flashing lights, pedestrian gate arms where requested by the California Public Utilities Commission (CPUC), and swing gates.

Proposed Rail Platforms

There are currently five (5) station stops proposed for the proposed action with new rail platforms proposed at four (4) locations. Two (2) station stops (E Street and Tippecanoe Avenue or Waterman Avenue) would be located in the City of San Bernardino, while the other three (3) (New York Street, Downtown Redlands, and the University of Redlands) would be located in the City of Redlands. Figures 3A, 3C, 3D, 3H, 3I, and 3J illustrate the location for each of the proposed stations. The E Street Rail Platform would be constructed in conjunction with the already approved Downtown San Bernardino Passenger Rail Project (DSBPRP) and, therefore, only track improvements would be required west of E Street to align the tracks with the planned rail platforms.

Rail platforms would in most instances be less than 200 feet long[1]. Pedestrian crossovers would be provided for each platform with accessible parking provided adjacent to pedestrian crossovers.

Train Layover Facility

The proposed action would require the development of a new Train Layover Facility to include sufficient storage tracks for maintenance activities and operational activities including offices, training rooms, and a crew break room. The Train Layover Facility would be constructed on a long narrow site immediately south of I-10 and west of California Street and would contain up to seven spur tracks (Appendix C, Figure 3F).

Utility Replacement and Relocation

The proposed action would likely necessitate the relocation of existing subsurface and overhead crossing utilities (i.e., water, sewer, storm drain, power, gas, fiber optic, and telephone lines) in accordance with applicable utility accommodation design criteria and engineering standards. The exact method of improvement, if required, would be determined in coordination with the affected utility provider in conjunction with the proposed action's final design.

Drainage

Several drainage facility improvements would be necessary to accommodate the proposed action. It is anticipated that a majority of the storm drain facilities would be protected in place and would not need to be lowered to meet minimum depth requirements. However, it is likely that the majority of the storm drain casings within the rail ROW would need to be extended to span the entire width of the rail ROW. These improvements would be coordinated with the cities of San Bernardino and Redlands along with San Bernardino County Flood Control District (SBCFCD). In addition, longitudinal storm drain lines

[1] A minimum of 170 feet is required to accommodate two 85-foot Bombardier passenger coaches.

located within the rail corridor would need to be relocated further from the proposed track centerlines to comply with BNSF engineering standards.

Mission Zanja Channel Improvements. Mission Zanja Flood Control Channel runs parallel to the rail line from the SAR to approximately 900 feet west of California Street for a distance of approximately 2.6 miles where it diverges from the Action Area to the south (Appendix C, Figures 3D through 3F). At approximately milepost 9.4 (Bridge 9.4), the creek rejoins the railroad further east, as Mill Creek Zanja , where it passes under the railroad just west of the I-10 overcrossing.

Mission Zanja Channel is characterized as an improved, trapezoidal earthen channel with some segments including wire revetment (USACE, 1994). To ensure the structural integrity of the track improvements along sections of Mission Zanja Channel, the proposed action may include bank stabilization improvements (e.g., armoring, slope keying, etc.) to sections of the northern bank of the Mission Zanja Channel, from MP 3.5 to just east of MP 6, to ensure that the bank is able to support the additional loading requirements and withstand scour during high flow events. At this time, SANBAG is considering the use of an articulated concrete block (ACB) to support the armoring of the northern bank, which would allow for the growth of limited vegetation. This improvement would be coordinated and constructed with the SBCFCD, which maintains the Mission Zanja Channel.

Maintenance

Maintenance of the railroad ROW is currently the responsibility of BNSF, which is the current operator of the rail line. This includes routine maintenance of the track and track ties, grade crossings, and communication system. Vegetation management and weed abatement would also be required along the ROW. Each platform would also require routine landscaping and facility maintenance (e.g., replacement of lighting fixtures). Typical railroad maintenance and inspections would be conducted by a contractor hired by SANBAG throughout the operational phase of the proposed action in accordance with SCRRA/Metrolink and BNSF standard practices.

Construction

Construction of the proposed action would begin in 2015 and take up to 36 months to complete. Construction would proceed generally from the west of E Street to the SAR and similarly from the SAR east to Cook Street. Construction scheduling and phasing would ultimately be at the discretion of SANBAG's contractor. A description of anticipated construction activities over the course of the proposed action is provided as follows:

- Construction easement acquisition, clearing and grubbing, and removal of existing track;
- Relocate, extend, or encase utilities, as appropriate, to remove conflicts;
- Construct embankments, culvert extensions, an retaining walls for the proposed rail corridor, as necessary;
- Re-grade, install drainage, and construct bridge crossings, including as appropriate, new, standard height parapets on both sides of each bridge, construct in-fill walls, plug deck drains, construct new spread footings at each pile, and seal parapet joints;
- Construct new rail platforms at proposed rail platform locations and layover facility; and,
- Construct new continuous welded rail track, roadway grade crossings, and install pedestrian access improvements and landscaping, where appropriate.

These activities would likely overlap at times. Staging areas for construction equipment and materials would be located primarily within the SANBAG ROW to the extent feasible. In addition, a part of the proposed layover facility would be used as a centralized construction staging area for heavy equipment

due to its centralized location along the rail corridor. The total construction area for the proposed action is estimated at 137.3 acres.

2.1.3 PURPOSE AND NEED

The overall purpose of the proposed action is to provide a cost-effective, alternative travel option for communities located along the Redlands Corridor in a way that maintains freight service and improves transit mobility, travel times, and corridor safety while minimizing adverse environmental impacts. The proposed action would provide travelers and commuters with a new mobility option within a dedicated ROW that would be capable of achieving shorter travel times than automobiles while facilitating the continuation of existing freight service along the rail corridor consistent with SANBAG's purchase agreement with the BNSF Railroad. Through implementation of the proposed action, SANBAG would provide new passenger rail service to the communities of Redlands, Loma Linda, and San Bernardino.

The proposed action would assist SANBAG and the State of California in meeting the air pollution and greenhouse gas emission reduction targets as mandated under Assembly Bill (AB) 32, known as the Global Warming Solutions Act of 2006, and, Senate Bill (SB) 375, known as the California's Sustainable Communities and Climate Protection Act of 2008. These two laws establish the basis for both SCAG and SANBAG to accommodate regional growth through increased access to alternative modes of transit for local communities. The proposed action would further the objectives of these two statutes by expanding local transit opportunities.

2.2 AVOIDANCE AND MINIMIZATION MEASURES

Construction of the structural crossings at local waterways, including the SAR, may require the isolation of the work zone through the installation of a cofferdam and/or construction work pads within the wet area. The project's Storm Water Pollution Prevention Plan (SWPPP) would identify Best Management Practices (BMPs) to address potential short-term impacts and post-construction (long-term) measures to be implemented for the proposed action. Stormwater pollution prevention BMPs included as a part of the SWPPP would be implemented in accordance with the California Stormwater Construction Handbook (latest edition) and the Construction General Permit Order No. 2009-0009-DWQ.

To minimize construction activity in the channel and maintain a passage for wildlife and storm flows, structural bridge improvements would be constructed in two or more phases . A similar approach would be employed for the removal of any existing structures. To minimize the sedimentation, in-channel construction activities would be limited to the period between April 15 and October 15 to the extent feasible. To minimize the potential for falling debris into local waterways during bridge construction, a debris containment system would be installed under the bridge to catch any falling debris. If flow is present and as an additional precaution, a boom would be strung across the water feature to keep any material that escapes the containment system from being carried down stream.

2.3 EXISTING CONDITIONS

2.3.1 DEFINITIONS

The following definitions are used to describe the location of the various survey activities conducted during on-site fieldwork:

- ***Project footprint*** is defined as the limits of impacts associated with full build-out of the proposed action. The Project footprint is synonymous with the proposed action's construction footprint (or direct impacts), which is estimated at 137.3 acres.
- ***Action area*** is defined as the area within 200 feet on either side of the centerline of the existing rail corridor that was mapped and evaluated for potential direct and indirect impacts to biological resources. In several instances, additional areas were added to the Action area to include entire

properties given uncertainties related to the actual placement of physical improvements. The Action area for the proposed action is approximately 534 acres.

2.3.2 SOILS AND TOPOGRAPHY

Soils within the survey boundary were mapped using the Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2008). The proposed action crosses eight different soil types (see Appendix C, Figure 4, Soils), including:

- ***Grangeville Fine Sandy Loam (Gr) –*** This nearly level soil occurs on alluvial fans and alluvial plains and is used for pasture, truck crops, tomatoes, and flowers. It is a poorly drained, very deep fine sandy loam derived from granitic alluvium. The available water holding capacity is 6 to 8.5 inches. Runoff is very slow, and the erosion hazard is slight. The elevation ranges from 50 to 200 feet.
- ***Tujunga Gravelly Loamy Sand (TvC), 0-9 percent slopes –*** This soil occurs on alluvial fans and flood plains and is used mainly for grazing. Tujunga series consists of very deep, somewhat excessively drained soils formed in alluvium weathered mostly from granitic sources. The soils formed in sandy alluvium derived mostly from granitic sources. Runoff is very low or negligible and permeability is rapid. The elevation ranges from 5 to 4,300 feet.
- ***Hanford Coarse Sandy Loam (HaC), 2-9 percent slopes –*** This soil occurs on stream bottoms, floodplains and alluvial fans and is used for growing a wide range of fruits, vegetables, and general farm crops. Hanford series consists of very deep, well drained soils that formed in moderately coarse textured alluvium dominantly from granite. Runoff is well drained or low and permeability is moderately rapid. The elevation ranges from 150 to 3,500 feet.
- ***Psamments and Fluvents, Frequently Flooded (Ps) –*** Psamment soils are sandy in all layers and are among the most productive rangeland soils. Psamments are used mostly as rangeland, pasture, or wildlife habitat. Fluvents are more the more or less freely drained entisols that have formed in recent water-deposited sediments on flood plains, fans, and deltas along rivers and small streams. Fluvents are used as rangeland, forest, pasture, or wildlife habitat and sometimes used as cropland. Most fluvents are frequently flooded with normal stratification of materials unless they are protected by dams or levees.
- ***Tujunga Loamy Sand (TvB), 0-5 percent slope –*** This soil occurs in somewhat excessively drained soils formed in alluvium and is used for growing citrus, grapes and other fruits but mainly used for grazing. Tujunga series consists of mostly weathered granitic sources. Runoff is very low to negligible with rapid permeability. The elevation ranges from 5-4,300 feet.
- ***Grangeville Fine Sandy Loam, Saline-Alkali (Gs) –*** This nearly level soil occurs on alluvial fans and alluvial plains and is used for pasture, truck crops, tomatoes, and flowers. It is a poorly drained, very deep fine sandy loam derived from granitic alluvium. The available water holding capacity is 6 to 8.5 inches. Formerly, most areas of Grangeville soils were occasionally flooded. Runoff is negligible, with moderate permeability in saline-sodic phases. The elevation ranges from 50 to 200 feet.
- ***Hanford Sandy Loam (HbA), 0-2 percent slopes –*** This soil occurs on stream bottoms, floodplains and alluvial fans and is used mostly for growing a wide range of fruits, vegetables, and general farm crops. Hanford series consists of mostly granite and other quartz bearing rocks. Runoff is well drained, negligible to low runoff, and with moderately rapid permeability. The elevation ranges from 150-3,500 feet.
- ***Ramona Sandy Loam (RmC), 2-9 percent slopes –*** This soil occurs on terraces and fans and used mostly for production of grain, irrigated citrus and deciduous fruits. Ramona series consists

of mostly granitic and related rock sources. Runoff is slow to rapid and permeability is moderately slow. The elevation ranges from 250-3,500 feet.

2.3.3 TOPOGRAPHY

The Action area is located in the southeastern margin of the San Bernardino Basin, in un-sectioned portions of Township 1 South; Range 4 West and Township 1 South at elevations above 1,000 feet above mean sea level (AMSL) (Appendix C, Figures 2a and 2b). The local topography is typical of low land valley areas with gentle slopes ranging from 1 to 3 percent. The general topography within the Action area grades towards the SAR from the cities of San Bernardino and Redlands, respectively. Topographical elevations in the general proximity of the Santa Ana River averages 1,028 feet AMSL and extend up to 1,078 feet AMSL in the vicinity of downtown San Bernardino and 1,474 feet AMSL in downtown Redlands.

2.3.4 HYDROLOGY

The Action Area is located within the Santa Ana River Watershed , which is approximately 2,800 square miles in area, originates at San Gorgonio Peak in San Bernardino County and drains southwesterly through Riverside and Orange Counties prior to emptying into the Pacific Ocean at Newport Beach. The Action Area is located within the Upper Santa Ana River Watershed, which is hydraulically disconnected from the lower watershed by San Prado Dam. The Study Area corresponds with the Santa Ana River Wash (HUC 18070203507), Mission Zanja (HUC 180702030506), and the Warm Creek (HUC 180702030508) sub-watershed units.

A total of five major offsite drainage features either cross or are located longitudinally to the rail corridor. The crossings from west to east are known as Warm Creek (Historic) [Bridge 1.1], Twin Creek [Bridge 2.2], the SAR [Bridge 3.4], Bryn Mawr Avenue [Bridge 5.78], and Mill Creek Zanja [Bridge 9.4]. Bridges 5.78 and 9.4 cross the Mission Zanja Flood Control Channel (Mission Zanja Channel), which is a major drainage channel located adjacent and to the south of the eastern segment of the rail corridor.

2.3.5 VEGETATION

Vegetation types or plant communities are assemblages of plant species that usually coexist in the same area. The classification of vegetation communities is based upon the life form of the dominant species within that community and the associated flora. Vegetation was classified using the R.F. Holland system of natural communities as described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Nomenclature follows Hickman (1993) and Roberts, et al. (2004). The Action area supports 15 distinct vegetation communities (Table 1); however, the predominant land cover was identified as being urban/developed. Two State-ranked sensitive vegetation communities occur within the Action area, southern cottonwood willow riparian forest and southern willow scrub. These communities are considered sensitive by the CDFW. The majority of the Action area is made up of paved roadways, man-made structures, adjacent lands that are unvegetated, and landscaped parcels. A vegetation communities map depicting the location of these communities is included as Appendix C, Figures 5a-5t.

Disturbed Habitat (Holland Code 11300)

Disturbed habitat (DH) is primarily used to identify areas of severe impacts to natural communities to the extent where it is no longer sustaining or functioning naturally. These areas have been previously physically disturbed, but continue to retain a soil substrate. Disturbed areas consist of predominantly non-native weedy and ruderal exotic species. This is not a natural community and generally does not provide habitat for wildlife or sensitive species. Examples of disturbed habitat include areas that have been graded, cleared areas for fuel management, staging areas, off-road vehicle trails, and abandoned home sites.

Table 1. Existing Vegetation within the Action Area

Vegetation Communities	Action Area Acreage
Disturbed Habitat	24.54
Disturbed Wetland	0.02
Eucalyptus Woodland	2.78
Flat-top Buckwheat Scrub (disturbed)	0.91
Mulefat Scrub	0.04
Non-Jurisdictional Ditch	1.31
Non-Native Grassland	61.90
Non-Vegetated Channel	29.22
Oak Woodland	9.62
Orchard and Vineyards	5.28
Southern Cottonwood Willow Riparian Forest	8.27
Southern Willow Scrub	0.64
Tamarisk Scrub	0.47
Urban/Developed	388.88
Total	**533.88**

Disturbed habitat in the Action area consists of abandoned staging areas, home sites, and parking areas, unpaved roads, and areas that have been graded, repeatedly cleared, and/or experienced repeated use that prevents natural revegetation (Appendix D, Photograph 1). Characteristic species include invasive, non-native forbs, such as prickly Russian-thistle/ tumbleweed (*Salsola tragus*), London rocket (*Sisymbrium irio*), fennel (*Foeniculum vulgare*). In addition, a limited amount of annual grasses typical of non-native grassland (42200) occur but do not dominate DH.

Disturbed Wetland (Holland Code 11200)

Disturbed Wetland (DW) is generally associated with areas of wetlands that have been disturbed in the past by clearing, grubbing, or mowing. The vegetation community has indicators of wetland species that have been disturbed and non-native species such as castor bean (*Ricinus communis*), giant reed grass (*Arundo donax*), pampas grass (*Cortaderia selloana*), and other invasive species.

Within the Action area, a small area of DW occurs along the northern portion of the streambed in Twin Creek just west of the existing railroad bridge. Vegetation is sparse and consists of young arroyo willow (*Salix lasiolepis*), mulefat (*Baccharis salicifolia*), Typha (*Typha* sp.), and water speedwell (*Veronica anagallis-aquatica*). Within the DW a significant amount of trash and debris has accumulated such as mattresses, clothing, and shopping carts (Appendix D, Photograph 2). There is evidence of vegetation maintenance (i.e., mowing) within the streambed. The DW does not connect upstream or downstream to wetland habitats.

Eucalyptus Woodland (Holland Code 11100)

Eucalyptus woodland (EW) is characterized by landscaped areas around homes or roadways. The primary indicator in EW is eucalyptus (*Eucalyptus* spp.), which is a non-native tree species from Australia. The understory is sparse and mostly dominated by leaf litter and weedy species including brome grasses.

Within the Action area, EW occurs adjacent to the SAR with individuals and smaller stands of Eucalyptus occurring throughout the Action area (Appendix D, Photograph 3).

Flat-top Buckwheat Scrub (Holland Code 37K00)

Flat-top buckwheat scrub (FBS) consists of a monoculture of successional vegetation that formally supported coastal sage scrub and chaparral in areas that experience continued disturbances. In the survey corridor this community is disturbed, however, it is dominated by flat-topped buckwheat (*Eriogonum fasciculatum*) and Wright's buckwheat (*Eriogonum wrightii)*, with the presence of other species. Other species that were present include annual brome grasses, fescue (*Vulpia* spp.), filaree (*Erodium* spp.), deerweed (*Lotus scoparius*), white sage (*Salvia apiana*), and ranchers fiddleneck (*Amsinckia menziesii* vars. *intermedia*).

Within the Action area, FBS occurs within a vacant lot located north of the railroad tracks adjacent to Warm Creek and east of D Street. This habitat is disturbed due to frequent mowing.

Mulefat Scrub (Holland Code 63310)

Mulefat scrub (MFS) is generally characterized by tall, herbaceous riparian scrub dominated by mulefat. This vegetation community is frequently flooded and absent floods this community would likely succeed to cottonwood- or sycamore-dominated riparian forest or woodlands.

Within the Action area this habitat occurs primarily within the SAR.

Non-native Grassland (Holland Code 42200)

Non-native grassland (NNG) is often associated with numerous species of wildflowers and a dense to sparse cover of annual grasses. Characteristic plant species of NNG include oat (*Avena* sp.), rip gut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), foxtail brome *(Bromus madritensis* ssp. *rubens),* four-spot clarkia *(Clarkia purpurea),* sierra shooting star (*Dodecatheon clevelandii*), and California melica (*Melica californica*).

NNG within the Action area is often disturbed and appears to have been previously irrigated and/or cultivated for agricultural purposes. Characteristics that comprise this attribute include the occurrence of previously open space between rows and these areas appear to be currently maintained.

Proposed Non-jurisdictional Ditch (no Holland Code)

Several proposed non-jurisdictional ditches (NJD) occur within the Action area. These ditches occur entirely within upland areas and are generally associated with the railroad ROW. These features are typically unvegetated, or vegetated with weedy ruderal species, and do not provide significant wildlife habitat. These features serve to drain road runoff from the ROW and are often connected through a series of culverts running parallel with the ROW.

Non-Vegetated Channel (Holland Code 64200)

Non-Vegetated Channel (NVC) consists primarily of engineered/leveed channels maintained by the SBCFCD or local municipality. The channels consist of a concrete, fine to coarse sandy or sandy cobbly substrate and are sparsely vegetated or unvegetated. Leveed banks consist of either concrete, concrete-covered cobble, or rock rip rap.

Within the SAR are small patchy areas of Riversidean Alluvial Fan Sage Scrub (Holland Code 32720), which includes scalebroom (*Lepidospartum squamatum*), broom matchweed (*Gutierrezia sarothrae*), and coastal goldenbush (*Isocoma menziesii*). These areas are considerably less than 15 percent vegetated and were therefore left out of the larger vegetation assessment.

Within the Action area, NVC occurs primarily in Warm Creek, and portions of Twin Creek (Appendix D, Photographs 2 and 5).

Oak Woodland (Holland Code 71100)

Oak woodland (OW) consists primarily of monotypic stands or various species of oak (*Quercus* sp.) with a poorly developed shrub layer, and well developed herbaceous layer generally dominated by grasses (*Bromes* spp.).

In the Action area this vegetation community consists of uniformly distributed scrub oak (*Quercus berberidifolia*) with an occasional live oak (*Quercus agrifolia*) and a disturbed understory made up of non-native grasses that appear to be maintained (Appendix D, Photograph 6). The area provides little habitat value due to the amount of disturbance and the surrounding land uses.

Orchard and Vineyards (Holland Code 18100)

Orchard and Vineyards (OV) occurs as an active orange grove located north of the ROW between California and Nevada Streets.

Southern Cottonwood Willow Riparian Forest (Holland Code 61330)

Tall, open, broad-leafed winter-deciduous riparian forests dominated by Fremont cottonwood (*Populus fremontii)* and several willow species (*Salix* spp). This habitat occurs in sub-irrigated and frequently overflowed lands along rivers and streams. The dominant species require moist, bare mineral soil for germination and establishment. The understory is generally vegetated by herbaceous and viney species such as sedges (*Carex* sp.), grape (*Vitis* sp.), and introduced wetland species.

Within the Action area, Southern cottonwood willow riparian forest (SCWRF) occurs primarily within the western portion of Mission Zanja Channel and within the SAR. SCWARF is a State-ranked S3.2 (threatened) sensitive habitat.

Southern Willow Scrub (Holland Code 63320)

Southern willow scrub (SWS) is usually made up of a dense thicket of various willow species (*Salix* spp.). This habitat occurs in loose, sandy alluvium near stream channels and is frequently flooded. The habitat is limited by the dense thicket of willows and frequent flooding which impacts the development of an understory.

Within the Action area, SWS occurs as small patches within the SAR and Twin Creek (Appendix D, Photographs 4 and 7). SWS is a State-ranked S2.1 (very threatened) sensitive habitat.

Tamarisk Scrub (Holland Code 63810)

Tamarisk scrub (TS) is made up of almost a monoculture of any of several tamarisk (*Tamarix* spp.) species. This vegetation community is often associated with major disturbances in areas where native vegetation is being supplemented by tamarisk.

Within the Action area Tamarisk Scrub occurs in primarily within the SAR and the Mission Zanja Channel.

Urban/Developed (Holland Code 12000)

Urban/Developed (UD) land is comprised of areas of intensive use with much of the land constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. Developed land is highly modified and characterized by permanent or semi-permanent structures, pavement, unvegetated areas and landscaped areas that require irrigation.

Within the survey corridor, developed areas are comprised of paved roadways, man-made structures, adjacent lands that are unvegetated, or landscapes with a variety of ornamental (typically non-native/ exotic) plants (Appendix D, Photograph 8).

3.0 DETERMINATION OF EFFECT

3.1 SPECIES EVALUATED

Species Requiring No Further Analysis

This document addresses potential effects to species that are federally listed or proposed for listing under the ESA. All federally listed species documented in the California Natural Diversity Database (CNDDB) as occurring within the USGS 7.5' Redlands Quadrangle and the surrounding eight quadrangles were evaluated for potential to occur within the project Action area. The evaluation considered each species known range and the presence of suitable habitat within the Action area based upon field observations. Although there are several federally listed and proposed species considered in this BA, only six species are analyzed in detail as a result of the proposed action. The remaining species would be unaffected by the proposed action based on their absence within the proposed Action area or a low potential for occurrence based on local habitat conditions. Appendix A includes a complete list of the botanical and wildlife species considered in the Action area. Appendix B contains the species inventory based on the California Natural Diversity Database (CNDDB).

Species Included in the Analysis

The following federally threatened, endangered, or candidate species occur, have the potential to occur, or have designated critical habitat within the proposed Action area:

- Santa Ana River wooly star (*Eriastrum densifolium ssp. sanctorum*)
- Slender-horned spineflower (*Dodecahema leptoceras*)
- Least Bell's vireo (*Vireo bellii pusillus*)
- Southwestern willow flycatcher (*Empidonax traillii extimus*)
- San Bernardino kangaroo rat (*Dipodomys merriami parvus*)
- Santa Ana sucker (*Catostomus santaaneae*)

Information regarding each species is provided in Sections 3.3 through 3.8, including a brief description of the species, current status, basic ecology, and distribution, as well as an assessment of potential effects that the proposed action may have on each species. Where adverse effects are identified, measures are presented to mitigate effects to each species.

3.2 CRITICAL HABITAT

The action addressed within this BA falls within USFWS designated critical habitat for the Santa Ana sucker and San Bernardino kangaroo rat.

The portion of the Action area within the Santa Ana River (SAR) occurs within critical habitat for the Santa Ana sucker (SAS). Specifically, the proposed action occurs within critical habitat Unit 1, Subunit 1a in an area that is not currently occupied by the species but provides transit of water and coarse materials downstream to occupied habitat. Substrate at the SAR/Bridge 3.4 is primarily sand with some coarser material (e.g., cobbles) mixed in. Sand dominates the river bed downstream to the Prado Basin. Coarse materials (gravel and cobbles) from upstream sources pass through the Action area during larger runoff events when water velocity is high enough to transport them.

The historical range of the San Bernardino kangaroo rat (SBKR) extends from the San Bernardino Valley in San Bernardino County to the Menifee Valley in Riverside County (Lidicker 1960). SBKR occur on sandy soils and sandy loam soils within relatively open vegetation, generally along rivers, streams and

drainages. San Bernardino kangaroo rat is described as being confined to primary and secondary alluvial fan scrub habitats, with sandy soils deposited by fluvial (water) rather than eolian (wind) processes. Burrows are dug in loose soil, usually near or beneath shrubs. While the general habitat preference for the species is alluvial scrub, it mainly occurs in early and intermediate seral stages of this plant community (McKernan 1997).

3.3 SANTA ANA RIVER WOOLY STAR – "MAY AFFECT AND LIKELY TO ADVERSELY AFFECT"

3.3.1 STATUS, ECOLOGY, AND DISTRIBUTION

Federal Status: Endangered

The Santa Ana River Woolly Star is a perennial herb that is native to California at elevations of 298 to 2,001 feet (91 to 610 meters) above mean sea level. This species is associated with sandy or gravelly chaparral and coastal scrub (alluvial fan). This species blooms and is best surveyed for in May through September (CNPS 2010).

3.3.2 SURVEY INFORMATION

Habitat for this federally endangered species occurs in sandy areas associated with all sandy-bottomed drainages located within the Action area (e.g., SAR, Mission Zanja Channel, etc.) Prior to the site-specific rare plant surveys, the nearest documented occurrence of this species in the CNDDB is located within approximately 1,700 feet of the Action area. One individual was observed during the 2012 springtime rare plant survey located within approximately 50 feet of Bridge 3.4 in the SAR (see Appendix C, Figure 5G). This individual was also confirmed present during the site visit with USFWS in July 2013.

3.3.3 DETERMINATION OF EFFECT

One individual Santa Ana River wooly star was observed within the Action area. Any impact to this species would result in a "may affect-likely to adversely affect" determination to this species. Potential direct and indirect impacts and the mitigation measures proposed to eliminate potential impacts under the proposed action are presented below.

3.3.4 DIRECT IMPACTS

Construction

Based on springtime rare plant surveys within the Action area, a single federally endangered Santa Ana River woolly star was observed within the vicinity of the proposed improvements for Bridge 3.4 at the SAR (see Appendix C, Figure 5G). The observed individual is located approximately 0.7 miles downstream from the closest, locally established population and, therefore, not considered part of a larger population in the Action area. The plant is located within the proposed temporary impact footprint, and construction activities associated with the installation of cofferdam (or CISS piles) carry a potential to directly impact the Santa Ana River woolly star individual.

Operations

Future operations would be restricted to the existing railroad ROW with maintenance activities required to maintain the track free of debris, including vegetation. These activities would be restricted to SANBAG's ROW and would not extend into adjacent sensitive habitats. For this reason, no direct impacts during operation are anticipated.

3.3.5 POTENTIAL INDIRECT IMPACTS

No indirect impacts to Santa Ana River wooly star are anticipated from implementation of the proposed action.

3.3.6 CONSERVATION MEASURES

Conservation Measure 1. Protection of Sensitive Plants and Habitats. SANBAG shall require the construction contractor to implement the following measures to protect sensitive plants and habitats during project-related construction.

1. SANBAG shall designate an approved biologist (project biologist) who will be responsible for overseeing compliance with protective measures for the biological resources during clearing and work activities within and adjacent to areas of native habitat. The project biologist will be familiar with the local habitats, plants, and wildlife and maintain communications with the contractor to ensure that issues relating to biological resources are appropriately and lawfully managed. The project biologist will review final plans, designate areas that need temporary fencing, and monitor construction. The biologist will monitor activities within designated areas during critical times such as vegetation removal, the installation of Best Management Practices (BMPs) and fencing to protect native species, and ensure that all avoidance and minimization measures are properly constructed and followed.
2. Project employees and contractors that will be on-site shall complete environmental worker-awareness training conducted by the project biologist. The training will advise workers of potential impacts to the sensitive habitat and listed species and the potential penalties for impacts to such habitat and species. At a minimum, the program will include the following topics: occurrences of the listed species and sensitive vegetation communities in the area, a physical description and their general ecology, sensitivity of the species to human activities, legal protection afforded these species, penalties for violations of Federal and State laws, reporting requirements and work features designed to reduce the impacts to these species; and to the extent practicable, promote continued successful occupation of areas adjacent to the work footprint. Included in this program will be color photos of the listed species, which will be shown to the employees. Following the education program, the photos will be posted in the contractor and resident engineer's office, where they will remain through the duration of the work. Photos of the habitat in which sensitive species are found will also be posted on-site. The contractor will be required to provide SANBAG with evidence of the employee training (e.g., sign in sheet or stickers) upon request. Employees and contractors will be instructed to immediately notify the project biologist of any incidents, such as construction vehicles that move outside of the work area boundary. The project biologist will be responsible for notifying the USFWS within 72 hours of any similar incident.
3. Prior to construction, SANBAG shall delineate the construction area (including staging and laydown areas) between Mile Posts 3.3 and 4.0 and erect exclusionary construction fencing along the perimeter of the identified construction area to protect adjacent sensitive habitats (SWS, SCWRF and Santa Ana woolly star). Limits of the exclusionary fencing shall be confirmed by the project biologist prior to habitat clearing. Exclusionary fencing shall be maintained throughout the duration of construction work from Mile Posts 3.3 to 4.0. Exclusionary fencing can be removed at the conclusion of construction work as approved by the project biologist.

   All construction-related vehicles and equipment storage shall occur in the construction area and/or previously disturbed areas as approved by the project biologist. Project-related vehicle traffic shall be restricted to established roads, construction areas, storage areas, and staging and parking areas.

If construction activity extends beyond the exclusionary fencing into sensitive vegetation communities, areas of disturbance shall be quantified and an appropriate restoration approach shall be developed in consultation with USFWS. For example, if construction extends beyond the limits of the exclusionary fencing, temporarily disturbed areas shall be restored to the natural (preconstruction) conditions, which may include the following: salvage and stockpiling of topsoil, re-grading of disturbed sites with salvaged topsoil, and re-vegetation with native locally available species.

Conservation Measure 2. Pre-Construction Plant Survey. Prior to construction, a qualified biologist retained by SANBAG shall conduct pre-construction surveys for special status plant species including Santa Ana River woolly star and slender-horned spineflower. If one or more species are detected, then SANBAG shall consult with the USFWS to develop additional minimization measures prior to project construction (if necessary). These additional measures may include construction timing restrictions and/or construction monitoring.

Conservation Measure 3: Seed Collection and Reseeding: Prior to construction, seed will be collected from any individuals observed during the pre-construction plant survey and stored for reseeding after project completion. Fifty percent of seed will be broadcast and imprinted at the end of the first blooming period after temporary impacts within the Santa Ana River are restored to pre-project contours. The remaining seed will be broadcast and imprinted at the end of the following blooming season. Focused surveys will be conducted during the blooming period following seeding to document germination.

3.4 SLENDER-HORNED SPINEFLOWER – "NO EFFECT"

3.4.1 STATUS, ECOLOGY, AND DISTRIBUTION

Federal Status: Endangered

The Slender-horned Spineflower is an annual herb that is native to California at elevations of 656 to 2,493 feet (200 to 760 meters) above mean sea level (Calflora 2010). This species is associated with sandy chaparral, cismontane woodland and coastal scrub (alluvial fan) (CNPS 2010). This species blooms and is best surveyed for in April through June (CNPS 2010).

3.4.2 SURVEY INFORMATION

Focused surveys for sensitive plants known to occur, or with the potential to occur in the Action area were conducted in 2012. Habitat for the federally endangered species occurs as sandy areas associated with all sandy-bottomed drainages located within the Action area (e.g., SAR, Warm Creek, Mission Zanja Channel, etc.) The species is known to occur upstream and downstream of where the SAR transects the Action area and upstream of the Action area in Warm Creek. CNDDB data indicate that there is one elemental occurrence of this species within the Action area; however, this record was in 1983. Although moderately suitable habitat occurs within the Action area, this species was not observed during focused rare plant surveys.

3.4.3 DETERMINATION OF EFFECT

Given that this species was not observed during focused rare plant surveys, impacts to the slender-horned spineflower would not occur due to implementation of the proposed action. Therefore, the proposed action will have "no effect" on slender-horned spineflower.

3.4.4 CONSERVATION MEASURES

Although this species was not observed during focused surveys, given the span of time between the previous survey and anticipated construction, SANBAG proposes the implementation of Conservation Measures 1, Protection of Sensitive Plants and Habitats, and Conservation Measure 2, Pre-Construction Plant Survey.

3.5 LEAST BELL'S VIREO – "MAY AFFECT AND LIKELY TO ADVERSELY AFFECT"

3.5.1 STATUS, ECOLOGY, AND DISTRIBUTION

Federal Status: Endangered

The least Bell's vireo historically occurred throughout California, including the coastal ranges, Central Valley, Sierra Nevada foothills, Owens Valley, Death Valley, Mojave Desert and northwestern Baja California (Matthews and Moseley 1990). In 1990, 80 percent of the U.S. population occurred along just five drainages: Santa Margarita River, Sweetwater River, San Luis Rey River, San Diego River and the SAR (Prado Basin) (Ehrlich et al. 1992).

Habitat for the LBV includes riparian, shrubland/chaparral, and woodland. LBV prefer dense brush, mesquite, willow-cottonwood forest, streamside thickets, and scrub oak in arid regions but often near water (AOU 1983). They often return to the same breeding territory in successive years and only make nests in shrubs or low trees usually averaging about 1 meter aboveground (Franzreb 1989). The loss of about 95 percent of the former U.S. range and the loss of breeding habitat due to agricultural, urban and commercial development, flood control, river channelization and cowbird parasitism have lead to a dramatic decline in population and distribution (1994 End. Sp. Tech. Bull. 19(5):12; Saul 1995, Greaves 1997) (Franzreb 1989).

The LBV usually has a clutch size of 3-5 with incubation lasting 14 days. The LBV eats almost exclusively insects, spiders, snails, fruits, and forages in dense brush and occasionally tree tops (Terres 1980, NGS 1983).

3.5.2 SURVEY INFORMATION

This species was observed within the Action area during general biological surveys conducted in June and July 2012. During focused protocol surveys several LBV were detected (see Appendix E). On April 16, 2012 a male was observed calling approximately 600 feet to the northeast of the bridge crossing along the eastern side of the river in SCWRF habitat (Appendix C, Figure 5G). This male was also observed again on April 27, 2012 and May 8, 2012. On April 27, 2012, another male was observed approximately 500 feet south of the bridge along the east bank in the riparian forest floodplain. GLA observed a pair of LBV displaying breeding behavior which was detected south of the railroad within the Mission Zanja Channel (Appendix C, Figure 5G). Several single male LBV were also detected outside of the Action area. A single male LBV (LBV 1) was observed approximately 400 feet south of the railroad crossing on June 1, 11, 25, and July 5, 2012. LBV 2 was a single male that was observed approximately 500 feet north of the bridge crossing on June 1 and June 11, 2012. LBV 3 was a male that was observed on June 11, 2012, approximately 600 feet south of the railroad crossing. LBV 3 arrived south of the project site, was observed briefly counter singing with LBV 1 and then flew back south out of the Action area.

3.5.3 DETERMINATION OF EFFECT

LBV have been observed within the Action area. Any impact to this species, including loss of habitat, would result in a "may affect-likely to adversely affect" determination to this species. Potential direct and indirect impacts and the mitigation measures proposed to eliminate potential impacts of the proposed action are presented below.

3.5.4 DIRECT IMPACTS

Construction

Four LBV territories (5 individuals; 4 males and 1 female) were mapped within the vicinity of the Action area of the SAR and the confluence of the Mission Zanja Channel with the SAR (see Appendix E). Of these, one breeding pair of LBV were observed within the Mission Zanja Channel, approximately

110 feet from the project centerline but outside of the Action area (see Appendix C, Figure 5G). In total, implementation of the proposed action will permanently impact 0.96 acres of suitable LBV habitat consisting of SCWRF. In addition, the proposed action will temporarily impact 0.74 acre of suitable LBV habitat including 0.62 acres of SCWRF and 0.12 acres of SWS. Of the 0.62 acres of SCWRF temporarily impacted by the proposed action, approximately 0.14 acres of SCWRF located south of the railroad ROW are considered occupied by a breeding pair of LBV based on focused surveys in 2012.

Operations

The long term operation of the proposed action would result in minimal physical disturbance to adjacent suitable habitat for LBV (railroad right-of-way maintenance per Federal Railroad Administration requirements). Direct impacts to LBV during operation are not anticipated.

3.5.5 POTENTIAL INDIRECT IMPACTS

Construction

Given that construction in the vicinity of the SAR and Mission Zanja Channel could occur year round, construction activities would coincide with the LBV breeding season (March 15-September 15). During construction of the proposed action, construction activities could produce noise levels that would adversely affect breeding LBV. USFWS typically applies a noise level criterion of 60 dBA Leq for assessing project-related noise effects to listed bird species. Therefore, if active LBV nests occur within the 60 dBA Leq contour generated by construction equipment, an indirect impact associated with construction-related noise could result.

Operations

During operations, the proposed action would result in minimal physical disturbance (railroad right-of-way maintenance per Federal Railroad Administration requirements) to adjacent suitable habitat and the potential for indirect impacts to LBV is considered low. Specifically, the projected post-project 60 dBA Leq noise contour does not intersect occupied habitat (Figure 6).

3.5.6 CONSERVATION MEASURES

SANBAG proposes the implementation of Conservation Measure 1, Protection of Sensitive Plants and Habitats, in conjunction with the conservation measures described below, to mitigate potential impacts to LBV.

Conservation Measure 4. Pre-Construction Wildlife Survey. Prior to construction, a qualified biologist retained by SANBAG shall conduct pre-construction surveys for special status wildlife species including least Bell's vireo, southwestern willow flycatcher, and San Bernardino kangaroo rat to verify presence or absence in the Project area. If one or more species are detected, then SANBAG shall consult with the USFWS (and/or CDFW if appropriate) to develop additional minimization measures prior to project construction (if necessary). These additional measures may include construction timing restrictions and/or construction monitoring.

Conservation Measure 5. Least Bells Vireo (LBV). The following measures will be implemented to minimize direct and indirect impacts to LBV during construction:

a. Impacts associated with clearing and grubbing of Southern Cottonwood Willow Riparian Forest (SCWRF) and Southern Willow Scrub (SWS) will be timed to avoid the breeding season of the least Bell's vireo (March 15 to September 15), unless SANBAG provides survey documentation to USFWS that confirms the riparian habitat in not occupied by LBV.

b. Temporary impact areas will be restored to pre-grade contours following bridge construction. Natural recruitment is anticipated to occur rapidly due to the large amount of intact native

riparian habitat that will remain as a seed source. Additionally, the riparian habitat being impacted is adapted to frequent disturbance. The individual species making up the community tend to have large quantities of seeds and very rapid growth that promote rapid re-establishment. Container planting and seeding has not been proposed due to potential conflicts with County Flood Control Maintenance requirements, high risk of plant material being washed out during subsequent storm events and potential conflicts with future Santa Ana River Trail construction. For erosion control purposes, temporarily impacted areas outside of the active floodplain will be hydroseeded with native grasses and shrubs.

i. The temporarily impacted SCWRF and SWS habitat will be monitored annually for five years, until LBV is documented using the re-established habitat or until habitat attains 80 percent cover including both shrub and overstory stratum. If recruitment of SCWRF and SWS species is not evident within two years of project construction or habitat has not attained 60 percent cover within three years, impacts will be treated as permanent and additional mitigation for areas not meeting success criteria shall be provided through in-lieu fee payment to an appropriate mitigation bank for enhancement, restoration or establishment of LBV habitat at a ratio of 1:1.

ii. Temporary direct impacts to potentially suitable LBV habitat will be mitigated as follows: The temporal loss of occupied LBV habitat resulting from temporary removal of SCWRF associated with the Mission Zanja Channel shall be mitigated through in-lieu fee payment to an appropriate mitigation bank for enhancement, restoration or establishment of LBV habitat at a ratio of 3:1. The temporal loss of suitable unoccupied LBV habitat resulting from temporary removal of SCWRF and SWS shall be mitigated through in-lieu fee payment to an appropriate mitigation bank for enhancement, restoration or establishment of LBV habitat at a ratio of 2:1.

c. Permanent direct impacts to occupied LBV habitat (SCWRF) shall be mitigated at a ratio of 3:1 through in-lieu fee payment to an appropriate mitigation bank for enhancement, restoration and/or creation of LBV habitat within the Santa Ana River watershed.

d. If active LBV nests are identified during pre-construction surveys and noise levels at the nest exceed 60 dBA Leq, noise attenuation structures will be placed or other noise attenuation measures (e.g., reducing the number of construction vehicles or using different types of construction vehicles) will be implemented to reduce noise levels at the nest to 60 dBA Leq (or ambient noise level if greater than 60 dBA Leq). During construction adjacent to these areas, noise monitoring shall occur during the LBV breeding season and be reported daily to USFWS. Construction activities that create noise in excess of the aforementioned levels will cease operation until effective noise attenuation measures are in place to the extent practicable.

3.6 SOUTHWESTERN WILLOW FLYCATCHER – "NOT LIKELY TO ADVERSELY AFFECT"

3.6.1 STATUS, ECOLOGY, AND DISTRIBUTION

Federal Status: Endangered

The southwestern willow flycatcher (SWFL) breeds throughout the southwestern U.S. as far east as Texas and possibly northern Baja California. SWFL typically nest in relatively dense riparian vegetation where surface water is present for part of the year, or soil moisture is high enough to maintain the appropriate vegetation characteristics. SWFL breeding habitat is restricted to relatively dense growths of trees and shrubs in riparian ecosystems and can be composed of a single species of willow (*Salix* sp.) or a mixture of native and nonnative trees and shrubs (Bent 1960). Species decline is a result of destruction and fragmentation of riparian habitat by the way of dams, reservoirs, diversions, channelization, groundwater

pumping, and mismanagement of livestock, recreational development and cowbird parasitism (USFWS 2002) (USFWS 2011).

SWFL eat mainly insects (wasps, bees, flies, beetles, spittlebugs butterflies/moths and caterpillars) caught in flight while occasionally gleaning insects from foliage and berries (Bent 1960). Breeding usually occurs from early June through the end of July with incubation of normally one brood lasting 12-15 days. The riparian scrub/forest habitat associated with the SAR and Mission Zanja Channel provides suitable breeding habitat for SWFL. Habitat ranges from around 1,460 feet in elevation.

3.6.2 SURVEY INFORMATION

Suitable habitat for this species was observed in the Action area during general biological surveys conducted in February 2012. Although suitable habitat for this species exists on site, no SWIFL were detected during the five protocol surveys within the Action area (Appendix F).

3.6.3 DETERMINATION OF EFFECT

While no SWFL were detected within the Action area, suitable habitat for this species occurs in the Action area. Any impact to this species, including loss of habitat, would result in a "may affect-likely to adversely affect" determination to this species. Potential direct and indirect impacts and the conservation measures proposed to eliminate potential impacts under the proposed action are presented below.

3.6.4 DIRECT IMPACTS

Construction

No SWFL were observed within the Action area, therefore, direct impacts to this species are not likely. However, given the presence of suitable habitat and the duration of time prior to construction (2015), it is possible that SWIFL could occur within the Action area and be impacted by construction.

Operations

Once operational, the proposed action would result in minimal physical disturbance to adjacent suitable habitat for SWFL. Direct impacts to SWFL during operation are not anticipated.

3.6.5 POTENTIAL INDIRECT IMPACTS

Construction

During construction of the proposed action, construction activities could produce noise levels that would adversely affect SWFL if they were to establish residency within the Action area prior to the start of construction. Therefore, an indirect impact associated with construction-related noise could result.

Operations

During operations, the proposed action would result in minimal physical disturbance to adjacent suitable habitat and the potential for indirect impacts to sensitive zoological or bird species is considered low. For example, the potential for noise from passing trains to adversely affect breeding birds is very remote given the limited presence of suitable breeding habitat within the urbanized rail corridor and the infrequent and transient train movements past a given point.

3.6.6 CONSERVATION MEASURES

While SWFL was not observed during focused surveys, given the span of time between the previous survey and anticipated construction, SANBAG proposes the implementation of Conservation Measure 1, Protection of Sensitive Plants and Habitats, Conservation Measure 4, Pre-Construction Wildlife Survey, and Conservation Measure 5, LBV to ensure that the project results in no potential adverse effect to the species if they became established within the Action area prior to initiation of construction.

3.7 SAN BERNARDINO KANGAROO RAT– "NOT LIKELY TO ADVERSELY AFFECT"

3.7.1 STATUS, ECOLOGY, AND DISTRIBUTION

Federal Status: Endangered

The historical range of the San Bernardino kangaroo rat (SBKR) extends from the San Bernardino Valley in San Bernardino County to the Menifee Valley in Riverside County (Lidicker 1960). SBKR occurs on sandy soils and sandy loam soils within relatively open vegetation, generally along rivers, streams and drainages. The habitat of the San Bernardino kangaroo rat is described as being confined to primary and secondary alluvial fan scrub habitats, with sandy soils deposited by fluvial (water) rather than eolian (wind) processes. Burrows are dug in loose soil, usually near or beneath shrubs. While the general habitat preference for the species is alluvial scrub, it mainly occurs in early and intermediate seral stages of this plant community (McKernan 1997).

3.7.2 SURVEY INFORMATION

The Action area is within the historical range of SBKR. The USFWS (2008) has designated parts of the SAR as critical habitat for the species. CNDDB data indicate there is one record of elemental occurrence of this species within the Action area, which occurred in 1993. The disturbed and relatively undisturbed habitat that occurs where the site intersects Warm Creek and the SAR are potential SBKR habitat. Elsewhere along the Action area, the ROW does not contain floodplain and agricultural habitats that could support SBKR, and is separated from such habitats by urban development. Robust populations of SBKR are documented approximately 1 mile upstream of the Action area. According to recent surveys conducted in the vicinity of the proposed action, SBKR have recently (2010 and 2012) been located approximately 0.25 mile upstream of the SAR crossing.

The trapping results show that SBKR do not currently occupy habitat within the Action area (Appendix G). No SBKR were trapped over the course of the 5-night trapping survey.

3.7.3 DETERMINATION EFFECT

While no SBKR were detected within the Action area, the Action area is within the historical range of SBKR. Any impact to this species, including loss of habitat, would result in a "may affect-likely to adversely affect" determination to this species. Potential direct and indirect impacts and the conservation measures proposed to eliminate potential impacts under the proposed action are presented below.

3.7.4 DIRECT IMPACTS

Construction

Based on the completion of focused surveys for SBKR, no evidence of their presence was documented in the Action area (see Appendix G). However, the Action area at the SAR overlaps with Unit 1 of designated SBKR critical habitat. Temporary impacts to 1.68 acres and permanent impacts to 0.85 acres of the 8,935 acres of the total designated SBKR critical habitat within Unit 1 would not result in an adverse modification to critical habitat as designated within this Unit 1. Furthermore, the proposed action will not change the hydrologic processes in any way that will contribute to further loss of primary constituent elements (PCEs) identified for SBKR within the SAR. However, given the duration of time prior to construction (2015) and the presence of marginally suitable habitat, it is possible that SBKR could take residence within the Action area and be impacted by construction.

Operations

Once operational, the proposed action would not require additional direct impacts to the SAR, which is considered critical habitat for SBKR. Furthermore, the proposed action will not change the hydrologic

processes within the Action area that could contribute to further loss of PCEs identified for SBKR within the SAR. For these reasons, no long term operational direct impacts are anticipated.

3.7.5 POTENTIAL INDIRECT IMPACTS

Construction

Indirect impacts would generally be attributed to temporary construction-related dust and water quality effects. For example, hazardous materials leaks, such as fuel, hydraulic fluid, and/or lubricants, from equipment working in or above the river channel, although unlikely, have a potential to contaminate dry or moist river bed sediments when no flow is present. This contamination, if not cleaned up immediately, could remain within the Action area or be transported downstream during higher flow events to critical habitat occupied by SBKR. Degradation of existing critical habitat functions and values would be considered an indirect impact. However, implementation of project design features and BMPs identified in the SWPPP and National Pollutant Discharge Elimination System (NPDES) permit prepared for the proposed action would reduce impacts to water quality during construction.

Operations

During operations, the proposed action would result in minimal physical disturbance to adjacent suitable habitat and the potential for indirect impacts to SBKR is considered low.

3.7.6 CONSERVATION MEASURES

While SBKR was not observed during focused surveys, given the span of time between the previous survey and anticipated construction, SANBAG proposes the implementation of Conservation Measure 1, Protection of Sensitive Plants and Habitats, and Conservation Measure 4, Pre-Construction Wildlife Survey in addition to the conservation measures proposed below to ensure that the project results in no potential adverse effect to the species if they became established within the Action area prior to initiation of construction.

Conservation Measure 6. Prepare and Implement a SWPPP. The construction contractor will develop a SWPPP that complies with the requirements of the NPDES General Construction Permit (Order 2009-0009-DWQ as amended by Order No. 2010-0014-DWQ and 2012-0006-DWQ) and implement the BMPs described in the SWPPP. The SWPPP shall identify specific actions and BMPs relating to the prevention of stormwater pollution from project-related construction sources by identifying a practical sequence for site restoration, BMP implementation, contingency measures, responsible parties, and agency contacts. The SWPPP shall reflect localized surface hydrological conditions and shall be reviewed and approved by SANBAG prior to commencement of work and shall be made conditions of the contract with the contractor.

The SWPPP shall be prepared by a qualified SWPPP developer with BMPs selected to achieve maximum pollutant removal and that represent the best available technology that is economically achievable. Emphasis for BMPs shall be placed on controlling discharges of oxygen-depleting substances, floating material, oil and grease, acidic or caustic substances or compounds, and turbidity. BMPs for soil stabilization and erosion control practices and sediment control practices will also be required. Performance and effectiveness of these BMPs shall be determined either by visual means where applicable (i.e., observation of above-normal sediment release), or by actual water sampling in cases where verification of contaminant reduction or elimination, (inadvertent petroleum release) is required to determine adequacy of the measure.

3.8 SANTA ANA SUCKER – "NOT LIKELY TO ADVERSELY AFFECT"

3.8.1 STATUS, ECOLOGY, AND DISTRIBUTION

Federal Status: Endangered

The Santa Ana sucker (SAS) is a small fish that occurs in the rivers, larger streams and tributaries in southern California and it is believed that the species' historical occupancy varied depending on suitability and access to these different areas (USFWS 2000, p. 19686). Santa Ana sucker generally inhabits perennial streams that have water depths ranging from a few inches to several feet and water currents from slight to swift (Smith 1966, p. 57).

The SAS's population has declined due to habitat availability/modification as a result of surrounding urban encroachment. Modifications to the watershed such as diversions, dams and recharge basins along with the volume and flow rate of water are key factors that shape the watershed and impact the SAS population (Appendix H). The SAS has lost approximately 70 percent of its historic range in the SAR watershed and 75 percent of its historic range (USFWS 2000, pp. 19687-19688).

3.8.2 SURVEY INFORMATION

The proposed action is located near the upstream edge of Critical Habitat Unit 1 (SAR), Subunit 1B, in an area that is not currently occupied by SAS due to an existing barrier to upstream movement at La Cadena Drive. This area is not currently occupied by the species but provides transit of water and coarse materials downstream to occupied habitat. Downstream distance to occupied habitat from the SAR (Bridge 3.4) is approximately 2.25 miles. Based on these circumstances, no SAS are expected to occur within the Action area or the Action area (Appendix H).

3.8.3 DETERMINATION OF EFFECT

While no SAS are expected to occur within the Action area, a portion of the Action area within the SAR occurs within critical habitat for the SAS. Any impact to this species, including loss of habitat, would result in a "may affect-likely to adversely affect" determination to this species. Potential direct and indirect impacts and the conservation measures proposed to eliminate potential impacts under the proposed action are presented below.

3.8.4 DIRECT IMPACTS

Construction

Due to a number of barriers that occur downstream of the proposed Action area there is no risk of direct take of individual SAS in conjunction with implementing the proposed action (Appendix H). Although the proposed action will not likely result in the loss of a federally listed species, it would temporarily affect critical habitat through construction-related disruption of the channel bed and banks. This would include the temporary placement of both the proposed bridge supports along side of the existing bridge supports. However, these effects would be temporary and are not expected to result in direct take of SAS.

Operations

Based on hydraulic modeling, the proposed bridge piles (i.e., supports) at Bridge 3.4 (SAR) are not anticipated to substantially alter sediment and water transport downstream (Appendix I). Each bridge pile would be the same width as the existing piles but approximately 20 feet longer and oriented parallel to river flows. The river channel under the new bridge would be widened (approximately 70 feet), particularly on the north side. The new bridge requires five new piles that would occur in the widened portion of the SAR. Hydraulic modeling determined the new bridge would result in a slightly lower water surface elevation and velocity during a 100-year flow event (Appendix I) as compared to the existing structure. Therefore, the new bridge piles would not impede water transport under the new bridge nor

would it change water surface elevations downstream of the bridge. Based on these considerations, the proposed design for both the Preferred Project and Reduced Project Footprint would not adversely affect water or sediment transport downstream. For these reasons, no long term operational direct impacts are anticipated.

3.8.5 POTENTIAL INDIRECT IMPACTS

Construction

Indirect impacts would generally be attributed to temporary construction-related water quality effects. For example, hazardous materials leaks, such as fuel, hydraulic fluid, and/or lubricants, from equipment working in or above the river channel, although unlikely, have a potential to contaminate dry or moist river bed sediments when no flow is present. This contamination, if not cleaned up immediately, could be transported downstream during higher flow events to critical habitat occupied by SAS. Degradation of existing critical habitat functions and values would be considered an indirect impact. However, implementation of project design features and BMPs identified in the SWPPP and NPDES construction permit prepared for the proposed action would reduce impacts to water quality during construction.

Construction of the new Bridge 3.4 would result in disturbances within the river channel and on the banks related to access, installation of temporary cofferdam(s) or CISS piles (or similar bridge structure type), dredging in the river bed and/or excavation along the banks, and removal of the cofferdam(s) or CISS piles (or similar bridge structure type) when construction is completed. Dredging and/or excavation of the river banks under the bridge to widen the channel would have the potential to cause suspension of fine sediments if the work occurs in flowing water or the disturbed soils later are exposed to flowing water before those soils are stabilize.

Installation and removal of temporary cofferdam(s), CISS piles (or similar bridge structure type), and bridge support structures may result in temporary indirect impacts to downstream SAS critical habitat. However, erosion and sedimentation into suitable habitat would be minimized through implementation of the SWPPP, such that temporary indirect impacts would be minimized. With the implementation of a flow diversion plan during the course of construction, existing river flows would be allowed to pass through the construction site, including coarser bed materials (e.g., cobbles).

Operations

During operations, the proposed action would result in minimal physical disturbance to adjacent suitable habitat and the potential for indirect impacts to SAS is considered low.

3.8.6 CONSERVATION MEASURES

SANBAG proposes the implementation of Conservation Measure 6. Prepare and Implement a SWPPP in conjunction with the conservation measures proposed below.

Conservation Measure 7. Prepare and Implement a Flow Diversion Plan For Construction. SANBAG or SANBAG's construction contractor shall develop a Flow Diversion Plan(s) for in-channel construction activities proposed within Warm Creek (Historic)(Bridge 1.1); Twin Creek (Bridge 2.2), SAR (Bridge 3.4), Zanja Channel (Bridges 3.9, and 5.8, and bank improvements), and Mill Creek Zanja (Bridge 9.4). SANBAG's contractor shall incorporate measures to minimize changes to flood flow elevation(s) during construction, address accumulation of floating debris, provide measures that minimize sedimentation to surface waters, and include contingency measures in the event of substantial rainfall. The diversion plan specific to Bridge 3.4 would also address the need for the continued passage of flow and coarser sediments (e.g., <2 inches in diameter) over the duration of in-channel construction.

3.9 CUMULATIVE IMPACTS

Numerous other projects, independent of the RPRP, would occur within an approximately five mile radius of the Action area. The projects range from road improvements to flood control facility improvements. The effects associated with the proposed action could combine with other projects adjacent to and outside the Action area. For this reason, the cumulative analysis considers a broader geographic context for biological resources (e.g., Reach 3 of the Santa Ana River).

From a cumulative perspective, a majority of the projects considered would occur entirely within upland urban areas and would not result in impacts to biological resources. Rather, there are six main projects in the vicinity of or adjacent to the Action area that are anticipated to potentially contribute to biological resource impacts based on their location: (1) Long-Term Maintenance of Flood Control and Transportation Facilities throughout San Bernardino County; (2) Mountain View Avenue Bridge over the SAR; (3) SAR Trail and Mission Zanja Channel Bridge; (4) Upper SAR Wash HCP; (5) I-10 HOV; and (6) Mountain View Avenue Bridge at Mission Zanja Channel. Similar to the proposed action, these projects could result in direct and indirect impacts to suitable habitat or take of one or more federally-listed species, fill of wetlands and non-wetland waters of the U. S., and/or other indirect impacts (e.g. sedimentation).

Sensitive Botanical Species

Implementation of the proposed action would result in an impact to one individual of the federally endangered Santa Ana River woolly star located south of the existing Bridge 3.4 located in the SAR. This individual is the only sensitive plant observed within the Action area and is not part of a larger population. The nearest population of Santa Ana River woolly star is located approximately 0.7 miles upstream of the Action area in the SAR. Although the direct effect to the individual Santa Ana River woolly star may be unavoidable, it would not be considered a cumulative adverse effect to the species' population as a whole with the application of the proposed conservation measures. While other cumulative projects could result in similar impacts by affecting populations within or outside the Action area, compliance with the proposed conservation measures would minimize the potential for the proposed action to result in a cumulatively adverse effect to Santa Ana River wooly star.

Sensitive Zoological Species

Implementation of the proposed action would result in direct effects to SWS and SCWRF, which are habitats that support the federally endangered LBV and other sensitive avian species. Degradation of wildlife habitat caused by the proposed action, when combined with other habitat effects occurring from other proposed transportation projects (e.g., Mountain View Avenue SAR Bridge and I-10 HOV Bridge), the SAR Trail, and SBCFCD maintenance activities, could result in cumulatively adverse effects. The effects of the proposed action would be minimized through the proposed conservation measures for each of the listed species considered in this BA (e.g., pre-construction surveys, wildlife fencing, presence of an environmental monitor, etc.). Similar to the proposed action, other cumulative projects considered would also be subject to these regulatory requirements (e.g., Sections 7 and 10 of the ESA). Based on these considerations, the incremental effect of the proposed action would not be cumulatively adverse.

4.0 HABITAT MANAGEMENT PLAN

As part of the RPRP, SANBAG will implement the habitat management plan described in this section to compensate for effects to LBV and supporting habitats resulting from implementation of the RPRP. Table 2 outlines on- and off-site habitat improvement activities proposed to compensate for the action-related impacts. Consistent with current USFWS's mitigation policy (501 FW 2) and USACE's Mitigation Rule, SANBAG proposes to purchase in-lieu fee credits for off-site mitigation to compensate for temporal and permanent impacts to LBV habitat. The basis for selecting in-lieu fee (ILF) credits to support off-site mitigation is centered on two primary issues: (1) SANBAG's need to maintain its ROW free of vegetation and related obstructions; and (2) the fact that adjacent lands impacted by construction are subject to SBCFCD ownership and regular and planned maintenance. ILF credits would be purchased from an approved ILF program prior to the start of construction, which is scheduled for 2015. Evidence of payment would be provided to USFWS.

Table 2. Habitat Impacts Related to the Redlands Passenger Rail Project

Habitat	Temporary Impacts		Permanent Impacts		Combined
	Total (Acres)[1]	Proposed Compensatory Mitigation (Acres)[2, 3]	Total (Acres)[1]	Proposed Compensatory Mitigation (Acres)[2, 4]	Proposed Compensatory Mitigation (Acres)[2]
Southern Cottonwood Willow Riparian Forest	0.62	0.74[5]	0.96	0.96	1.70
Southern Willow Scrub	0.12	0.12	--	0.00	0.12
Total	**0.74**	**0.86**	**0.96**	**0.96**	**1.82**

[1] Total habitat includes Twin Creek, Santa Ana River, and Mission Zanja Channel.
[2] Through in-lieu fee payment to approved mitigation bank for restoration for creation and/or enhancement of LBV habitat within the Santa Ana River watershed.
[3] Temporary impacts are mitigated at a ratio of 1:1 to account for temporal changes in habitat conditions following construction and prior to natural revegetation.
[4] Permanent impacts are mitigated at a ratio of 1:1 due to the poor suitability of the SCWRF habitat within SANBAG's right-of-way.
[5] 0.12 acres of temporary impacts are considered occupied and mitigated at a ratio of 2:1 per Conservation Measure 5.

All temporarily disturbed areas will be re-contoured to pre-project conditions. Temporarily impacted areas outside of the active floodplain will be hydroseeded with native grasses and shrubs for long-term erosion control. Riparian areas within the active floodplain and adjacent terraces will revegetate through natural processes. Natural recruitment is anticipated to occur rapidly due to the large amount of intact native riparian habitat that will remain as a seed source. Additionally, the riparian habitat being impacted is adapted to frequent disturbance. The individual species making up the community tend to have large quantities of seeds and very rapid growth that promote rapid reestablishment. Container planting and seeding has not been proposed due to potential conflicts with County Flood Control Maintenance requirements and high risk of plant material being washed out during subsequent storm events. Biotechnical bank stabilization methods such as straw wattles and biodegradable erosion control mats may also be implemented as needed and where appropriate. To avoid possible entrapment of small animals, including listed species, plastic monofilament netting will not be used. As noted above, the temporary impact areas will be monitored annually for five years, until least Bell's vireo is documented using the re-established habitat or until habitat attains 80 percent cover including both shrub and overstory stratum. If recruitment of SCWRF and SWS species is not evident within two years of project construction or habitat has not attained 60 percent cover within three years, impacts will be treated as permanent and additional mitigation for areas not meeting success criteria shall be provided.

In general, most construction activities would take place from September 16 through March 14 after the breeding season for LBV. Some activities may begin as early as July 15 if required permits are issued and preconstruction surveys confirm that the work would not adversely affect nesting birds. No long-term management of the restored areas outside of SANBAG's ROW is proposed as these areas would be subject to long-term maintenance activities routinely implemented by SBCFCD.

5.0 FINDINGS

The proposed action would not result in adverse modification of critical habitat for any federally listed species. Adverse modification is defined in ESA implementing regulations (50 CFR 404.02) as a direct or indirect alteration that appreciably diminishes the value of the critical habitat for both the survival and recovery of the species. Although critical habitat for the SBKR and SAS could be affected, the conservation value of SBKR Critical Habitat Unit 1 and SAS Critical Habitat will not be affected. Focused surveys did not detect SBKR within the Action area and SAS is not anticipated to occur within the Action area due to the lack of suitable habitat. Therefore, the proposed action is not likely to affect SBKR or SAS.

As described in this BA, suitable habitat for the federally endangered LBV and federally endangered SWFL also occurs within the Action area in the vicinity of the Santa Ana River. Focused surveys did not detect SWFL within the Action area, therefore the proposed action is not likely to affect the species. Focused surveys identified four LBV territories, including at least one nesting pair, in the vicinity of the proposed action. Based on the proximity of the nesting pair, the proposed action may affect, and is likely to adversely affect the LBV. Additionally, a single federally endangered Santa Ana River woolly star was observed within the proposed Action area and, as described in this BA, the proposed action may affect, and is likely to adversely affect, an individual Santa Ana River woolly star.

As described in this BA, conservation measures have been incorporated into the proposed action that would avoid and minimize adverse effects to these species. These measures will be supported by the proposed mitigation plan and habitat management plan, which will compensate for direct and indirect impacts to suitable habitat. Therefore, the proposed action would not appreciably reduce the reproduction, numbers, or distribution of any federally listed species.

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APPENDIX A

Potential Sensitive Botanical and Zoological Species

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APPENDIX A

Potential Sensitive Botanical Species

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Brassicaceae			
Gambel's water cress *Nasturtium gambelii*	Federally Endangered	Perennial herb. Occurs in marshes, streambanks, and lake margins below 4,800 feet in elevation	Low– project area supports potentially suitable habitat, however, there is a low occurrence of ponded or marshy areas within the project area. CNDDB data identifies the survey areas as within the species' occurrence territory. However, only three known populations occur in the state. The most recent record of an elemental occurrence in the survey area was 1935. The species was not observed within the Action area during 2012 rare plant surveys.
Caryophyllaceae			
Marsh sandwort *Arenaria paludicola*	Federally Endangered	Perennial herb. Occurs in boggy marshes and meadows below 1,200 feet in elevation	None – project area does not support suitable habitat. CNDDB data identifies the Action area within the species' occurrence territory. However the most recent record of an elemental occurrence in the Action area was 1899.
Chenopodiaceae			
San Jacinto Valley crownscale *Atriplex coronate* var. *notatior*	Federally Endangered	Annual herb. Occurs in vernal-pools and playas below 1650 feet in elevation.	None – project area does not support suitable habitat. The species was not observed within the Action area during 2012 rare plant surveys.
Malvaceae			
Bird-foot checkerbloom *Sidalcea pedata*	Federally Endangered	Perennial herb. Occurs in meadows and seeps below 8200 feet in elevation.	None – project area does not support suitable habitat. The species was not observed within the Action area during 2012 rare plant surveys.
Orobanchaceae			
Ash-gray paintbrush *Castilleja cinerea*	Federally Threatened	Perennial herb (hemiparasitic). Occurs in pinyon and juniper woodland, montane coniferous forest, meadows and seeps and mojavean desert scrub. From below 9710 feet in elevation.	None – project area does not support suitable habitat. The species was not observed within the Action area during 2012 rare plant surveys.

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Polygonaceae			
Santa Ana River woolly star *Eriastrum densifolium* ssp. *sanctorum*	Federally Endangered	Occurs in sandy or gravelly chaparral and coastal scrub (alluvial fan).	High – An individual plant was observed within a portion of the Action area located within the SAR during 2012 rare plant surveys.
Slender-horned spineflower *Dodecahema leptoceras*	Federally Endangered	Annual herb. Occurs in alluvial sand and coastal scrub. From 700 to 2,700 feet in elevation.	Moderate – project area supports potentially suitable habitat. CNDDB data identifies the Action area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Action Area was 1983. The species was not observed within the Action area during 2012 rare plant surveys.
Scrophulariaceae			
salt marsh bird's-beak *Cordylanthus maritimus ssp. maritimus*	Federally Endangered	Annual herb (hemiparasitic). Occurs in coastal salt-marsh, dunes, and wetlands. From below 38 feet in elevation.	None – project area does not support suitable habitat CNDDB data identifies the Action area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Action Area was 1888.
Themidaceae			
Thread-leaved brodiaea *Brodiaea filifolia*	Federally Threatened	Perennial bulbiferous herb. Occurs in coastal scrub and chaparral openings, vernal pools, playas, valley and foothill grassland. From below 3675 feet in elevation.	None – project area does not support suitable habitat. The species was not observed within the Action area during 2012 rare plant surveys.

Potential Sensitive Zoological Species

Species	Sensitivity Status	Preferred Habitat	Observed On-Site	Potential for Occurrence
Amphibians				
California Red-legged Frog *Rana draytonii*	Federally Threatened	Occurs in shallow permanent waters of streams, marshes, ponds and lakes. Estivate in or near riparian areas.	No	Low – no suitable breeding habitat within Action area

Species	Sensitivity Status	Preferred Habitat	Observed On-Site	Potential for Occurrence
Invertebrates				
Delhi Sands flower-loving fly *Rhaphiomidas terminatus abdominalis*	Federally Endangered	Fine, sandy soils, often with wholly or partly consolidated dunes. Restricted to a particular soil type classified as the 'Delhi' series.	No	None- The project site lacks appropriate soils. CNDDB data identifies the Action area as within the species' occurrence territory.
Fish				
Santa Ana Sucker *Catostomus santaanae*	Federally Threatened	Slight to swift flowing perennial streams with water depths ranging from a few inches to several feet.	No	None – Action area does not support perennial flows, however Action area occurs within Critical Habitat as a source for sediment for downstream populations of SAS
Birds				
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	Federal candidate for listing,	Deciduous riparian woodland, especially including dense stands of cottonwood and willow, but also including mesquite and tamarisk in some areas.	No	Moderate – The riparian forest habitat associated with the SAR and Mission Zanja Channel provides suitable breeding habitat. CNDDB data identifies the Action area as within the species' occurrence territory along Twin Creek and the SAR. The species was not observed during 2012 southwestern willow flycatcher and least Bell's vireo protocol surveys.
Southwestern willow flycatcher (*Empidonax traillii extimus*)	Federally Endangered	Dense riparian habitat along streams, rivers, lakesides, and other wetland habitats.	No	Moderate – The riparian forest habitat associated with the SAR and Mission Zanja Channel provides suitable breeding habitat. The species was not observed during 2012 southwestern willow flycatcher and least Bell's vireo protocol surveys.
Least Bell's vireo *Vireo bellii pusillus*	Federally Endangered	Dense brush and mesquite associated with riparian systems, willow-cottonwood forest, and streamside thickets.	Yes	High– several individuals were observed within the Action area.

Species	Sensitivity Status	Preferred Habitat	Observed On-Site	Potential for Occurrence
Mammals				
San Bernardino kangaroo rat *Dipodomys merriami parvus*	Federally Endangered	Alluvial sage scrub on alluvial fans, flood plains, along washes, and in adjacent upland areas.	No	Moderate –Suitable habitat occurs within the project area. CNDDB data identifies the Action area as within the species' occurrence territory. The most recent record of an elemental occurrence in the Action Area was 1993.
Stephens' kangaroo rat *Dipodomys stephensi*	Federally Endangered	Primarily annual and perennial grasslands, but also occurs in coastal scrub and sagebrush with sparse canopy cover.	No	None –Suitable habitat occurs within the project area but the project is not within the range of the species.

APPENDIX B

CNDDB Results

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Accipiter cooperii Cooper's hawk	G5 S3	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	790 1,680	102 S:3	0	1	1	0	0	1	0	3	3	0	0
Agelaius tricolor tricolored blackbird	G2G3 S2	None None	ABC_WLBCC-Watch List of Birds of Conservation Concern BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered USFWS_BCC-Birds of Conservation Concern	1,100 1,960	429 S:4	1	0	0	0	0	3	2	2	4	0	0
Aimophila ruficeps canescens southern California rufous-crowned sparrow	G5T3 S2S3	None None	CDFW_WL-Watch List	2,120 2,261	185 S:5	0	3	1	0	0	1	0	5	5	0	0
Ambrosia monogyra singlewhorl burrobrush	G5 S2.2	None None	Rare Plant Rank - 2B.2	1,400 1,400	16 S:1	0	0	0	0	0	1	1	0	1	0	0
Anniella pulchra pulchra silvery legless lizard	G3G4T3T4Q S3	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	1,515 2,110	91 S:4	0	1	0	2	0	1	1	3	4	0	0
Antrozous pallidus pallid bat	G5 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	1,360 1,360	402 S:1	0	0	0	0	0	1	1	0	1	0	0
Aquila chrysaetos golden eagle	G5 S3	None None	BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected CDFW_WL-Watch List IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	2,300 2,300	307 S:1	0	0	0	0	0	1	1	0	1	0	0
Arenaria paludicola marsh sandwort	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1	1,000 1,000	15 S:1	0	0	0	0	1	0	1	0	0	0	1

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Artemisiospiza belli belli Bell's sage sparrow	G5T2T4 S2?	None None	ABC_WLBCC-Watch List of Birds of Conservation Concern CDFW_WL-Watch List USFWS_BCC-Birds of Conservation Concern	2,120 2,120	57 S:1	0	0	0	0	0	1	0	1	1	0	0
Aspidoscelis hyperythra orangethroat whiptail	G5 S2	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	900 2,200	346 S:19	0	0	2	2	0	15	17	2	18	1	0
Aspidoscelis tigris stejnegeri coastal whiptail	G5T3T4 S2S3	None None		1,060 2,418	112 S:5	0	1	2	0	0	2	1	4	5	0	0
Astragalus hornii var. hornii Horn's milk-vetch	G4G5T2T3 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	1,000 1,000	14 S:1	0	0	0	0	1	0	1	0	0	0	1
Athene cunicularia burrowing owl	G4 S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,090 1,700	1844 S:13	0	3	0	0	1	9	4	9	12	0	1
Atriplex coronata var. notatior San Jacinto Valley crownscale	G4T1 S1	Endangered None	Rare Plant Rank - 1B.1	1,420 1,425	16 S:3	1	2	0	0	0	0	2	1	3	0	0
Atriplex serenana var. davidsonii Davidson's saltscale	G5T2? S2?	None None	Rare Plant Rank - 1B.2	1,430 1,430	28 S:1	0	0	0	0	0	1	0	1	1	0	0
Batrachoseps gabrieli San Gabriel slender salamander	G2 S2	None None	IUCN_DD-Data Deficient USFS_S-Sensitive	3,200 3,200	8 S:1	0	0	0	0	0	1	0	1	1	0	0
Berberis nevinii Nevin's barberry	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1	1,020 5,200	34 S:5	0	0	1	1	1	2	3	2	4	0	1
Brodiaea filifolia thread-leaved brodiaea	G1 S1	Threatened Endangered	Rare Plant Rank - 1B.1	1,900 1,900	114 S:2	0	0	1	0	0	1	1	1	2	0	0
Buteo regalis ferruginous hawk	G4 S3S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,936 1,936	96 S:1	0	0	1	0	0	0	0	1	1	0	0

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California macrophylla round-leaved filaree	G2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive		155 S:1	0	0	0	0	0	1	1	0	1	0	0
Calochortus palmeri var. palmeri Palmer's mariposa-lily	G2T2 S2.1	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	6,000 6,450	83 S:3	0	0	0	0	0	3	1	2	3	0	0
Calochortus plummerae Plummer's mariposa-lily	G4 S4	None None	Rare Plant Rank - 4.2	1,200 5,000	230 S:24	0	5	0	0	1	18	7	17	23	1	0
Canyon Live Oak Ravine Forest Canyon Live Oak Ravine Forest	G3 S3.3	None None		3,400 3,400	50 S:1	0	0	0	0	0	1	1	0	1	0	0
Carex comosa bristly sedge	G5 S2	None None	Rare Plant Rank - 2B.1	1,000 1,000	29 S:1	0	0	0	0	1	0	1	0	0	1	0
Carolella busckana Busck's gallmoth	G1G3 SH	None None		1,160 1,160	4 S:1	0	0	0	0	1	0	1	0	0	0	1
Castilleja cinerea ash-gray paintbrush	G2 S2	Threatened None	Rare Plant Rank - 1B.2	6,800 6,800	49 S:1	1	0	0	0	0	0	0	1	1	0	0
Castilleja lasiorhyncha San Bernardino Mountains owl's-clover	G2 S2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	6,000 7,300	46 S:7	0	2	0	1	0	4	3	4	7	0	0
Catostomus santaanae Santa Ana sucker	G1 S1	Threatened None	AFS_TH-Threatened CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	838 2,600	27 S:3	0	1	1	0	0	1	1	2	3	0	0
Centromadia pungens ssp. laevis smooth tarplant	G3G4T2 S2	None None	Rare Plant Rank - 1B.1	1,000 2,100	104 S:13	0	1	2	1	1	8	5	8	12	1	0
Ceratochrysis longimala Desert cuckoo wasp	G1 S1	None None		900 900	2 S:1	0	0	0	0	1	0	1	0	0	1	0
Chaetodipus fallax fallax northwestern San Diego pocket mouse	G5T3 S2S3	None None	CDFW_SSC-Species of Special Concern	1,150 2,200	94 S:22	0	7	5	4	0	6	3	19	22	0	0
Charina trivirgata rosy boa	G4G5 S3S4	None None	IUCN_LC-Least Concern USFS_S-Sensitive	1,767 2,700	48 S:3	0	2	0	0	0	1	0	3	3	0	0
Charina umbratica southern rubber boa	G2G3 S2S3	None Threatened	USFS_S-Sensitive	5,400 7,240	45 S:23	0	1	0	0	0	22	22	1	23	0	0

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Chloropyron maritimum ssp. maritimum salt marsh bird's-beak	G4?T1 S1	Endangered Endangered	Rare Plant Rank - 1B.2	1,000 1,000	27 S:1	0	0	0	0	1	0	1	0	0	1	0
Chorizanthe parryi var. parryi Parry's spineflower	G2T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive USFS_S-Sensitive	1,000 3,280	94 S:24	1	1	2	0	1	19	15	9	23	1	0
Chorizanthe xanti var. leucotheca white-bracted spineflower	G4T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	2,300 2,300	48 S:1	0	0	0	0	0	1	0	1	1	0	0
Coccyzus americanus occidentalis western yellow-billed cuckoo	G5T3Q S1	Candidate Endangered	BLM_S-Sensitive USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	1,000 1,690	119 S:2	0	1	0	0	1	0	1	1	1	1	0
Crotalus ruber red-diamond rattlesnake	G4 S2?	None None	CDFW_SSC-Species of Special Concern	900 2,280	148 S:6	0	0	0	0	0	6	6	0	6	0	0
Cuscuta obtusiflora var. glandulosa Peruvian dodder	G5T4T5 SH	None None	Rare Plant Rank - 2B.2		6 S:1	0	0	0	0	1	0	1	0	0	0	1
Dendroica petechia brewsteri yellow warbler	G5T3? S2	None None	CDFW_SSC-Species of Special Concern USFWS_BCC-Birds of Conservation Concern	1,460 1,460	48 S:1	0	0	0	0	0	1	0	1	1	0	0
Diadophis punctatus modestus San Bernardino ringneck snake	G5T2T3Q S2?	None None	USFS_S-Sensitive	3,137 4,797	10 S:3	1	2	0	0	0	0	0	3	3	0	0
Dipodomys merriami parvus San Bernardino kangaroo rat	G5T1 S1	Endangered None	CDFW_SSC-Species of Special Concern	1,030 2,200	47 S:24	3	2	6	2	1	10	5	19	23	1	0
Dipodomys stephensi Stephens' kangaroo rat	G2 S2	Endangered Threatened	IUCN_EN-Endangered	1 2,500	214 S:33	1	6	11	8	4	3	24	9	29	1	3
Dodecahema leptoceras slender-horned spineflower	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1	1,100 2,200	35 S:9	0	1	1	0	3	4	8	1	6	1	2
Elanus leucurus white-tailed kite	G5 S3	None None	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern	2,760 2,760	158 S:1	0	0	1	0	0	0	0	1	1	0	0
Empidonax traillii extimus southwestern willow flycatcher	G5T1T2 S1	Endangered Endangered	ABC_WLBCC-Watch List of Birds of Conservation Concern	790 3,400	70 S:5	1	1	1	0	0	2	0	5	5	0	0

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Eremophila alpestris actia California horned lark	G5T3Q S3	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	1,100 2,430	77 S:4	0	0	1	2	0	1	1	3	4	0	0
Eriastrum densifolium ssp. sanctorum Santa Ana River woollystar	G4T1 S1	Endangered Endangered	Rare Plant Rank - 1B.1	840 2,300	22 S:17	0	3	7	4	1	2	4	13	16	1	0
Euchloe hyantis andrewsi Andrew's marble butterfly	G3G4T1 S1	None None		4,800 6,000	6 S:4	0	0	0	0	0	4	4	0	4	0	0
Eumops perotis californicus western mastiff bat	G5T4 S3?	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern WBWG_H-High Priority	1,380 2,470	293 S:6	0	0	0	1	0	5	6	0	6	0	0
Fimbristylis thermalis hot springs fimbristylis	G4 S2.2	None None	Rare Plant Rank - 2B.2	1,900 1,900	14 S:1	0	0	0	1	0	0	0	1	1	0	0
Galium californicum ssp. primum Alvin Meadow bedstraw	G5T1Q S1	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	1,180 1,180	4 S:1	0	0	0	0	0	1	1	0	1	0	0
Gila orcuttii arroyo chub	G2 S2	None None	AFS_VU-Vulnerable CDFW_SSC-Species of Special Concern USFS_S-Sensitive	838 880	49 S:2	0	0	1	1	0	0	0	2	2	0	0
Glaucomys sabrinus californicus San Bernardino flying squirrel	G5T2T3 S2S3	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	4,600 5,300	11 S:5	1	0	2	0	0	2	3	2	5	0	0
Haliaeetus leucocephalus bald eagle	G5 S2	Delisted Endangered	BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	5,150 5,200	315 S:3	0	0	1	0	0	2	2	1	3	0	0
Helianthus nuttallii ssp. parishii Los Angeles sunflower	G5TH SH	None None	Rare Plant Rank - 1A	1,000 1,000	8 S:1	0	0	0	0	1	0	1	0	0	1	0
Heuchera parishii Parish's alumroot	G3 S3	None None	Rare Plant Rank - 1B.3 USFS_S-Sensitive	5,600 6,600	70 S:5	0	0	0	0	0	5	5	0	5	0	0

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Horkelia cuneata var. puberula mesa horkelia	G4T2 S2.1	None None	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,100 1,100	58 S:1	0	0	0	0	1	0	1	0	0	1	0
Icteria virens yellow-breasted chat	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	1,460 1,690	84 S:2	0	1	0	0	0	1	0	2	2	0	0
Imperata brevifolia California satintail	G2 S2.1	None None	Rare Plant Rank - 2B.1 USFS_S-Sensitive	1,480 3,800	31 S:4	0	0	0	1	0	3	2	2	4	0	0
Ivesia argyrocoma var. argyrocoma silver-haired ivesia	G2T2 S2.2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	5,620 5,620	41 S:1	0	0	0	1	0	0	0	1	1	0	0
Lampropeltis zonata (parvirubra) California mountain kingsnake (San Bernardino population)	G4G5 S2?	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	3,460 3,460	9 S:1	0	1	0	0	0	0	0	1	1	0	0
Lanius ludovicianus loggerhead shrike	G4 S4	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,460 2,596	94 S:3	0	1	0	0	0	2	0	3	3	0	0
Lasiurus xanthinus western yellow bat	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_H-High Priority	1,050 2,600	57 S:8	0	0	0	0	0	8	6	2	8	0	0
Lasthenia glabrata ssp. coulteri Coulter's goldfields	G4T3 S2.1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	1,430 1,460	89 S:5	2	1	0	0	0	2	1	4	5	0	0
Lepidium virginicum var. robinsonii Robinson's pepper-grass	G5T3 S3	None None	Rare Plant Rank - 4.3	850 2,100	142 S:9	0	0	0	0	0	9	7	2	9	0	0
Lepus californicus bennettii San Diego black-tailed jackrabbit	G5T3? S3?	None None	CDFW_SSC-Species of Special Concern	1,060 2,745	96 S:12	0	3	8	0	0	1	0	12	12	0	0
Lilium parryi lemon lily	G3 S3	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	5,450 7,915	138 S:13	1	0	1	2	0	9	7	6	13	0	0

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Lycium parishii Parish's desert-thorn	G3? S2S3	None None	Rare Plant Rank - 2B.3		14 S:1	0	0	0	0	1	0	1	0	0	0	1
Malacothamnus parishii Parish's bush-mallow	GHQ SH	None None	Rare Plant Rank - 1A	1,290 1,290	1 S:1	0	0	0	0	0	1	1	0	1	0	0
Monardella macrantha ssp. hallii Hall's monardella	G5T3 S3	None None	Rare Plant Rank - 1B.3 USFS_S-Sensitive	3,500 5,300	38 S:5	0	5	0	0	0	0	3	2	5	0	0
Monardella pringlei Pringle's monardella	GX SX	None None	Rare Plant Rank - 1A	1,000 1,000	2 S:1	0	0	0	0	0	1	1	0	1	0	0
Nama stenocarpum mud nama	G4G5 S1S2	None None	Rare Plant Rank - 2B.2	1,400 1,400	22 S:1	0	0	0	0	0	1	0	1	1	0	0
Nasturtium gambelii Gambel's water cress	G1 S1	Endangered Threatened	Rare Plant Rank - 1B.1	1,000 1,000	12 S:1	0	0	0	0	1	0	1	0	0	0	1
Neotamias speciosus speciosus lodgepole chipmunk	G4T2T3 S2S3	None None		6,800 7,300	24 S:3	0	0	0	0	0	3	3	0	3	0	0
Neotoma lepida intermedia San Diego desert woodrat	G5T3? S3?	None None	CDFW_SSC-Species of Special Concern	1,200 1,630	115 S:5	0	2	2	0	0	1	1	4	5	0	0
Nyctinomops femorosaccus pocketed free-tailed bat	G4 S2S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_M-Medium Priority	1,200 1,600	90 S:2	0	0	0	0	0	2	2	0	2	0	0
Onychomys torridus ramona southern grasshopper mouse	G5T3? S3?	None None	CDFW_SSC-Species of Special Concern	1,180 2,000	26 S:3	0	0	0	0	0	3	3	0	3	0	0
Packera bernardina San Bernardino ragwort	G2 S2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	7,000 7,000	35 S:1	0	0	0	0	0	1	1	0	1	0	0
Perideridia parishii ssp. parishii Parish's yampah	G4T3T4 S2.2?	None None	Rare Plant Rank - 2B.2	5,600 7,480	37 S:8	0	0	1	0	0	7	2	6	8	0	0
Perognathus alticolus alticolus white-eared pocket mouse	G1G2TH SH	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered USFS_S-Sensitive	5,500 6,153	3 S:3	0	0	0	0	3	0	3	0	0	3	0

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Perognathus longimembris brevinasus Los Angeles pocket mouse	G5T1T2 S1S2	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	1,000 2,000	49 S:16	1	3	4	1	0	7	7	9	16	0	0
Phrynosoma blainvillii coast horned lizard	G3G4 S3S4	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	1,000 4,600	677 S:23	1	8	0	0	2	12	17	6	21	0	2
Plegadis chihi white-faced ibis	G5 S1	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	1,425 1,425	20 S:1	0	0	0	0	0	1	1	0	1	0	0
Polioptila californica californica coastal California gnatcatcher	G3T2 S2	Threatened None	ABC_WLBCC-Watch List of Birds of Conservation Concern CDFW_SSC-Species of Special Concern	1,100 2,180	807 S:14	0	3	2	0	1	8	7	7	13	0	1
Rana draytonii California red-legged frog	G2G3 S2S3	Threatened None	CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	2,600 2,600	1335 S:1	0	1	0	0	0	0	1	0	1	0	0
Rana muscosa southern mountain yellow-legged frog	G1 S1	Endangered Endangered	CDFW_SSC-Species of Special Concern IUCN_EN-Endangered USFS_S-Sensitive	1,800 6,680	167 S:5	0	1	0	0	3	1	3	2	2	1	2
Rhaphiomidas terminatus abdominalis Delhi Sands flower-loving fly	G1T1 S1	Endangered None		1,000 1,180	13 S:6	0	1	3	0	1	1	0	6	5	1	0
Rhinichthys osculus ssp. 3 Santa Ana speckled dace	G5T1 S1	None None	AFS_TH-Threatened CDFW_SSC-Species of Special Concern USFS_S-Sensitive	1,525 2,080	14 S:3	0	3	0	0	0	0	0	3	3	0	0
Ribes divaricatum var. parishii Parish's gooseberry	G4TH SH	None None	Rare Plant Rank - 1A	1,000 1,000	4 S:1	0	0	0	0	1	0	1	0	0	1	0
Riversidian Alluvial Fan Sage Scrub Riversidian Alluvial Fan Sage Scrub	G1 S1.1	None None		1,300 2,900	30 S:4	0	1	1	0	1	1	4	0	3	0	1
Schoenus nigricans black bog-rush	G4 S2.2	None None	Rare Plant Rank - 2B.2 USFS_S-Sensitive	1,950 1,950	13 S:1	0	0	0	0	0	1	0	1	1	0	0
Sidalcea hickmanii ssp. parishii Parish's checkerbloom	G3T1 S1	None Rare	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	4,600 4,600	17 S:1	0	0	0	0	0	1	1	0	1	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Sidalcea malviflora ssp. dolosa Bear Valley checkerbloom	G5T2T3 S2S3	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive		18 S:1	0	0	0	0	0	1	1	0	1	0	0
Sidalcea neomexicana Salt Spring checkerbloom	G4? S2S3	None None	Rare Plant Rank - 2B.2 USFS_S-Sensitive	1,050 1,050	15 S:1	0	0	0	0	0	1	1	0	1	0	0
Sidalcea pedata bird-foot checkerbloom	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1	6,040 6,040	24 S:1	0	0	0	0	1	0	1	0	0	0	1
Southern Coast Live Oak Riparian Forest Southern Coast Live Oak Riparian Forest	G4 S4	None None		1,780 1,820	246 S:2	0	0	0	0	0	2	2	0	2	0	0
Southern Cottonwood Willow Riparian Forest Southern Cottonwood Willow Riparian Forest	G3 S3.2	None None		860 2,840	111 S:3	0	0	0	0	0	3	3	0	3	0	0
Southern Mixed Riparian Forest Southern Mixed Riparian Forest	G2 S2.1	None None		1,980 1,980	14 S:1	0	0	0	0	0	1	1	0	1	0	0
Southern Riparian Forest Southern Riparian Forest	G4 S4	None None		2,160 2,160	20 S:1	0	0	0	0	0	1	1	0	1	0	0
Southern Riparian Scrub Southern Riparian Scrub	G3 S3.2	None None		1,360 1,840	56 S:2	0	0	0	0	0	2	2	0	2	0	0
Southern Sycamore Alder Riparian Woodland Southern Sycamore Alder Riparian Woodland	G4 S4	None None		1,100 3,000	230 S:16	0	0	0	0	0	16	16	0	16	0	0
Southern Willow Scrub Southern Willow Scrub	G3 S2.1	None None		2,200 2,200	45 S:1	0	0	0	0	0	1	1	0	1	0	0
Spea hammondii western spadefoot	G3 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened	1,510 2,525	423 S:7	0	1	2	0	0	4	2	5	7	0	0
Sphenopholis obtusata prairie wedge grass	G5 S2.2	None None	Rare Plant Rank - 2B.2	800 1,000	19 S:2	0	0	0	0	0	2	2	0	2	0	0

Summary Table Report

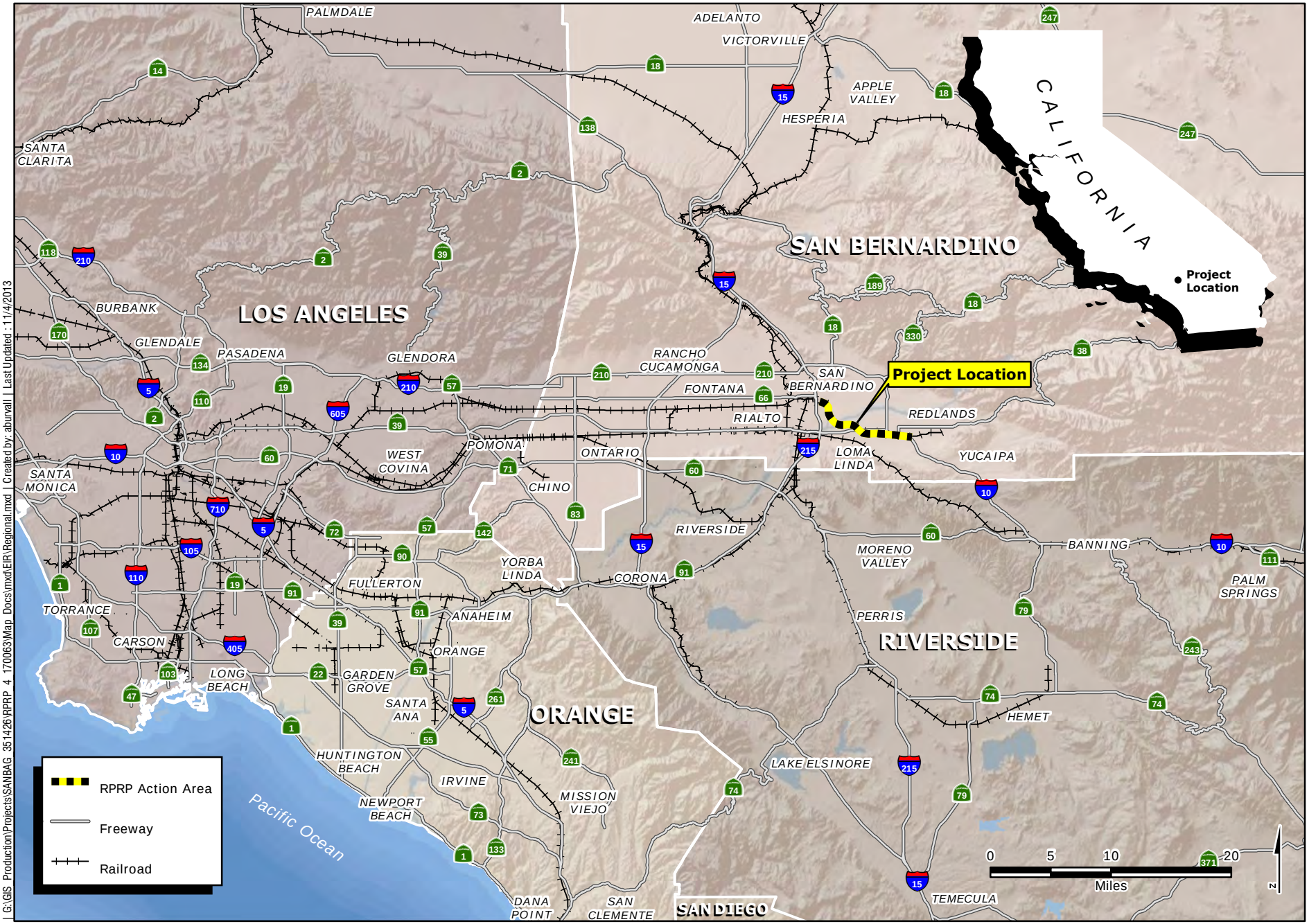
California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Spinus lawrencei Lawrence's goldfinch	G3G4 S3	None None	ABC_WLBCC-Watch List of Birds of Conservation Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,690 1,690	3 S:1	0	1	0	0	0	0	0	1	1	0	0
Streptanthus bernardinus Laguna Mountains jewel-flower	G3 S3	None None	Rare Plant Rank - 4.3	5,990 7,100	22 S:7	0	3	1	0	0	3	6	1	7	0	0
Streptanthus campestris southern jewel-flower	G2 S2.3	None None	Rare Plant Rank - 1B.3 USFS_S-Sensitive	4,000 6,200	40 S:4	0	0	0	1	0	3	3	1	4	0	0
Symphyotrichum defoliatum San Bernardino aster	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	2,000 2,000	76 S:3	0	0	0	0	1	2	3	0	2	0	1
Taxidea taxus American badger	G5 S4	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	1,040 5,200	471 S:3	0	0	0	0	0	3	3	0	3	0	0
Thamnophis hammondii two-striped garter snake	G4 S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	1,955 3,460	143 S:7	2	2	1	0	1	1	1	6	6	1	0
Thelypteris puberula var. sonorensis Sonoran maiden fern	G5T3 S2.2?	None None	Rare Plant Rank - 2B.2 USFS_S-Sensitive	2,000 2,000	21 S:1	0	0	1	0	0	0	0	1	1	0	0
Trichocoronis wrightii var. wrightii Wright's trichocoronis	G4T3 S1	None None	Rare Plant Rank - 2B.1	1,420 1,420	9 S:1	0	0	0	0	0	1	1	0	1	0	0
Vireo bellii pusillus least Bell's vireo	G5T2 S2	Endangered Endangered	ABC_WLBCC-Watch List of Birds of Conservation Concern IUCN_NT-Near Threatened	790 2,000	315 S:8	1	1	4	0	0	2	1	7	8	0	0

APPENDIX C

Project Figures



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Regional Location Map

Figure 1

FTA/SANBAG | Redlands Passenger Rail Project | BA

RPRP Action Area

0 1,000 2,000 4,000

Feet

N

USGS Topographic Map

Figure 2 a

FTA/SANBAG | Redlands Passenger Rail Project | BA

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RPRP Action Area

0 1,000 2,000 4,000 Feet

N

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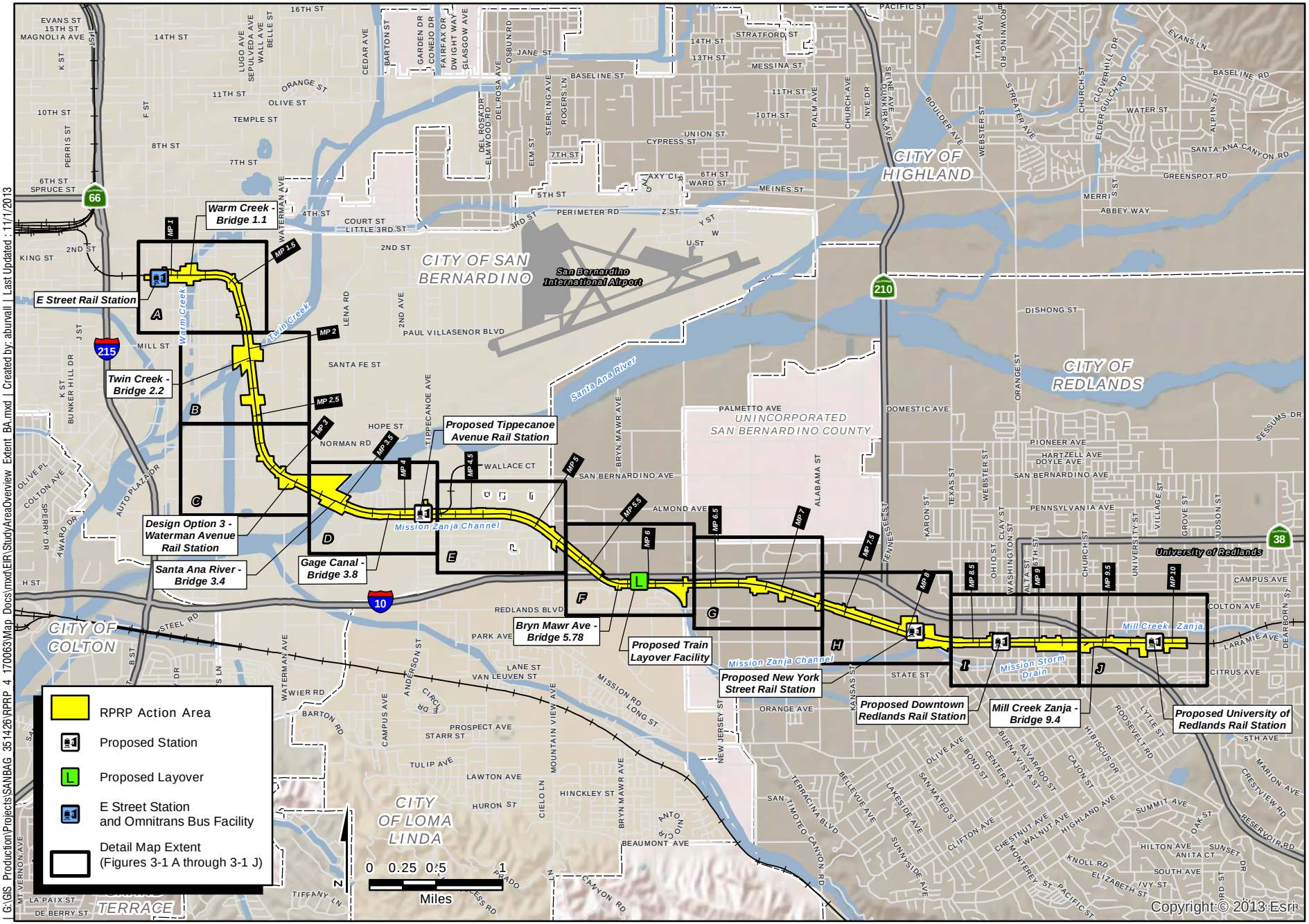
USGS Topographic Map

Figure 2b



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RPRP Action Area Overview

Figure 3

FTA/SANBAG | Redlands Passenger Rail Project | BA

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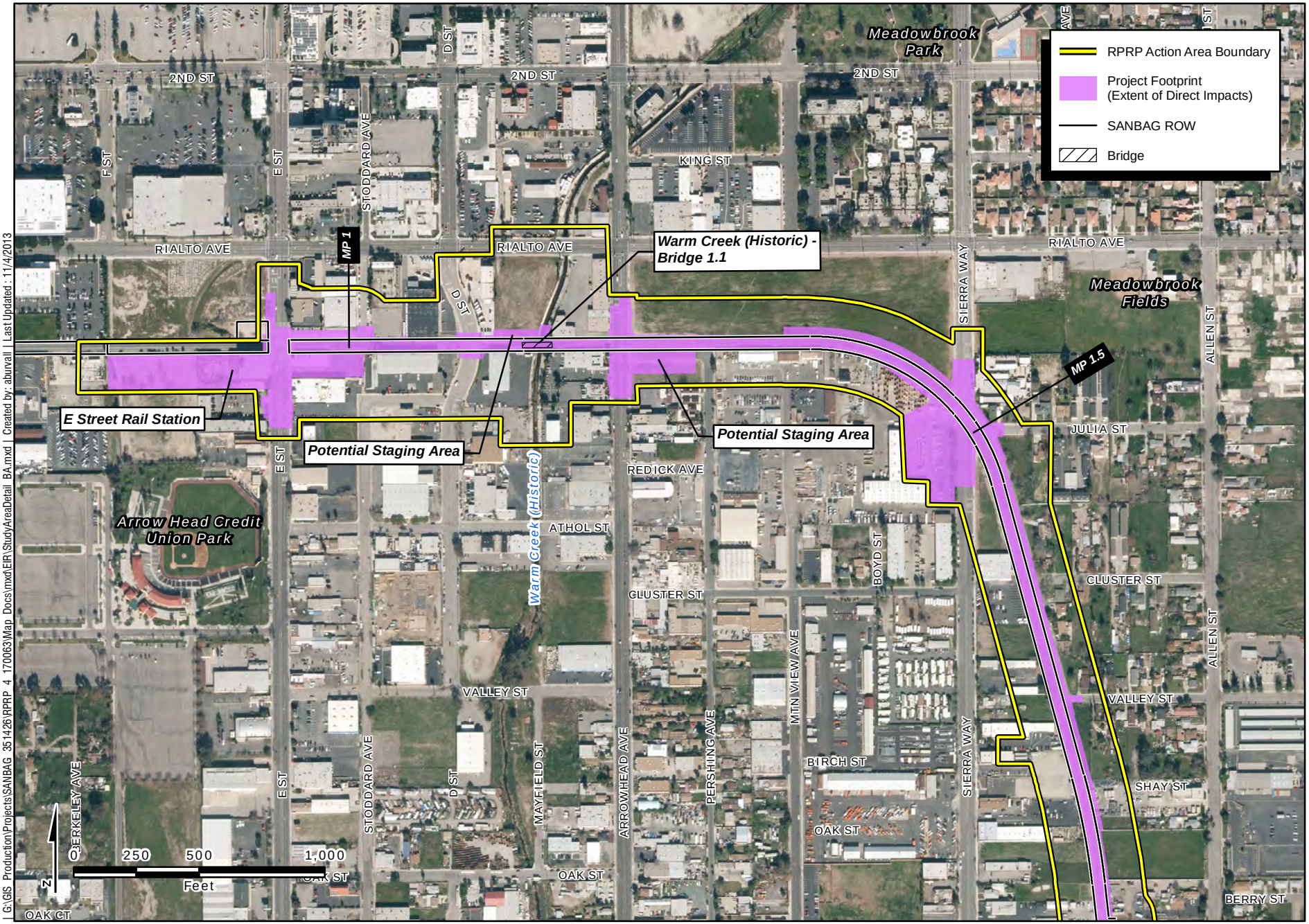

RPRP Action Area Detail – MP 1 to MP 1.8

Figure 3 A

FTA/SANBAG | Redlands Passenger Rail Project | BA

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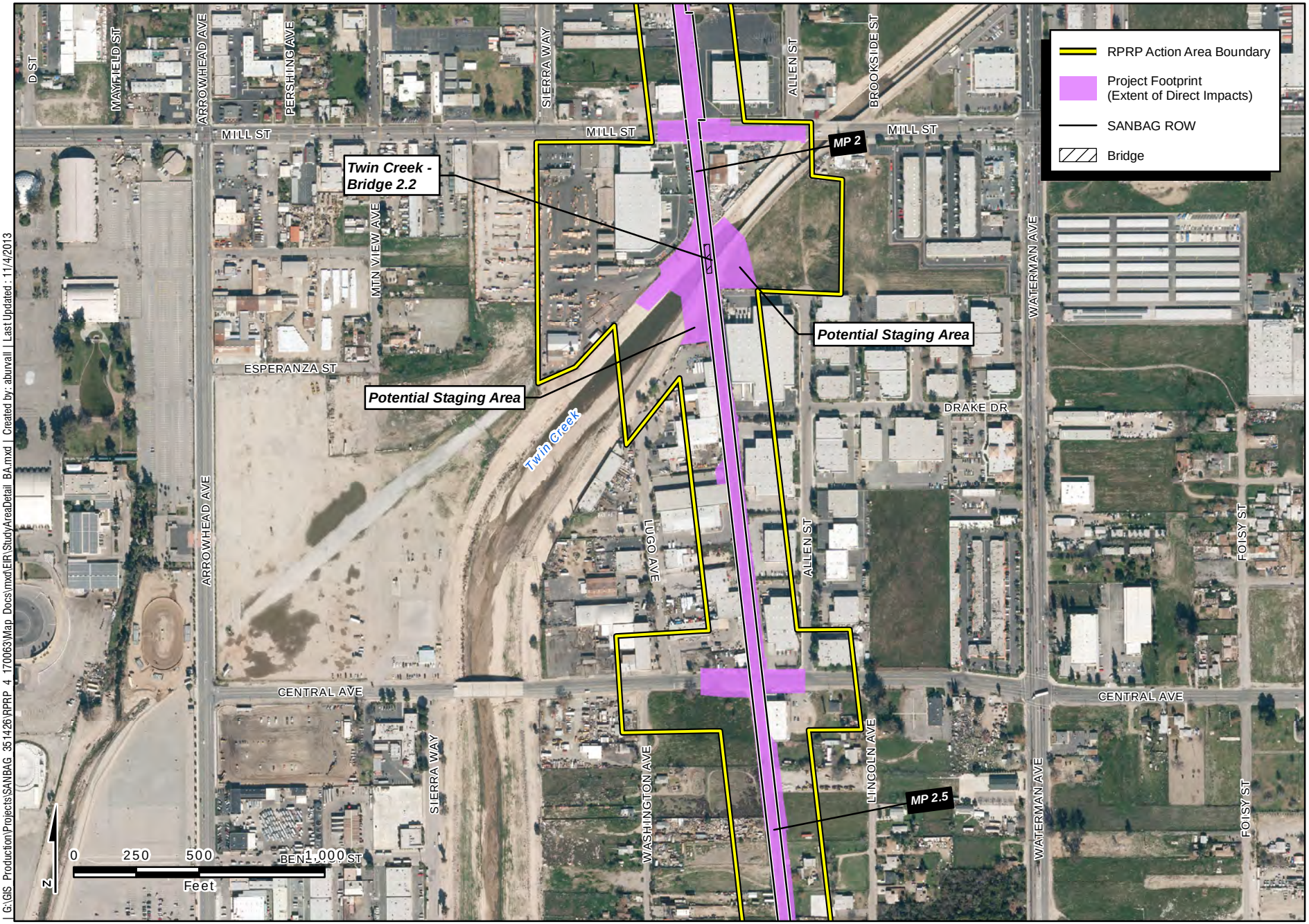

RPRP Action Area Detail – MP 1.9 to MP 2.6

Figure 3 B

FTA/SANBAG | Redlands Passenger Rail Project | BA

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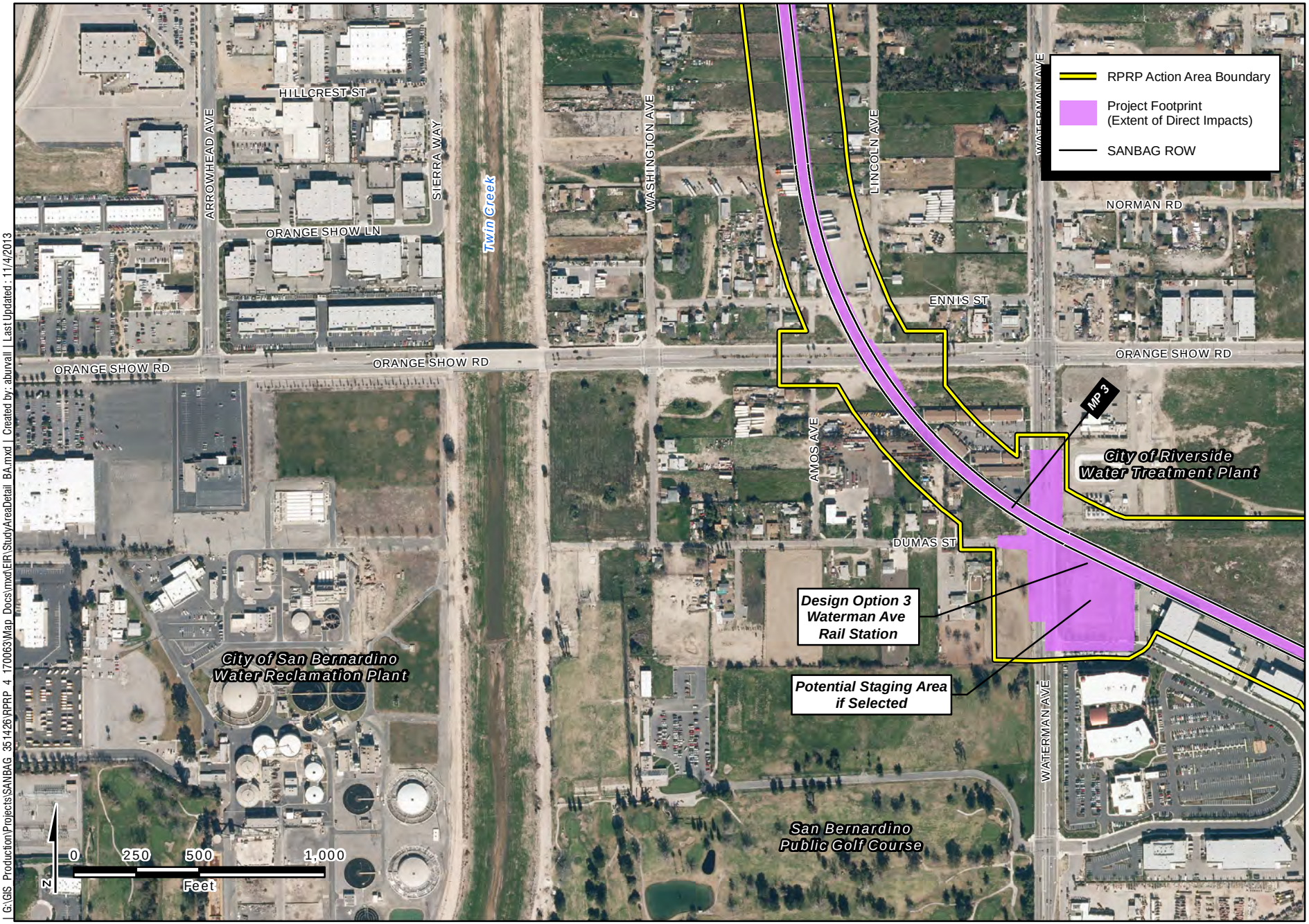

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RPRP Action Area Detail – MP 2.7 to MP 3.2

Figure 3 C

FTA/SANBAG | Redlands Passenger Rail Project | BA

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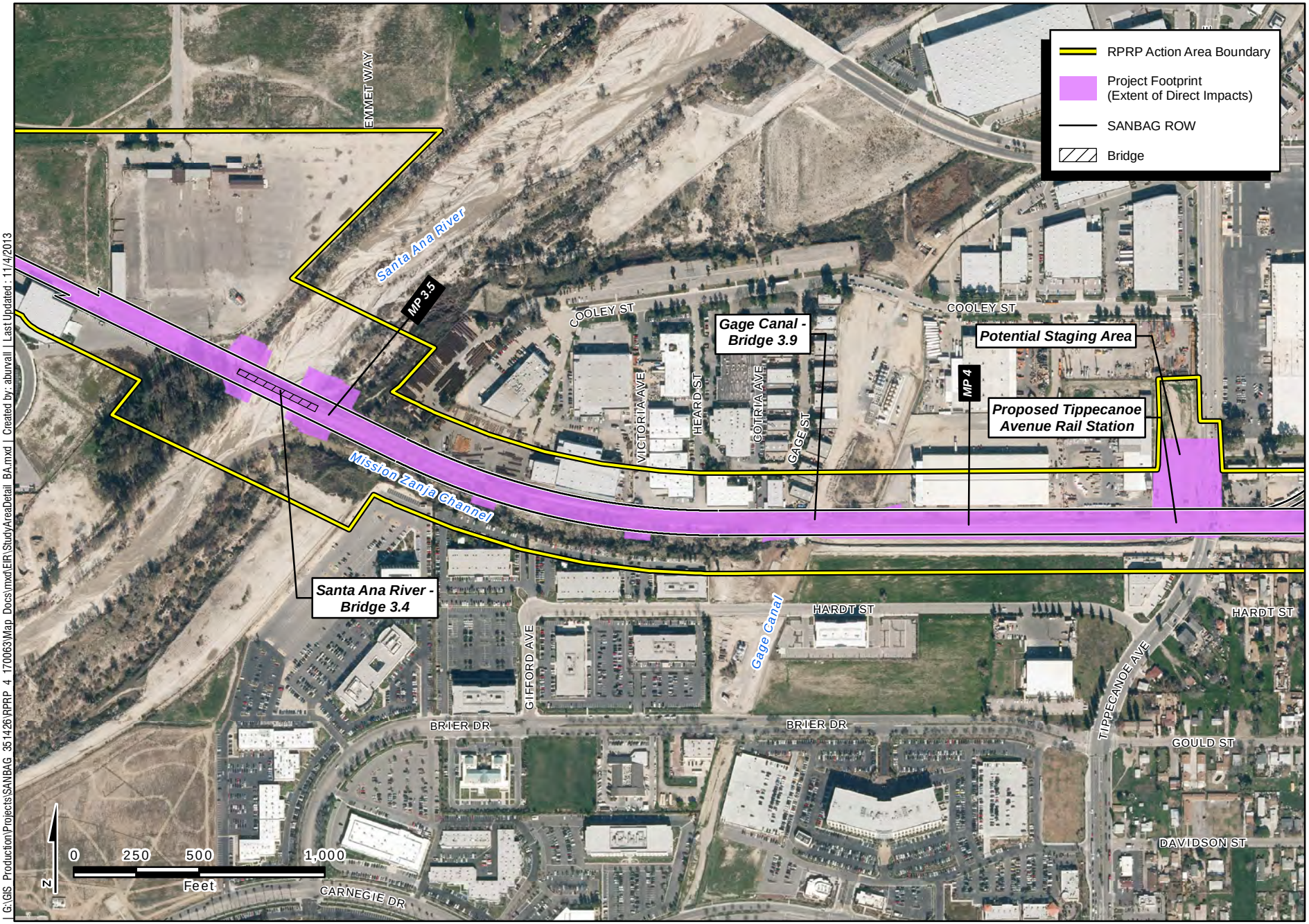

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RPRP Action Area Detail – MP 3.3 to MP 4.2

Figure 3 D

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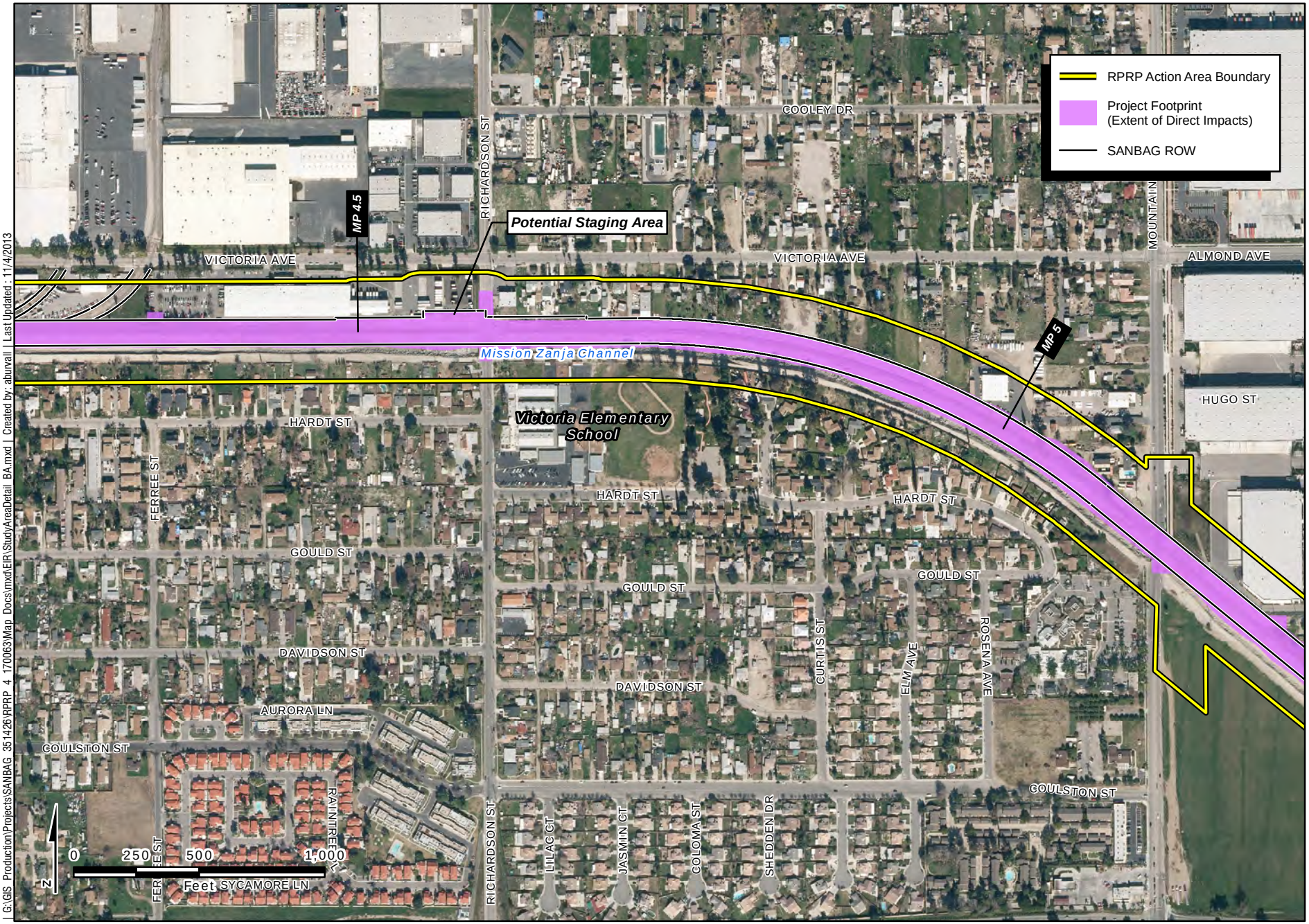

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RPRP Action Area Detail – MP 4.3 to 5.2

Figure 3 E

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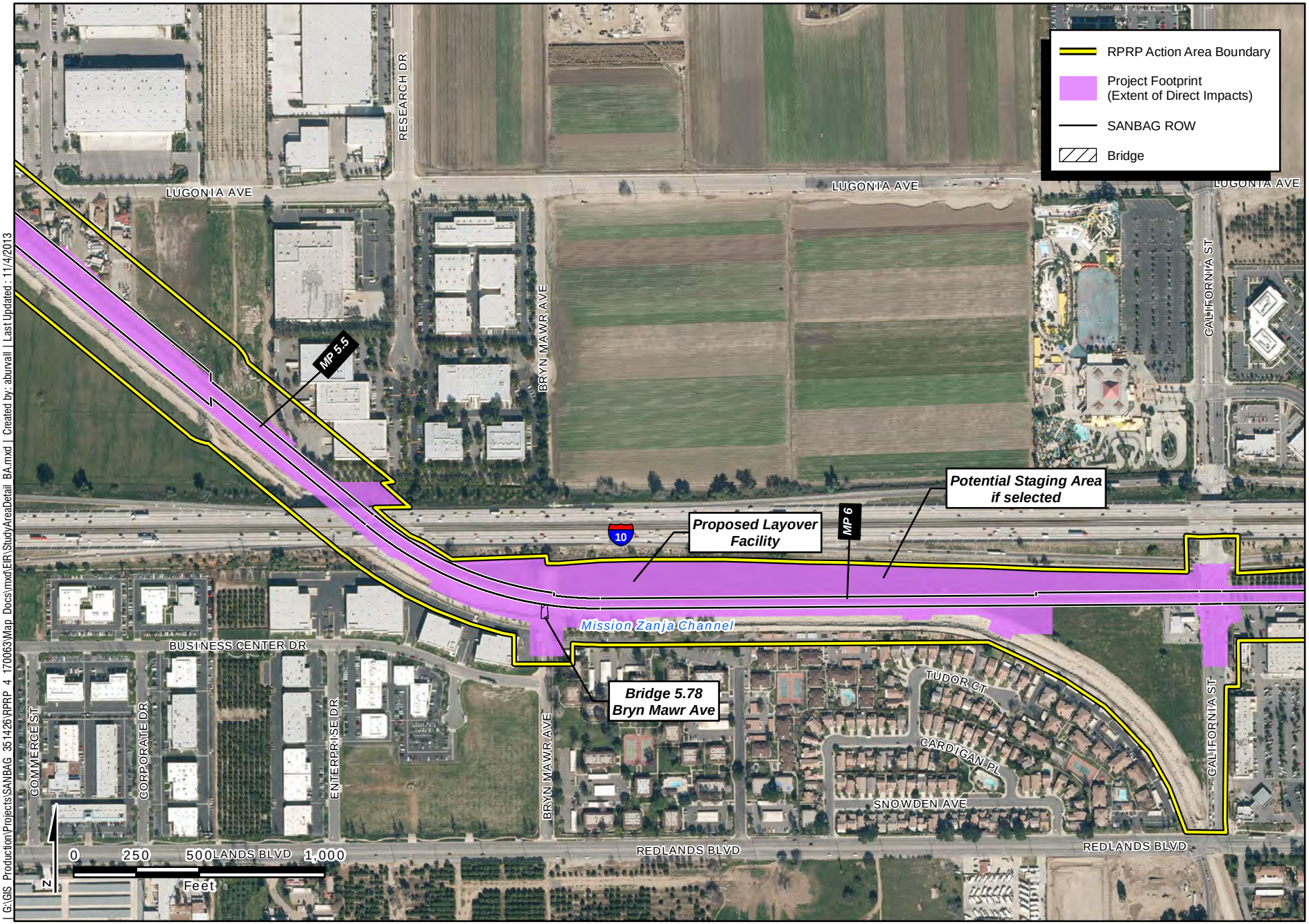

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RPRP Action Area Detail – MP 5.3 to MP 6.3

Figure 3 F

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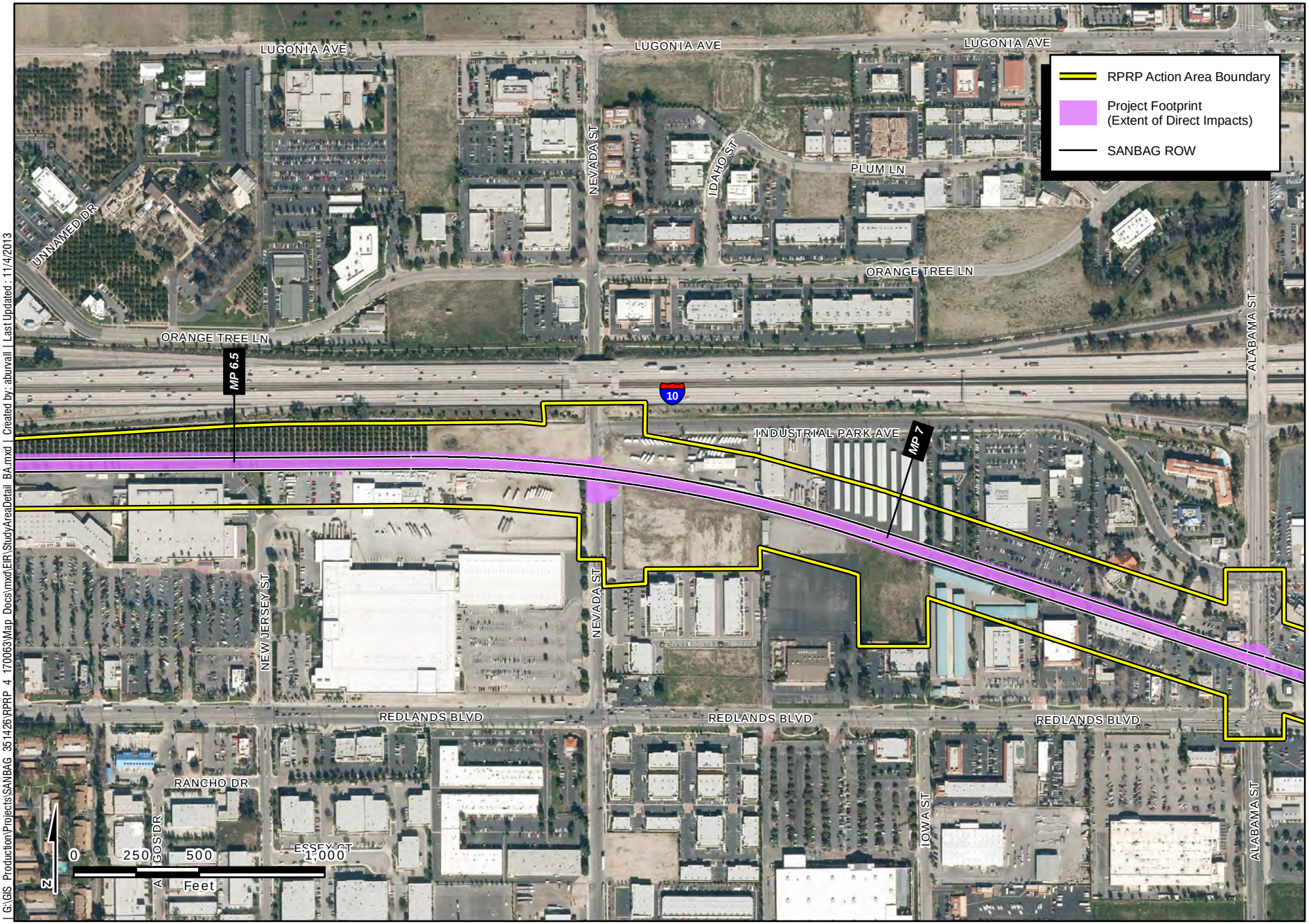

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RPRP Action Area Detail – MP 6.4 to MP 7.3

Figure 3 G

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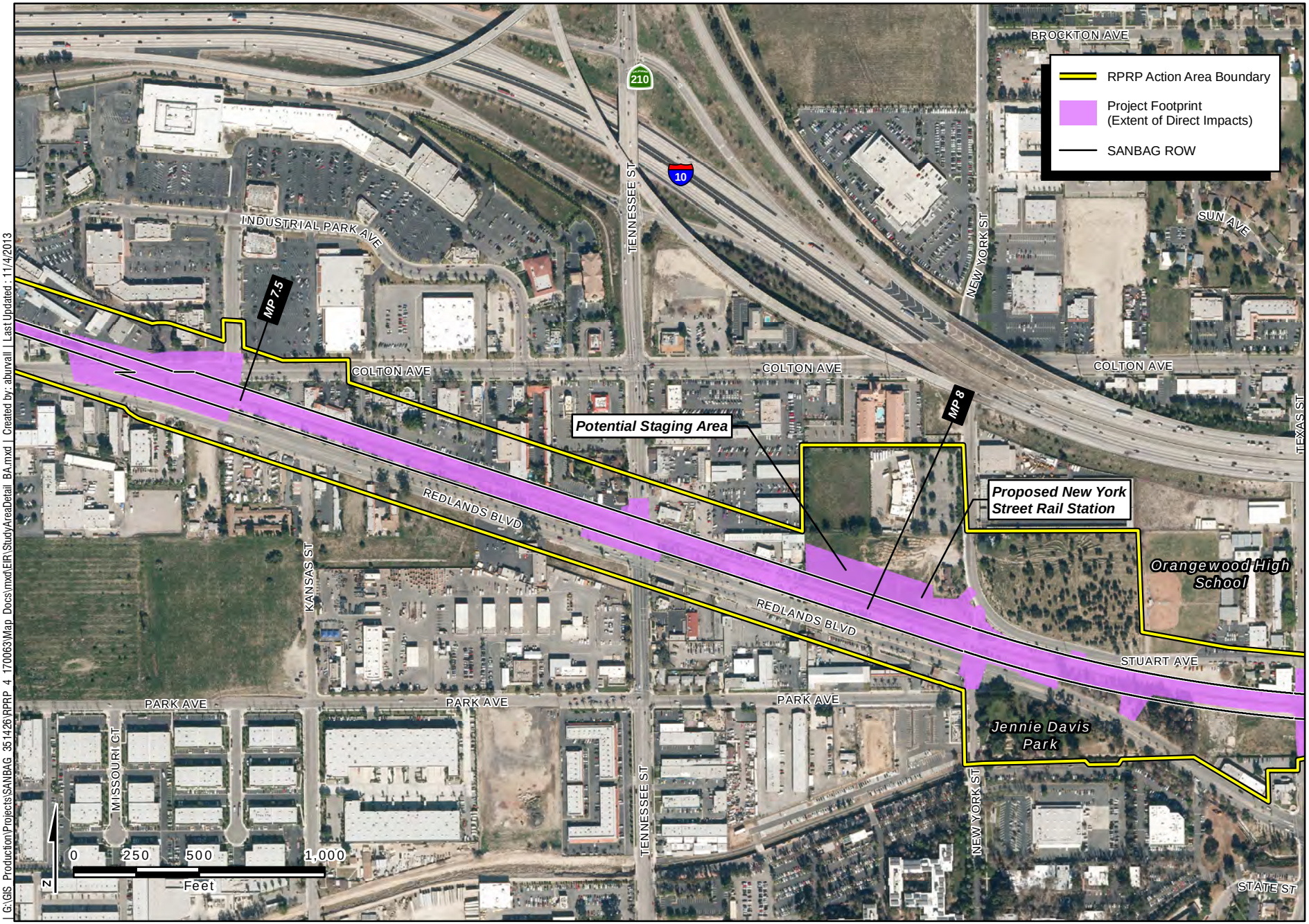

RPRP Action Area Detail – MP 7.4 to MP 8.3

Figure 3 H

FTA/SANBAG | Redlands Passenger Rail Project | BA

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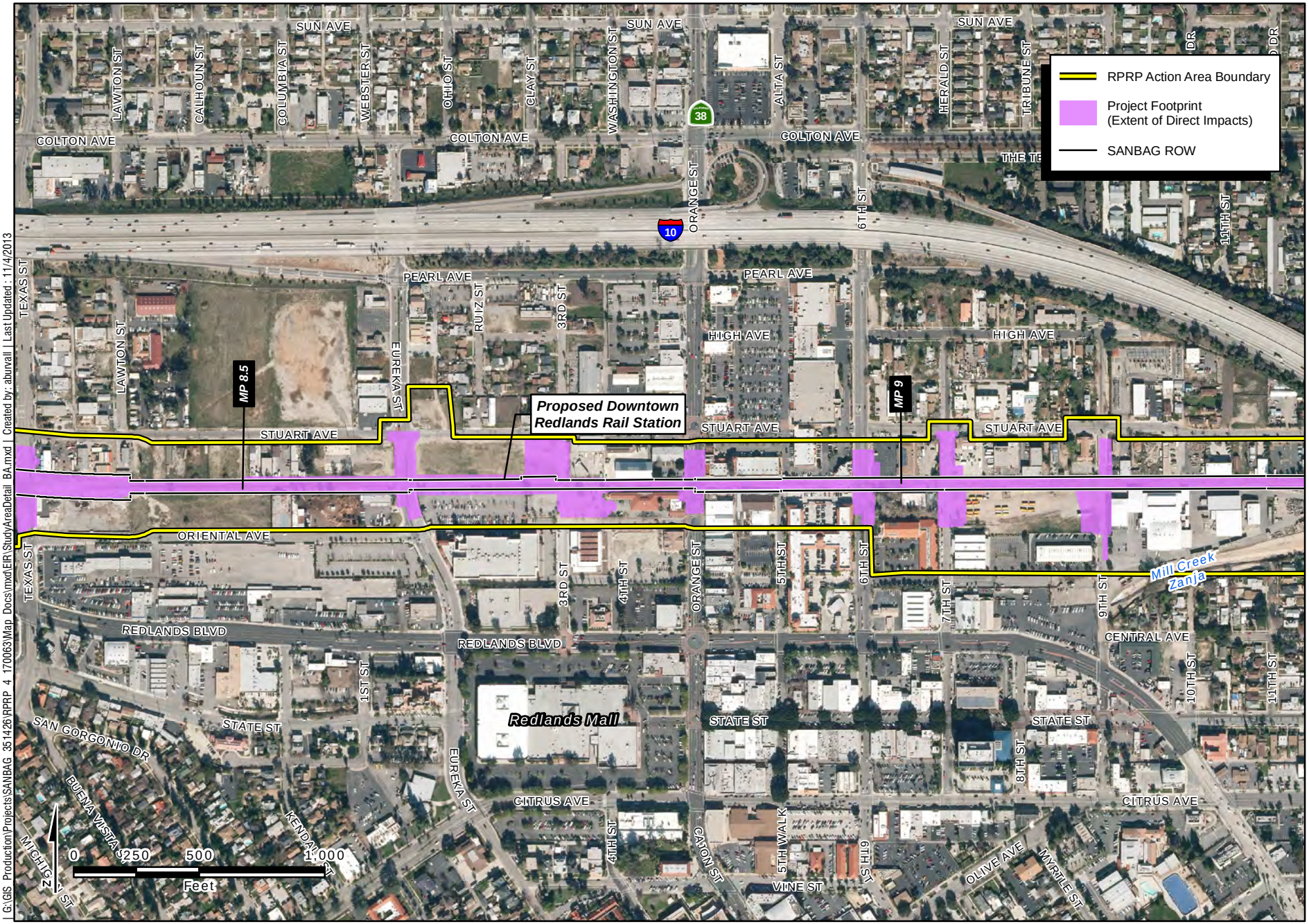

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RPRP Action Area Detail – MP 8.4 to MP 9.3

Figure 3 I

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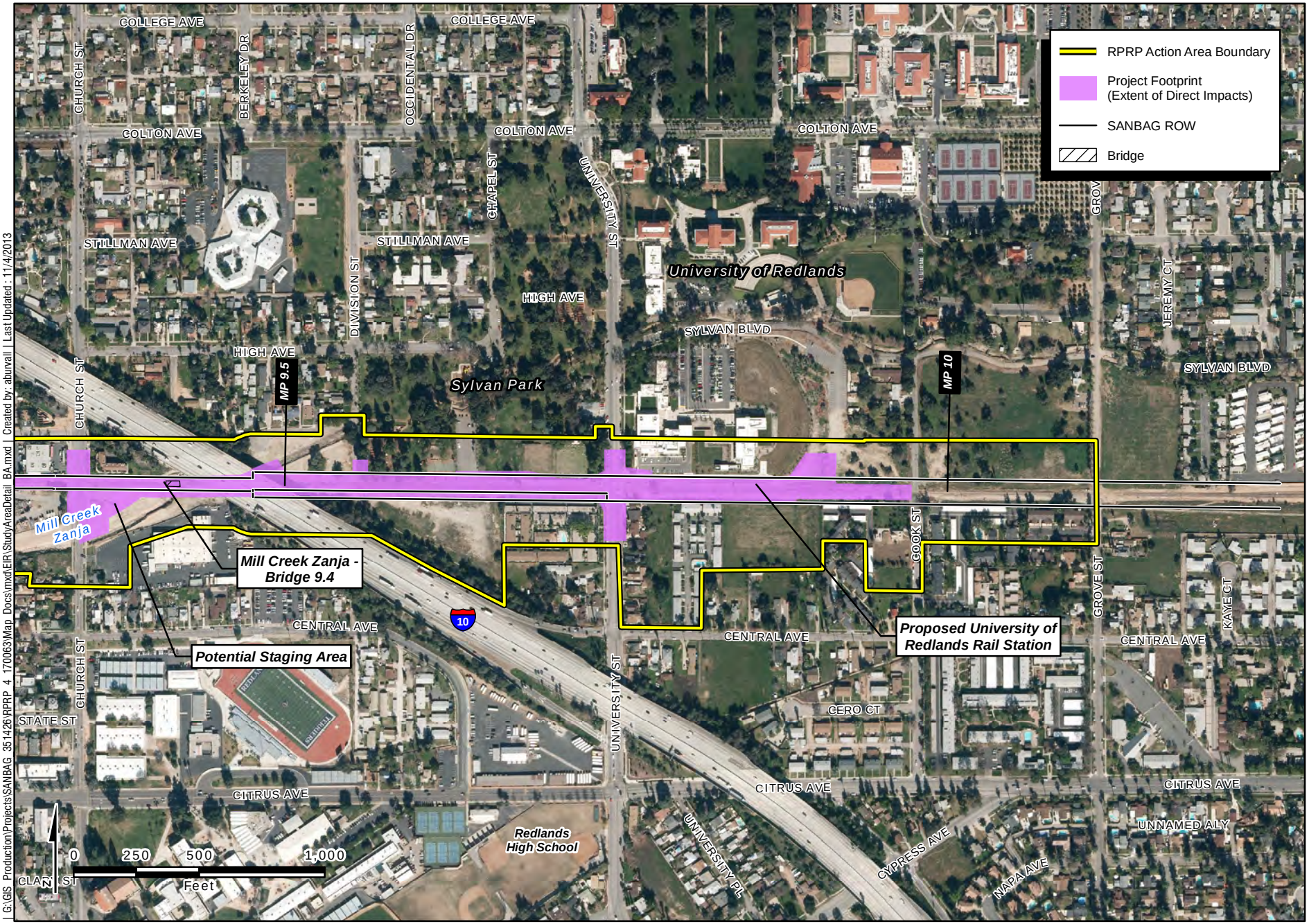

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RPRP Action Area Detail – MP 9.4 to MP 10.1

Figure 3 J

FTA/SANBAG | Redlands Passenger Rail Project | BA

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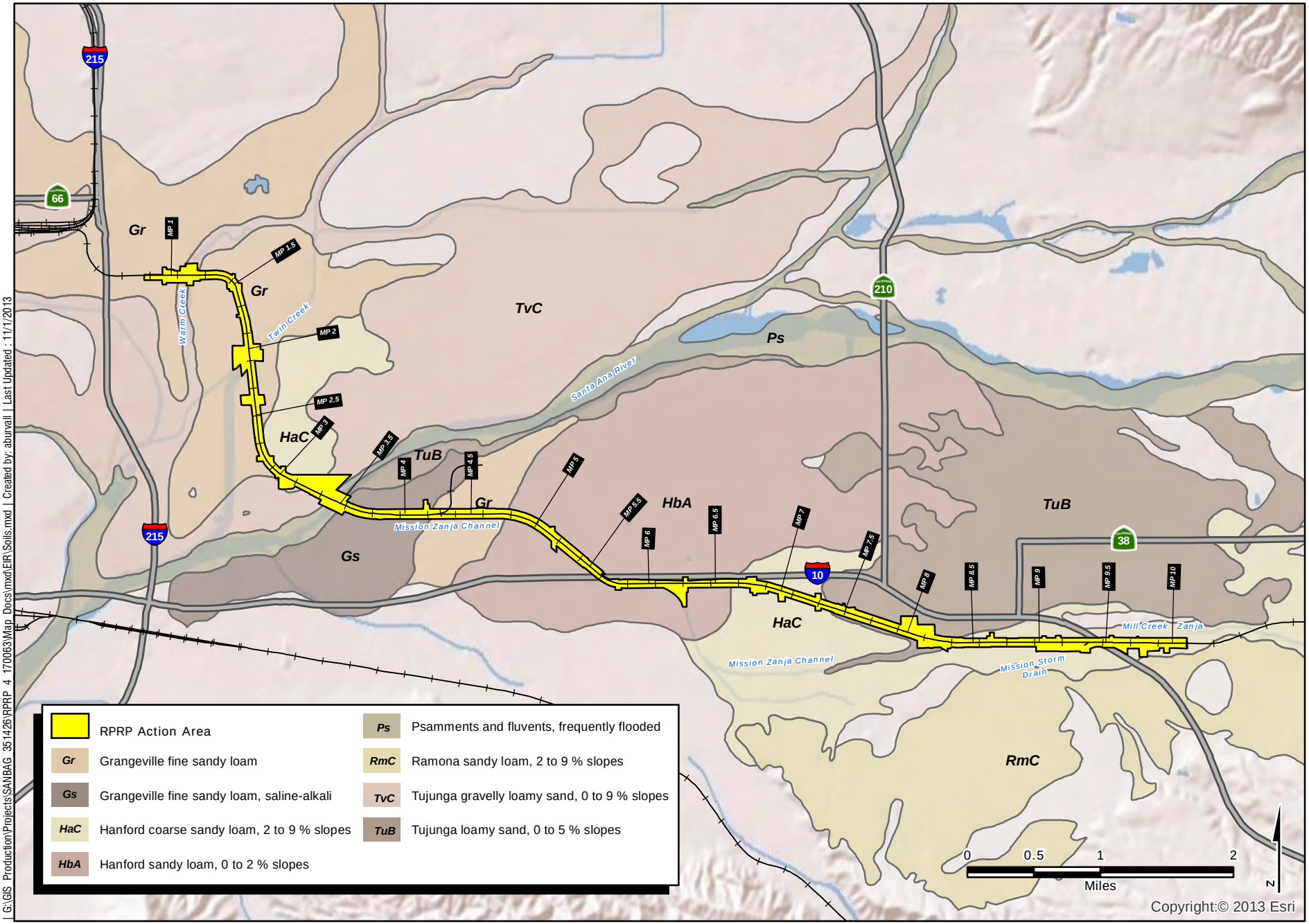

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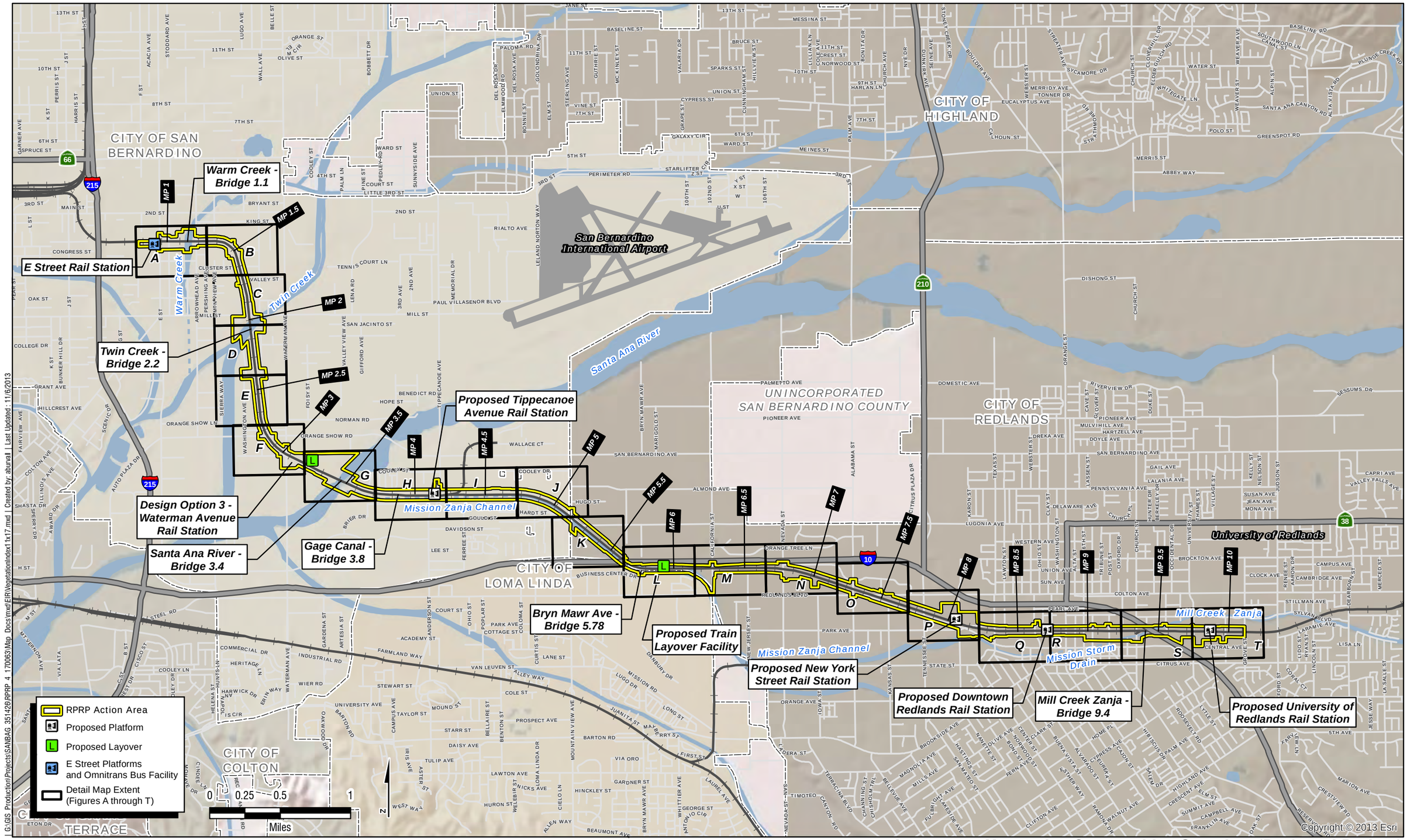
Soils

Figure 4

FTA/SANBAG | Redlands Passenger Rail Project | BA



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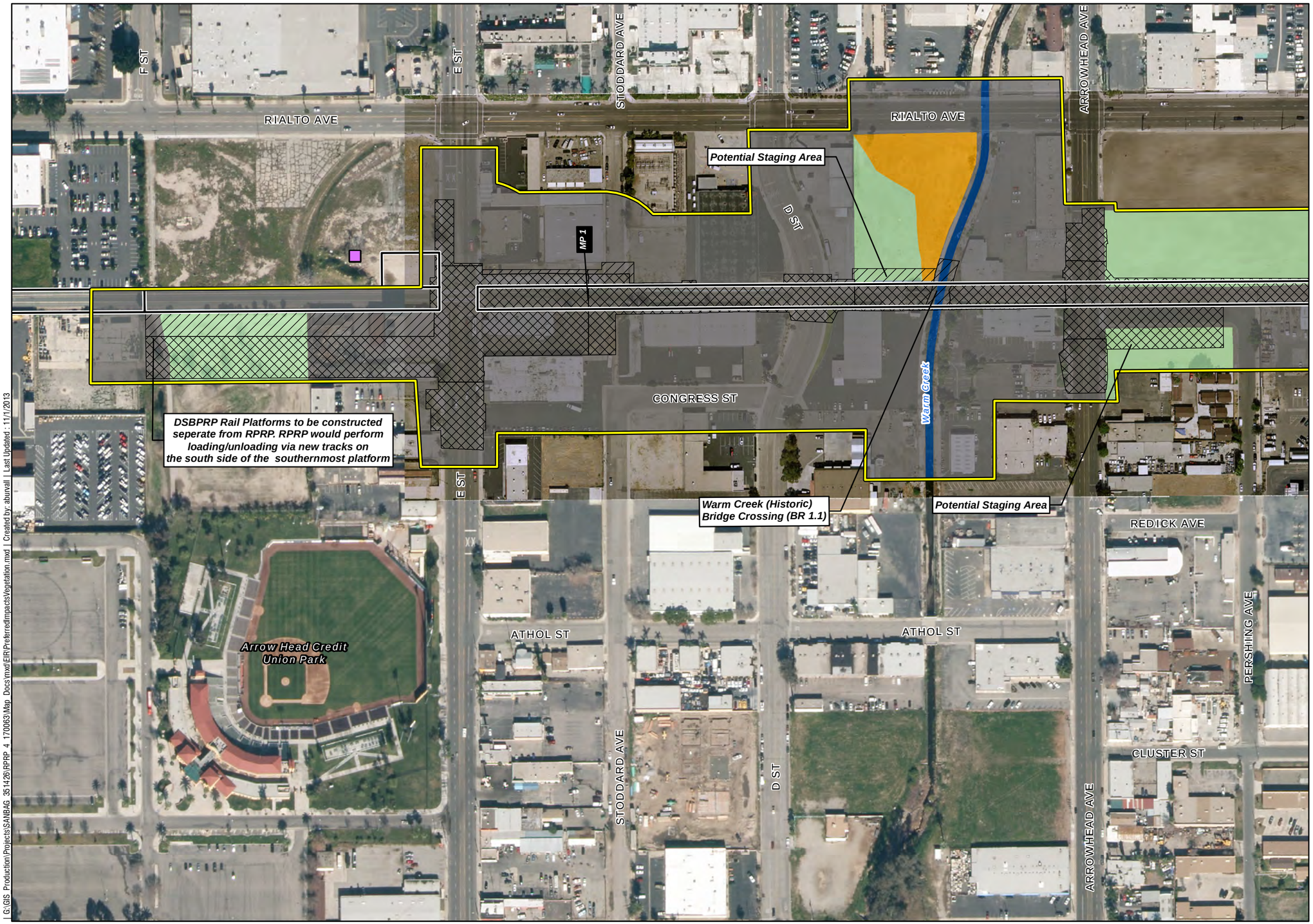
Impacts on Vegetation Communities Overview (Preferred Project)

Figure 5



RPRP Action Area

Footprint

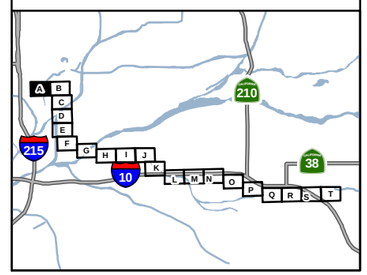
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 5 A

FTA/SANBAG | Redlands Passenger Rail Project | BA

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RPRP Action Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

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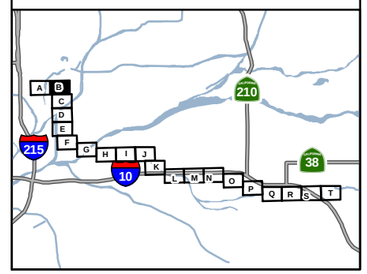
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 5 B

FTA/SANBAG | Redlands Passenger Rail Project | BA

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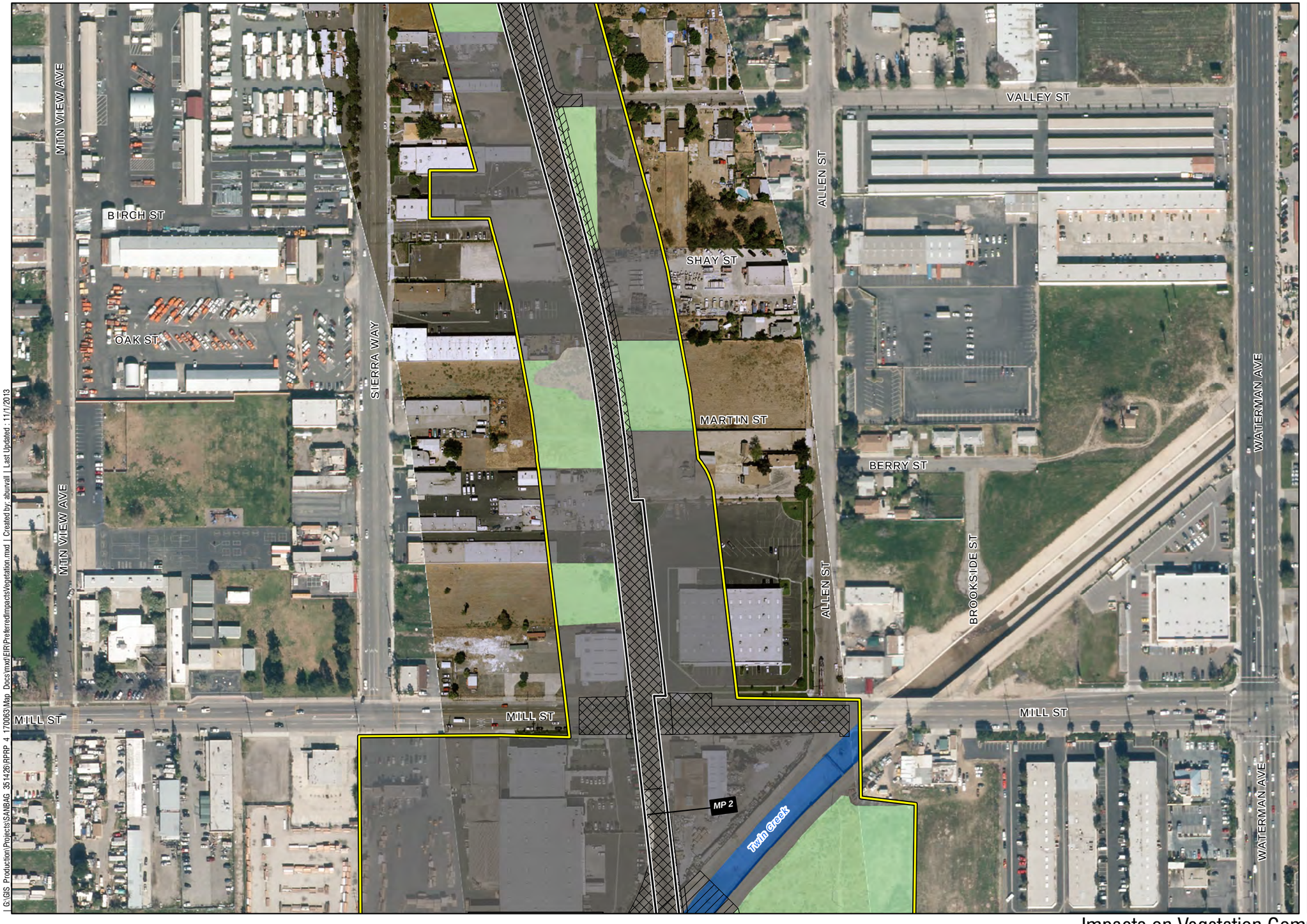

RPRP Action Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

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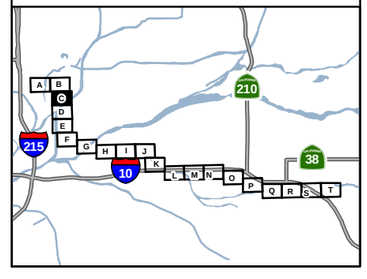

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 C

FTA/SANBAG | Redlands Passenger Rail Project | BA

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RPRP Action Area

Footprint

- Permanent Impacts
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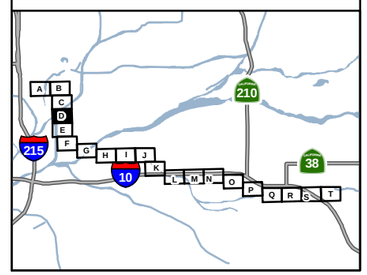

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 D

FTA/SANBAG | Redlands Passenger Rail Project | BA

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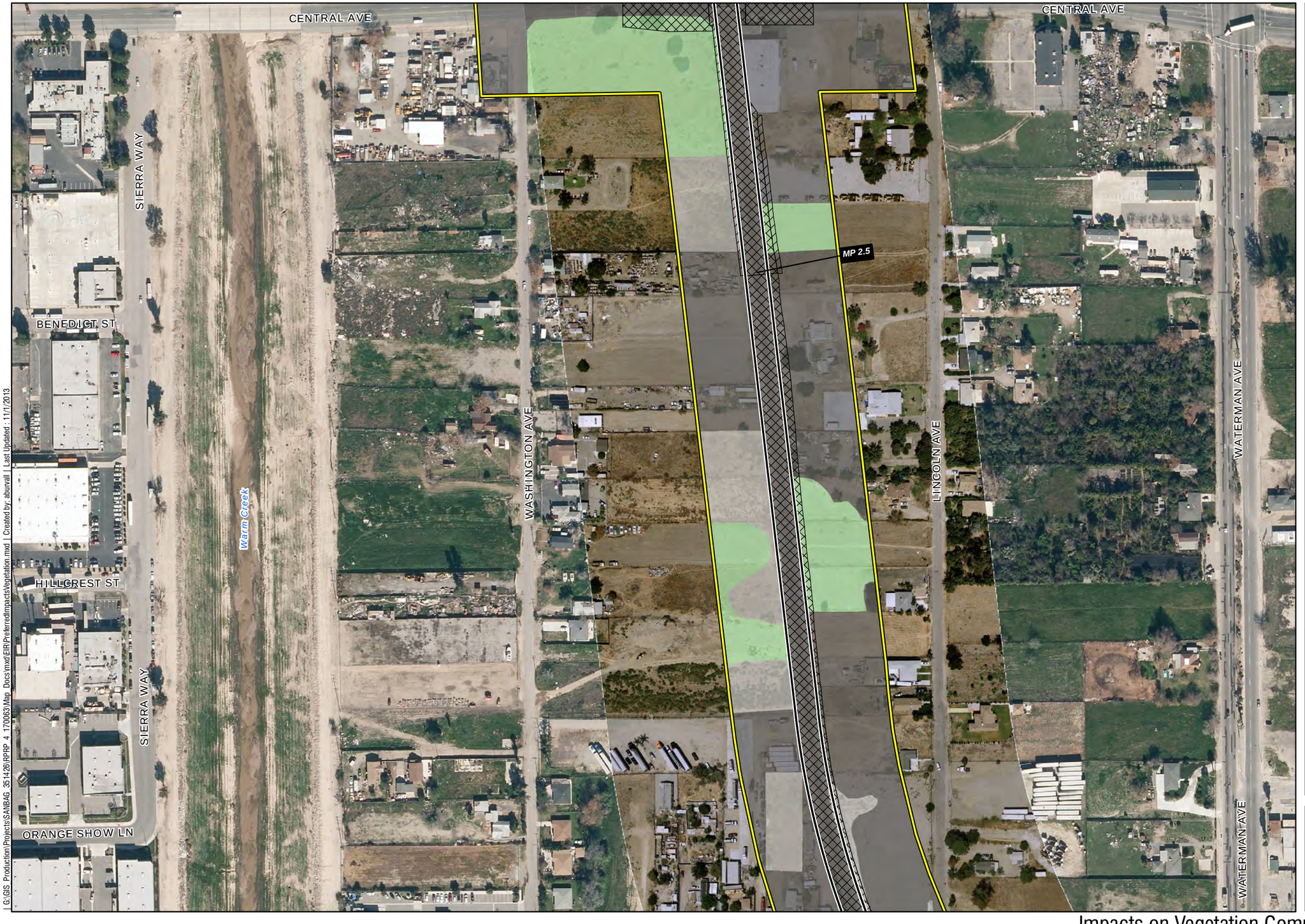

RPRP Action Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
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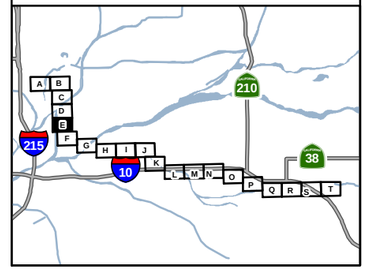

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 E

FTA/SANBAG | Redlands Passenger Rail Project | BA

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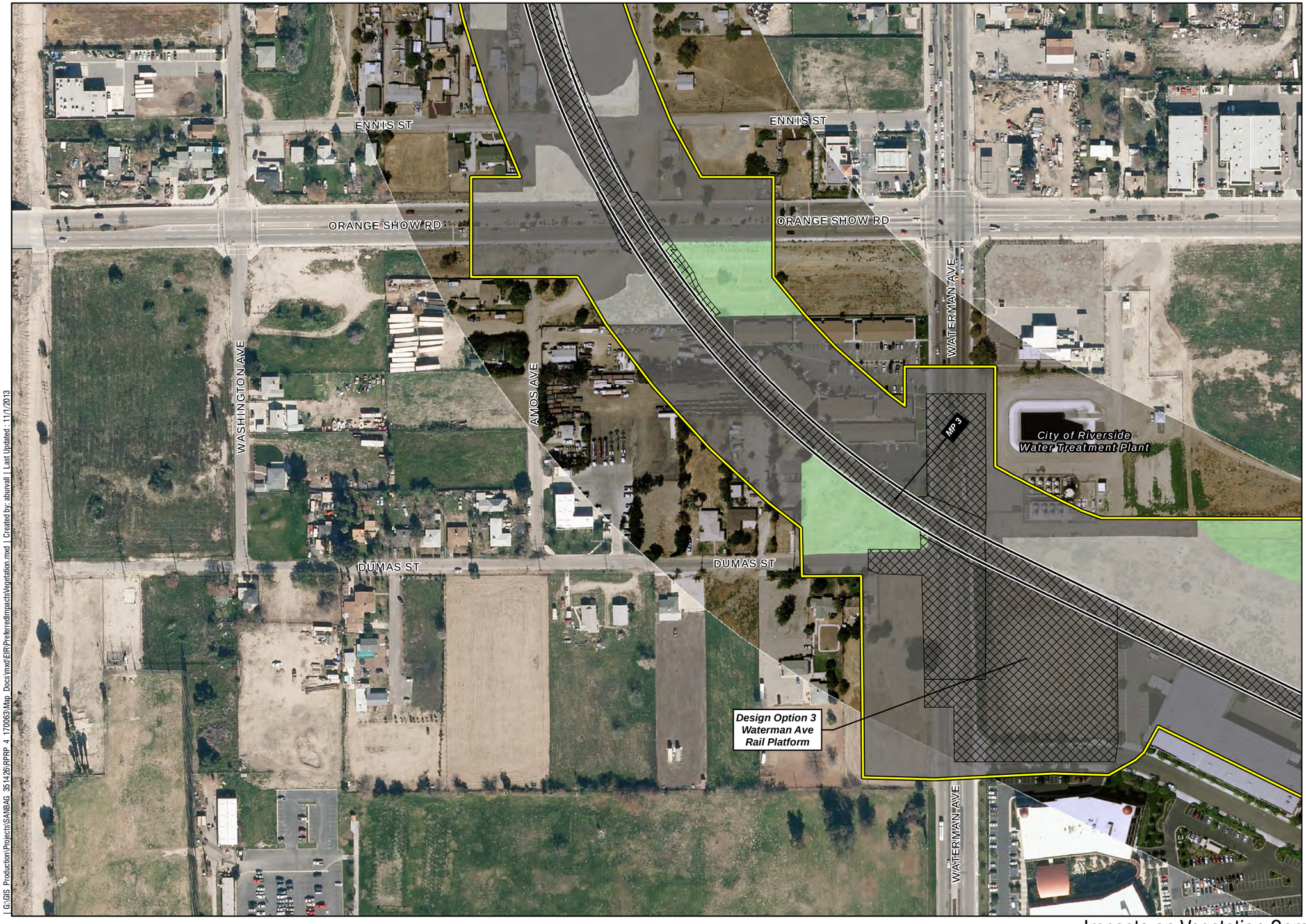

RPRP Action Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

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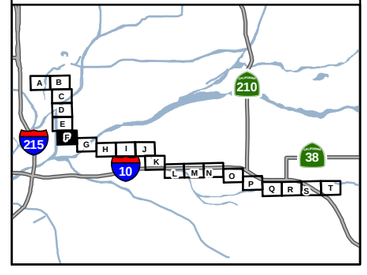

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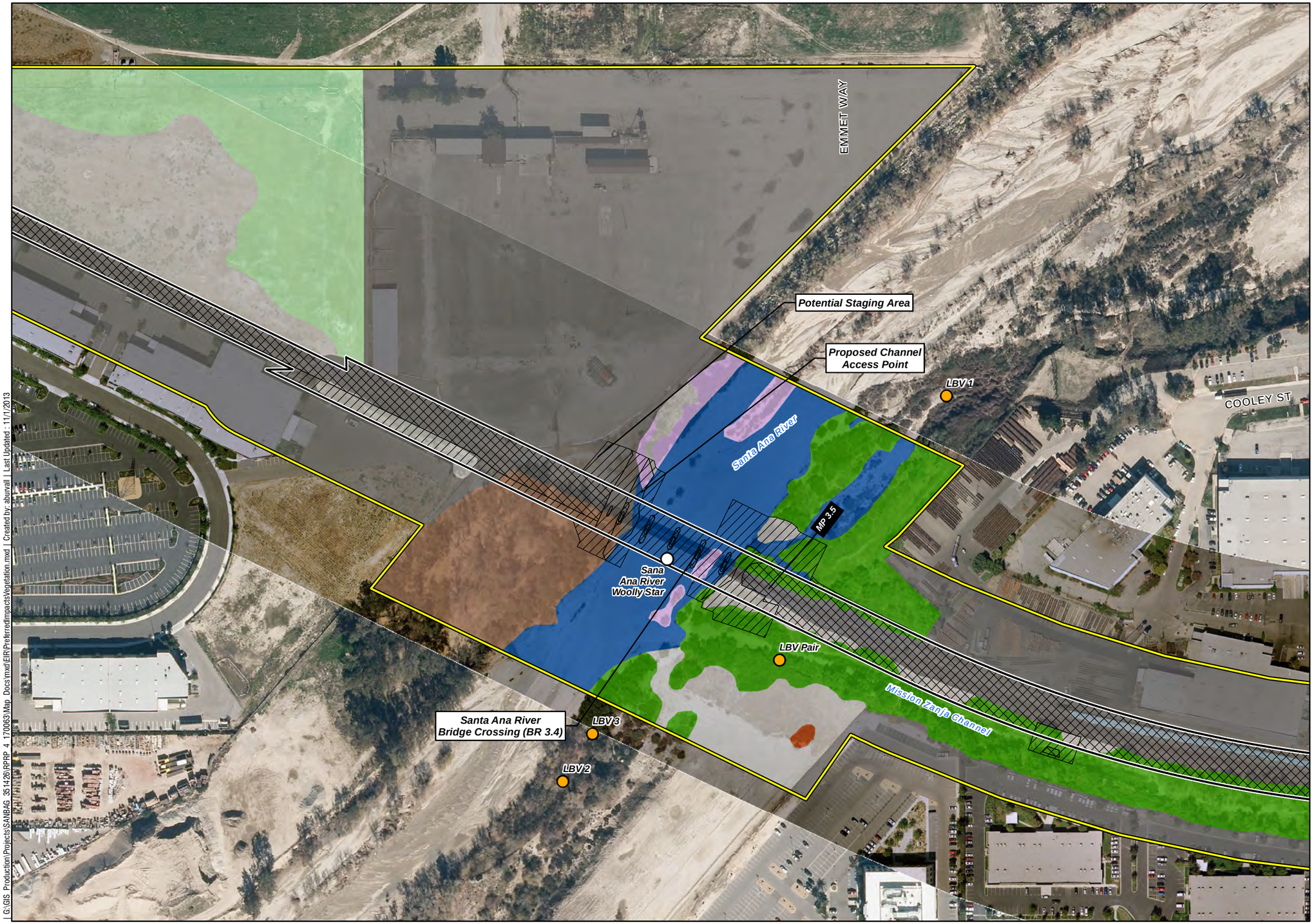
Impacts on Vegetation Communities (Preferred Project)

Figure 5 F

FTA/SANBAG | Redlands Passenger Rail Project | BA



RPRP Action Area

Footprint

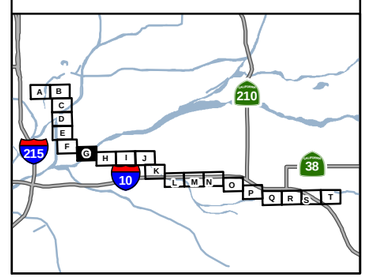
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 5 G

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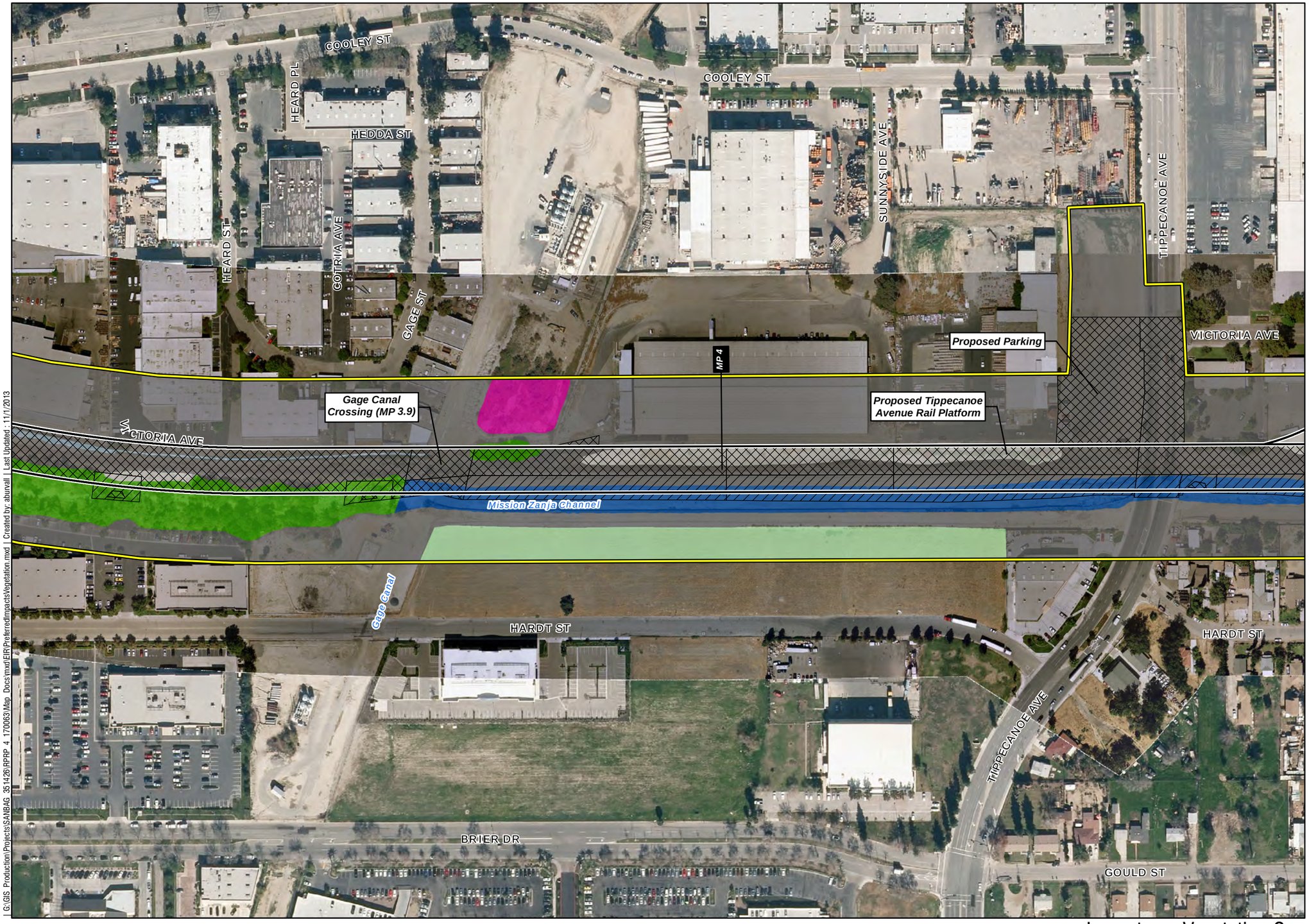

RPRP Action Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
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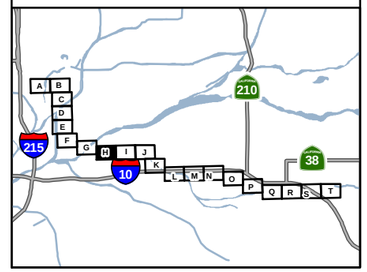

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 H

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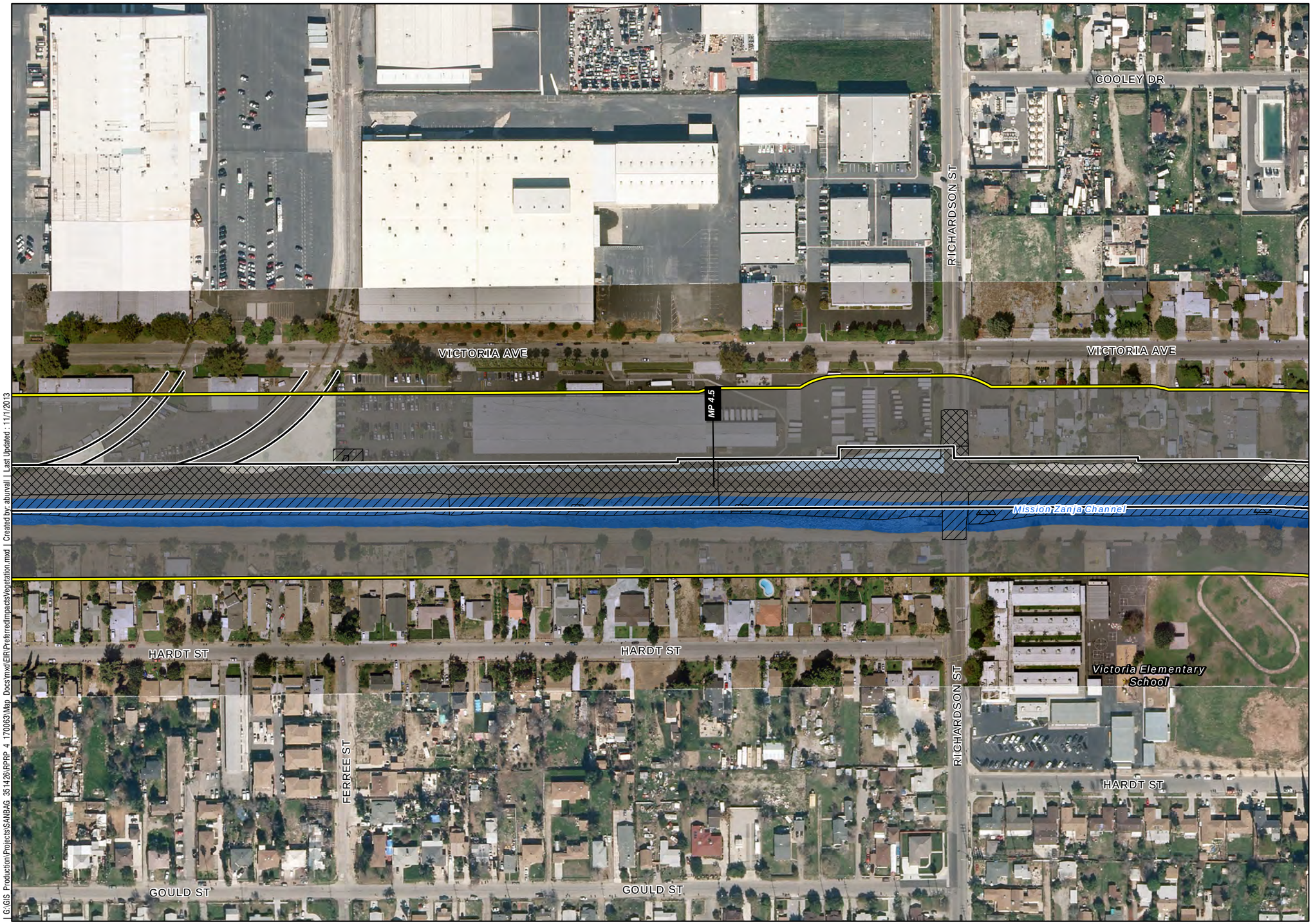

RPRP Action Area

Footprint

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- Railroad ROW

Vegetation Community

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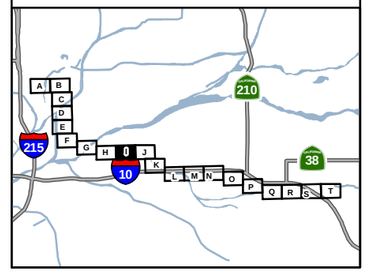

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 I

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RPRP Action Area

Footprint

- Permanent Impacts
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- Railroad ROW

Vegetation Community

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Species Observation

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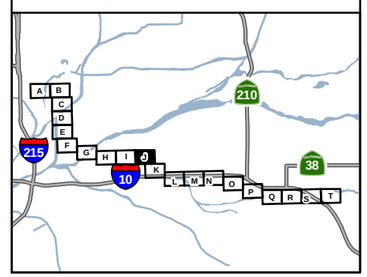

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 J

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RPRP Action Area

Footprint

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- Railroad ROW

Vegetation Community

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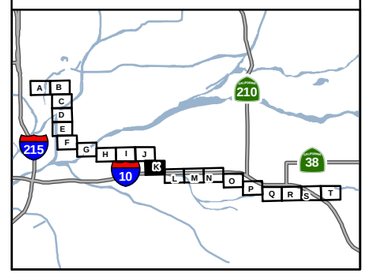

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 K

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RPRP Action Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

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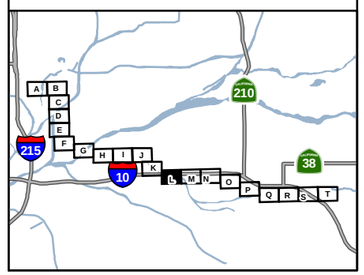

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 L

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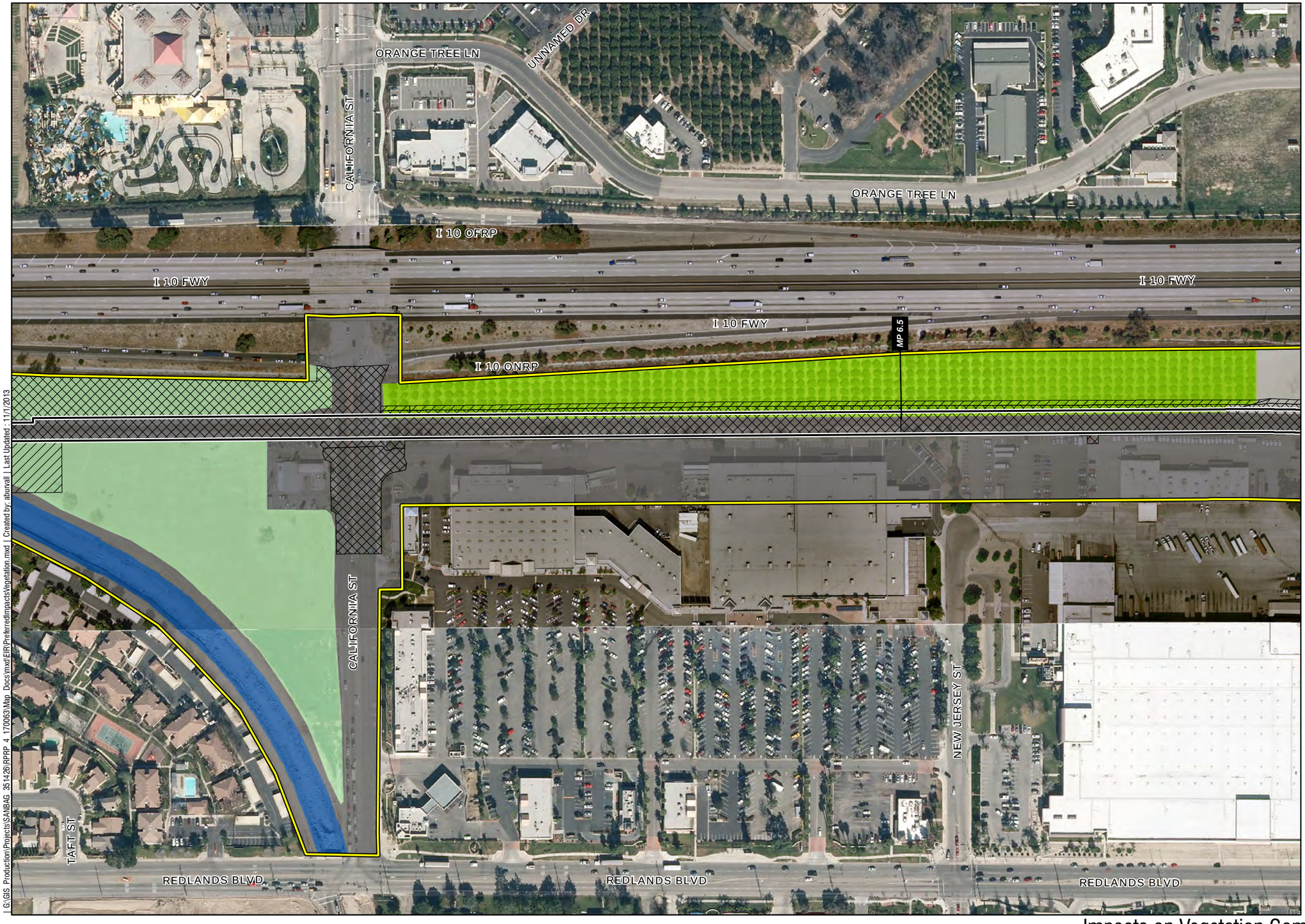

RPRP Action Area

Footprint

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- Temporary Impacts
- Railroad ROW

Vegetation Community

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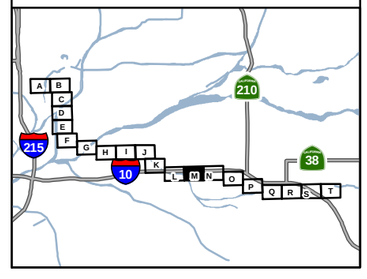

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 M

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I 10 FWY
I 10 FWY
I 10 FWY
I 10 OFRP
INDUSTRIAL PARK AVE
MP 7
NEVADA ST
REDLANDS BLVD
REDLANDS BLVD

RPRP Action Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

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Species Observation

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- Least Bell's Vireo
- Sana Ana River Woolly Star

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 N

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RPRP Action Area

Footprint

- Permanent Impacts
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- Railroad ROW

Vegetation Community

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Species Observation

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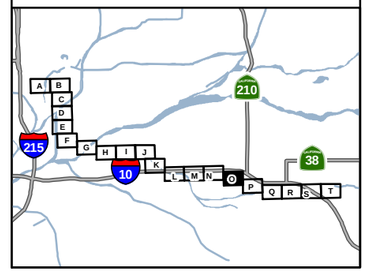

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 0

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RPRP Action Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

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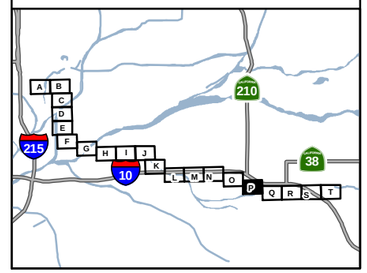

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Impacts on Vegetation Communities (Preferred Project)

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 Q

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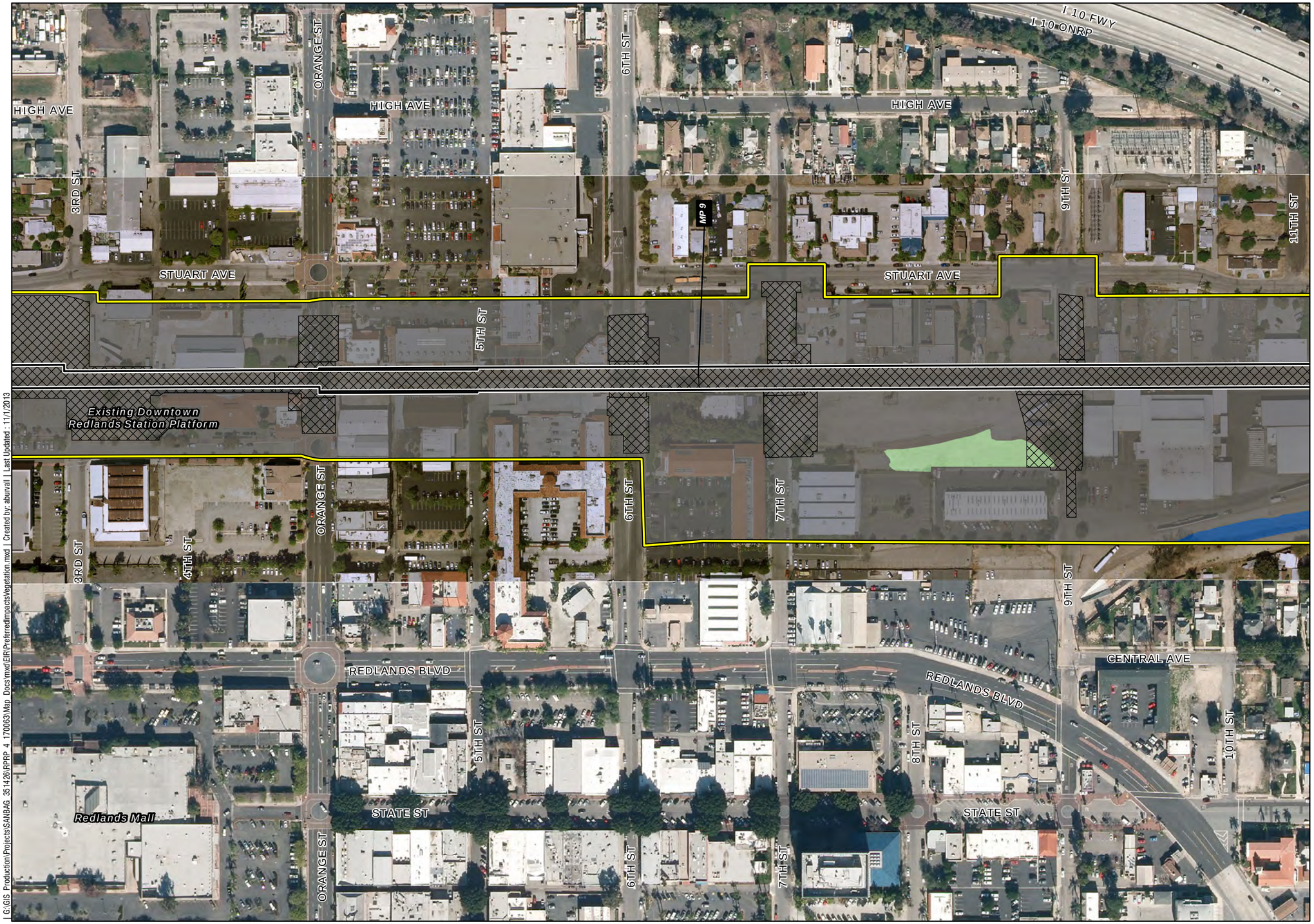

RPRP Action Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

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Species Observation

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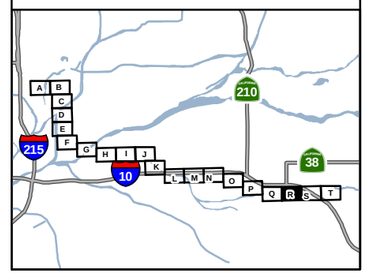

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 R

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RPRP Action Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

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Species Observation

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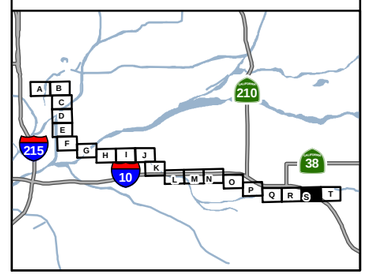

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 S

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RPRP Action Area

Footprint

- Permanent Impacts
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Vegetation Community

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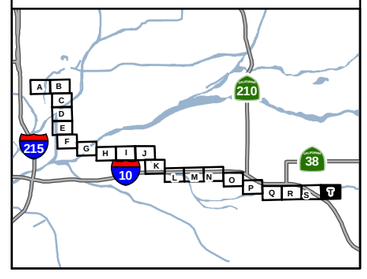

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Impacts on Vegetation Communities (Preferred Project)

Figure 5 T

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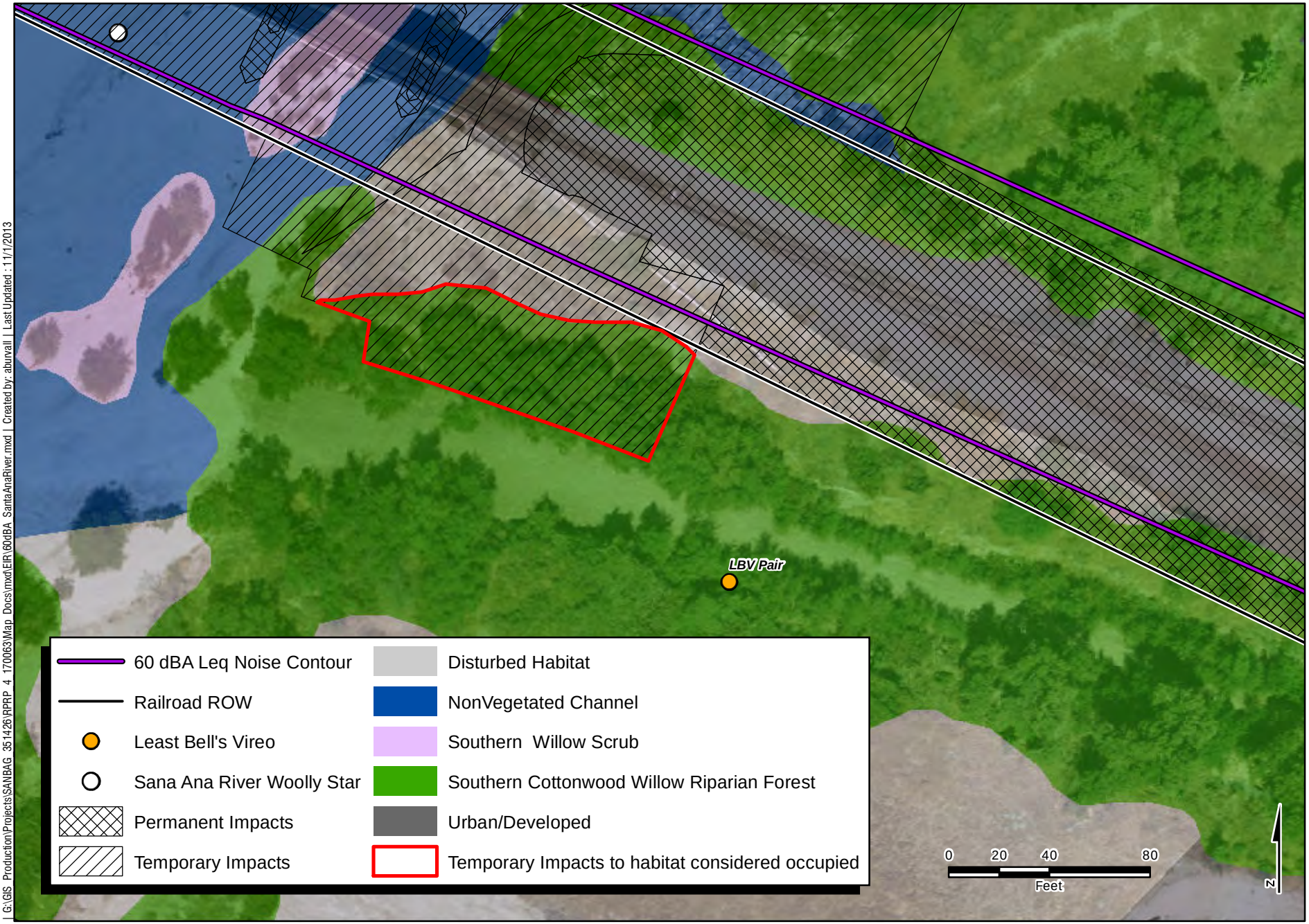

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Figure 6

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APPENDIX D

Site Photographs

APPENDIX D

Site Photographs

Photograph 1. Representative view of the disturbed habitat along the ROW.

Photograph 2. View of Twin Creek looking to the southwest.
Soil pit #3 is on north side of creek and soil pit #4 is on the south side.
The soil pit areas are disturbed wetland.

Photograph 3. View of eucalyptus woodland habitat along the southwestern side of the Santa Ana River.

Photograph 4. Mission Zanja Creek flowing into Santa Ana River. Disturbed habitat in the foreground and southern willow scrub habitat in the background. Northerly view.

Photograph 5. Northerly view of Warm Creek a non-vegetated channel.

Photograph 6. View of oak woodland looking north.

Photograph 7. Southern willow scrub looking easterly.

Photograph 8. Representative view of urban/developed habitat.

Photograph 9. Southeast side overflow of Santa Ana River. Northerly view.

Photograph 10. Northerly view of Mission Zanja Creek.

Photograph 11. Mill Creek Zanja. Northwesterly view.

Photograph 12. Non-jurisdictional feature.

Photograph 13. Soil pit #1.

Photograph 14. Overview of soil pit #1 location.

Photograph 15. Overview of soil pit #2 location.

Photograph 16. Manufactured earthen berm separating the storm water runoff (soil pits #1 and #2) from Zanja Channel.

Photograph 17. North side of Twin Creek. Location of soil pit #3.

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APPENDIX E

Least Bell's Vireo Report

SANBAG
Redlands Passenger Rail Project
Least Bell's Vireo Survey Report

October 2012

Prepared for

San Bernardino Associated Governments
1170 W. 3rd Street, 2nd Floor
San Bernardino, California 92410

Prepared by

HDR Engineering, Inc.
8690 Balboa Avenue, Suite 200
San Diego, California 92123

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Appendices

Appendix A Observed Avian Species
Appendix B Site Photographs

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1.0 EXECUTIVE SUMMARY

This report details the results of a focused least Bell's vireo (*Vireo bellii pusillus;* LBV) survey for the proposed Redlands Passenger Rail Project (project). The project would include the development of new railroad infrastructure along an approximate nine mile section rail corridor owned by SANBAG and would include the development of five stations consisting of boarding platforms with supporting amenities, parking and pedestrian access improvements, train layover/storage facilities with storage tracks, a vehicle wash, ancillary facilities, grading and drainage improvements, railroad signal improvements, replacement or improvements to five existing bridge structures and approximately two dozen at-grade highway-rail crossings.

2.0 SURVEY AND SITE DESCRIPTION

The survey area is located in the City of San Bernardino and within the San Bernardino South U.S. Geological Survey 7.5-minute quadrangle (Figures 1 and 2). The RPRP would involve the implementation rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. Figure 1 depicts the project location. A portion of the project area occurs within the Santa Ana River (SAR), which supports suitable nesting and foraging habitat for the federally endangered LBV. In summary, three non-mated males and one nested pair of LBV were observed within the survey area from April 16, 2012-July 5, 2012 (Figure 3).

3.0 PURPOSE OF STUDY

The purpose of the study is to determine if suitable habitat for LBV exists within the survey area, and if so, to conduct a presence/absence survey for the state and federally endangered LBV per the United States Fish and Wildlife Service (USFWS) protocol (USFWS 2001).

4.0 LEAST BELL'S VIREO STATUS AND BIOLOGY

The LBV is a federally and state of California listed endangered species. The species is small, averaging about 4.75 inches in length, with faint wing bars, an eye-ring or stripe, and is typically grey to light olive in color. A distinguishing characteristic of LBV is the flicking and bobbing of their relatively long tails (Sibley 2000). The species has a life span of up to seven years (USFWS 1998).

Historically the species was known to breed from as far south as San Fernando, Baja California to as far north as Tehama County in northern California (CDFG 2006). Currently, the LBV breeding range has been restricted to Southern California, with large breeding populations in Riverside and San Diego Counties. Small breeding populations are found in Santa Barbara and Ventura counties, and in northern Baja California, Mexico (CDFG 2006).

LBV generally occur in southern arroyo willow riparian forest and southern willow scrub habitats during the breeding season. Plant species associated with these habitats are Fremont cottonwood (*Populus fremontii*), arroyo willow (*Salix lasiolepis*), black willow (*Salix gooddingii*), willow shrubs (*Salix spp*.), and mulefat (*Baccharis salicifolia*). LBV winter in southern Baja California, Mexico, where they will occupy a variety of habitats including: mesquite scrub within arroyos, palm groves, and hedgerows bordering agricultural and residential areas (Kus 2002).

LBV generally conceal their nests in dense foliage and within one meter of the ground. Early to mid-successional riparian habitat is typically used for nesting by LBV because it supports the dense shrub cover required for nest concealment as well as a structurally diverse canopy for foraging (Kus 2002). LBV nests are typically constructed out of small pieces of bark, leaf fragments, pieces of soft plants, spider webs and other materials. LBV prefer to forage in lower to mid level canopy heights for bugs, beetles, moths, grasshoppers, and caterpillars.

The major threat to LBV populations has been nest parasitism by the brown-headed cowbird (BHC) (*Molothrus ater*) and loss of habitat due to animal grazing and human development. Due to aggressive conservation efforts, the status of the LBV is stable to increasing (CDFG 2006).

5.0 SURVEY METHODS AND LIMITATIONS

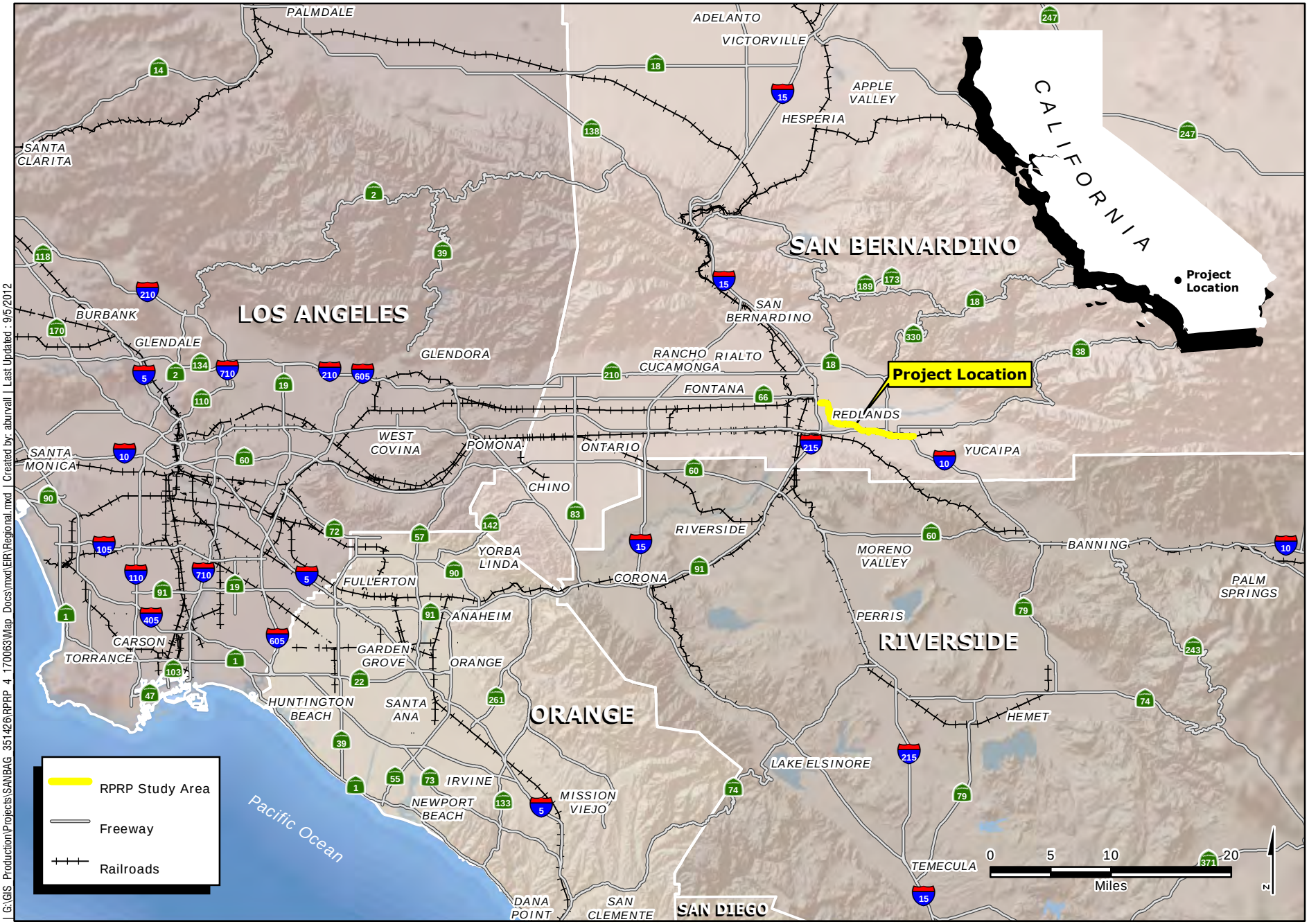
5.1 HABITAT ASSESSMENT

Prior to initiating protocol presence/absence surveys, vegetation communities within the survey area were assessed for suitability for LBV. Fourteen distinct vegetation communities occur within the 533.88-acre survey area (Figure 3, Table 1). Of the 14, two communities support habitat suitable for LBV nesting and foraging (Southern Cottonwood Willow Riparian Forest [SCWRF], Southern Willow Scrub [SWS]).

Table 1. Existing Vegetation within the Project Survey Area

Vegetation Communities	Survey Area Acreage
Disturbed Habitat	24.54
Disturbed Wetland	0.02
Eucalyptus Woodland	2.78
Flat-top Buckwheat Scrub (disturbed)	0.91
Mulefat Scrub	0.04
Non-Jurisdictional Ditch	1.31
Non-Native Grassland	61.90
Non-Vegetated Channel	29.22
Oak Woodland	9.62
Orchard and Vineyards	5.28
Southern Cottonwood Willow Riparian Forest	8.27
Southern Willow Scrub	0.64
Tamarisk Scrub	0.47
Urban/Developed	388.88
Total	533.88

Southern Cottonwood Willow Riparian Forest (SCWRF) is generally a tall, open, broadleafed winter-deciduous riparian forests dominated by Fremont cottonwood (*Populus fremontii)* and several willow species (*Salix* spp). This habitat occurs in sub-irrigated and frequently overflowed lands along rivers and streams. The dominant species require moist, bare mineral soil for germination and establishment. The understory is generally vegetated by herbaceous and viney species such as sedges (*Carex* sp.), grape (*Vitis* sp.), and introduced wetland species. Within the survey area, southern cotton wood riparian (SCWRF) occurs primarily within the western portion of Mission Zanja Channel and within the SAR.



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HDR
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Regional Location Map

Figure 1

FTA/SANBAG | Redlands Passenger Rail Project | LBV

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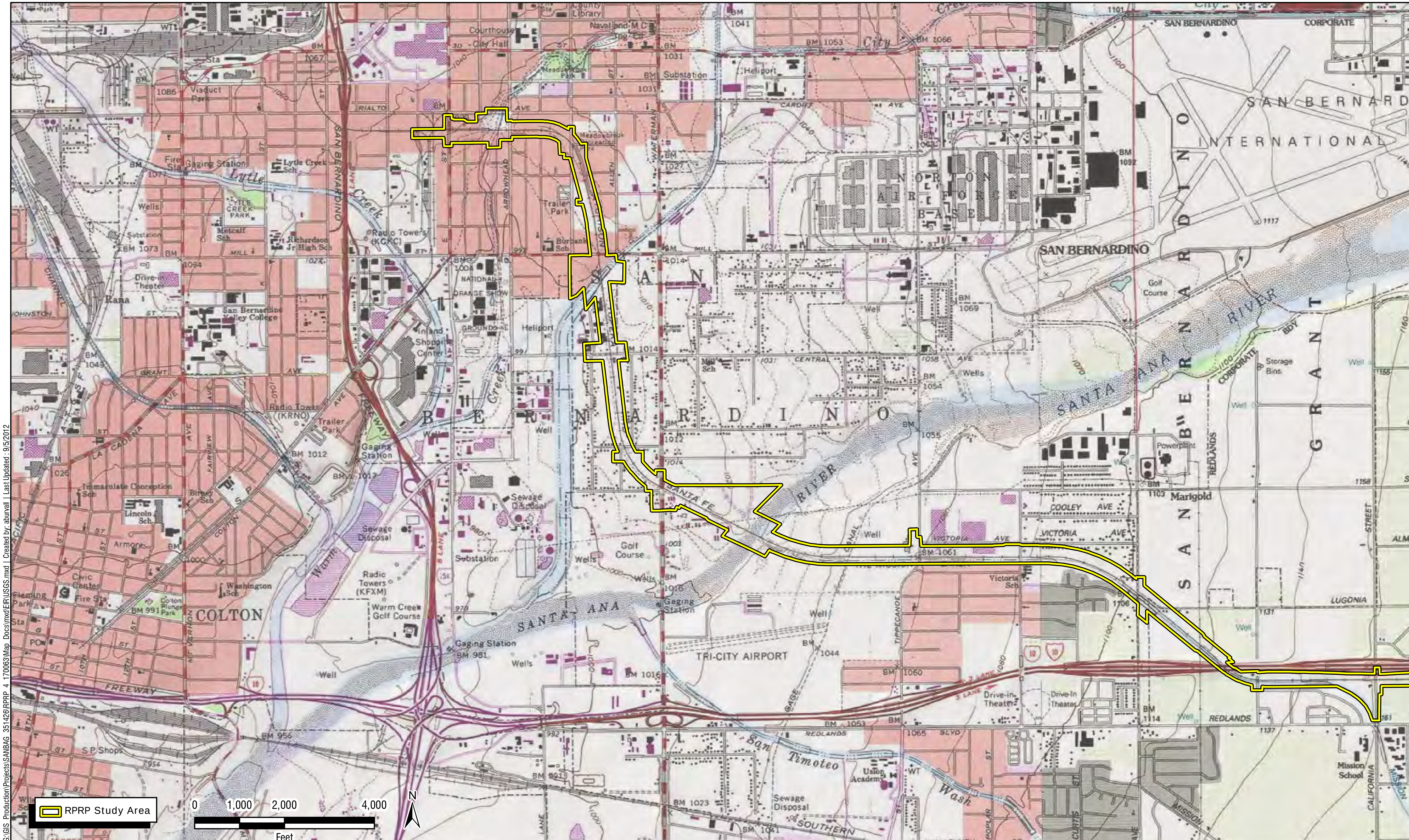

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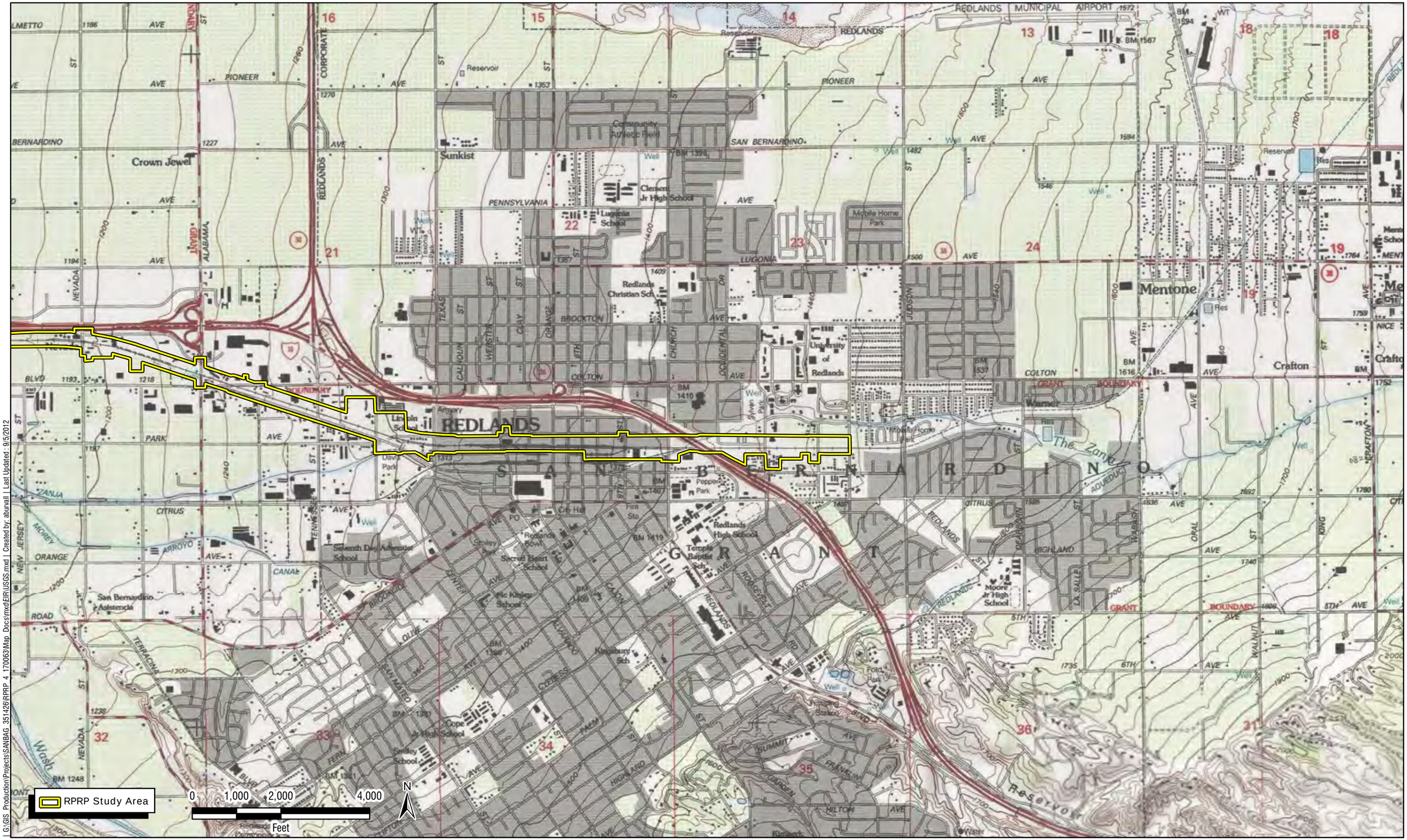
USGS Topographic Map

Figure 2a

FTA/SANBAG | Redlands Passenger Rail Project | LBV



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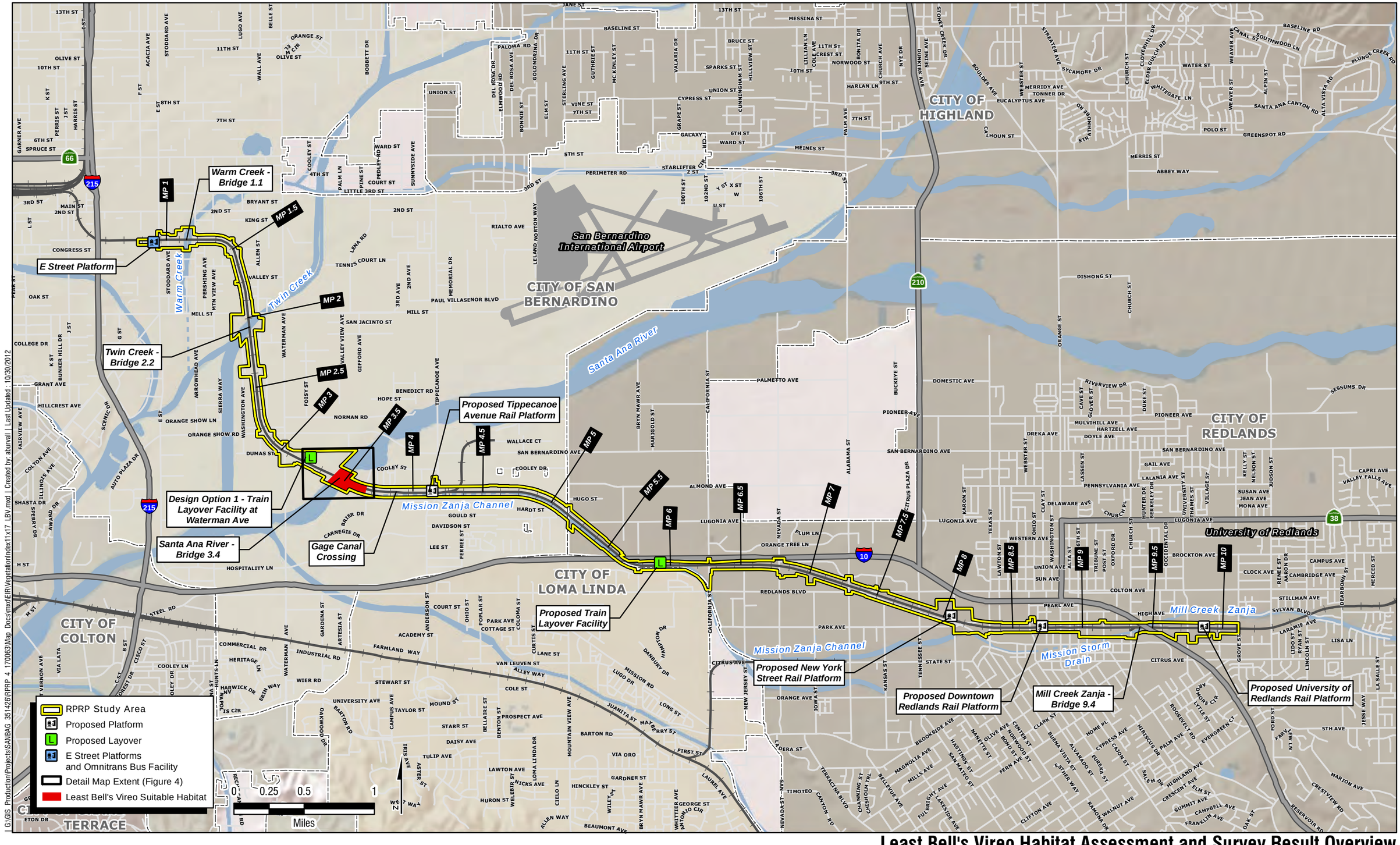
USGS Topographic Map

Figure 2b

FTA/SANBAG | Redlands Passenger Rail Project | LBV



Least Bell's Vireo Habitat Assessment and Survey Result Overview

Figure 3

FTA/SANBAG | Redlands Passenger Rail Project | LBV

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Southern willow scrub (SWS) generally consists of a dense thicket of various willow species (*Salix* spp.). This habitat occurs in loose, sandy alluvium near stream channels and is frequently flooded. The habitat is limited by the dense thicket of willows and frequent flooding which impacts the development of an understory. Within the survey area, SWS occurs as small patches within the SAR.

5.3 SURVEY METHODOLOGY

In accordance with the USFWS presence/absence survey protocols for the LBV (USFWS 2001), all appropriate riparian habitat located within the survey area was surveyed during each site visit. Within the nine-mile alignment, suitable habitat only occurs within the Santa Ana River (SAR) portion of the project. The survey was conducted by HDR biologists Allegra Simmons, Aaron Newton, and Glenn Lukos Associates (GLA) biologist Jeff Ahrens. Each of the eight focused survey visits were conducted at an interval of no less than 10 calendar days and between April10 and July 31. LBV were identified through visual and audible observations. Locations, activity, and number of individuals were noted during the site visits. In addition, all avian species observed were noted (Appendix A). All accessible portions of the survey area with appropriate habitat were surveyed on foot to allow for direct visual observation the habitat (Figure 3). Surveyors walked slowly and methodically during normal weather conditions conductive to bird activity (winds less then 15 mph, no rain and temperatures less then 95 F).

The protocol presence/absence surveys were conducted during morning hours (between 0530 and 1100 hours) under clear to morning overcast skies (0-80% cloud cover), with air temperatures between 59 and 87 degrees Fahrenheit, and with winds between 0 and 4 miles per hour (Table 2).

Table 2. Survey Dates, Times and Climatic Conditions

Surveyors	Survey Date	Times	Skies (% cloud cover)		Temperature		Winds (mph)
			Start	End	Start	End	
Allegra Simmons, Aaron Newton	4/16/2012	0820-1100	0	0	63°F	75°F	1-2
Allegra Simmons, Aaron Newton	4/27/2012	0730-1023	80	10	59°F	77°F	0-2
Allegra Simmons, Aaron Newton	5/08/2012	0756-1050	0	0	65°F	87°F	0-4
Jeff Ahrens	5/21/2012	0615-0950	0	0	65	82	0-1
Jeff Ahrens	6/01/2012	0600-0925	0	0	63	73	0-1
Jeff Ahrens	6/11/2012	0620-0945	0	0	63	70	1-2
Jeff Ahrens	6/25/2012	0530-0855	0	0	53	62	1-3
Jeff Ahrens	7/05/2012	0555-0900	20	20	59	70	1-2

6.0 SURVEY RESULTS

A diverse assemblage of 48 avian species was observed during the survey (Appendix A). These species are expected to occur within the urban and riparian habitat in the survey area. A common threat to LBV, brown-headed cowbirds (BHC) was not observed on site during the surveys. Other sensitive species observed during the surveys include the yellow warbler (*Setophaga petechia*), a California

Species of Concern, and an individual of Santa Ana River woolly-star (*Eriastrum densifolium spp. sanctorum*), which is federally endangered (Figure 3).

The USFWS protocol surveys included eight survey sessions conducted between April 16, 2011 and July 5, 2012 (Table 2). During the surveys, three individual male LBV and one pair were detected. Of these, Table 3 is a summary of each survey session.

Table 3. LBV Observations

Survey Date	LBV Observed
4/16/2012	1
4/27/2012	2
5/08/2012	1
5/21/2012	0
6/01/2012	4
6/11/2012	3
6/25/2012	3
7/05/2012	3

The following is a summary of each survey session. LBV locations referenced below can be found on Figure 3b.

On **April 16, 2012**, a single male LBV (LBV 1) was detected vocalizing in the SCWARF along the northeastern portion of the SAR; the location of the vocalization was approximately 600 feet northeast of Bridge 3.4.

On **April 27, 2012**, two separate males were detected vocalizing repeatedly in different locations. The first single male LBV (LBV 1) was heard calling/observed at 0843 hours, approximately 800 feet north of Bridge 3.4, along the east side of the SAR in the SWS. The male was followed south for approximately 200 feet as he continued calling. It is likely this is the same male (LBV 1) observed on April 16, 2012.

The second single male LBV (LBV2) was detected vocalizing repeatedly approximately 500 feet south of Bridge 3.4 along the east bank of the SAR around 0930 hours. LBV 2 was observed using the SCWARF along the river banks and the upper floodplain area up to adjacent parking lot.

On **May 8, 2012**, one male LBV (LBV 1) was detected vocalizing approximately 800 feet north of Bridge 3.4 in the SAR along the northeast bank within the SWS. He was observed for a short period of time before he flew off and ceased calling. This is likely the same male that was observed on April 16 and 27, 2012.

On **May 21, 2012** no LBV were observed during the survey effort.

On **June 1, 2012**, four LBV were detected during surveying activities. The first LBV (LBV 1) was observed approximately 500 feet to the northeast of the project site and is in the same location/territory as initially observed on April 16, 2012. The second LBV (LBV 3) was observed approximately 400 feet to the southeast of the Bridge 3.4 within the SCWARF (Figure 3). The third

and fourth LBV detected was a pair (LBV Pair) exhibiting nesting behavior and was observed approximately 150 feet south of the railroad in the lower portion of Mission Zanja Creek and within the limits of the survey area.

On **June 11, 2012**, three LBV were detected. A male LBV (LBV 2) was detected approximately 600 feet south of the project site. The male arrived from the south and was noted as countering singing with another LBV (LBV 3), then returned to the south out of the LBV survey area. The other two observed LBV were in the same locations as previously observed LBV, one to the north in the SCWRF (LBV 1) and one to the south in the willow riparian forest (LBV 3).

On **June 25, 2012**, three LBV were observed separately in previously detected locations. The pair that was first detected on June 1, 2012 (LBV pair) was spotted in the same location/territory. The other LBV (LBV 3) was detected to the south in the same willow riparian forest.

On **July 5, 2012**, three LBV were detected in previously observed and documented locations. The first LBV (LBV 3) was observed 400 to the south of Bridge 3.4 and the second and third LBV observed was the breeding pair (LBV Pair) that was first observed on June 1, 2012.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Breeding and non-breeding LBV were documented within the portion of the survey area located in the SAR. Implementation of the proposed project would temporarily and permanently impact nesting and foraging habitat (SWS and SCWARF) for LBV. HDR recommends the following measures to minimize and/or avoid impacts to nesting and foraging LBV:

(1) Construction activities within or immediately adjacent to LBV habitat should occur outside of the breeding season for the species (February 15 – September 15).

(2) Should construction within the breeding season be unavoidable, a pre-construction nesting survey may be required.

(3) The federal Endangered Species Act (ESA) defines and lists *species* as "endangered" or "threatened" and provides regulatory protection for the listed species. The federal ESA provides a program for conservation and recovery of threatened and endangered species. It also ensures the conservation of designated critical habitat that the USFWS has determined is required for the survival and recovery of these listed species. Section 9 of the federal ESA prohibits the "Take" of species listed by USFWS as threatened or endangered. *Take* is defined as: "…to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." In recognition that *Take* cannot always be avoided, Section 10(a) of the federal ESA includes provisions for *Take* that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) permits (incidental take permits) may be issued if *Take* is incidental and does not jeopardize the survival and recovery of the species.

   Should *Take* of LBV be unavoidable as a result of project implementation, Section 10 consultation with USFWS may be required.

(4) The results identified in the survey report are generally considered valid for one year. Should implementation of the proposed project occur beyond this period, additional protocol-level surveys may be required by the wildlife agencies.

(5) Please note that mitigation would be established during consultation with the wildlife agencies.

8.0 REFERENCES

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U.S. Fish and Wildlife Service. 1998. Draft recovery plan for the least Bell's vireo. U.S. Fish and Wildlife Service, Portland, OR. 139p.

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APPENDIX A
Observed Avian Species

Appendix A
Inventory of Avian Species Observed

Common Name	Scientific Name	Status
Ciconiiformes		
Ardeidae		
Green Heron	*Butorides virescens*	-
Galliformes		
Odontophoridae		
California Quail	*Callipepla californica*	-
Falconiformes		
Cathartidae		
Turkey Vulture	*Cathartes aura*	-
Accipitrinae		
Cooper's Hawk	*Accipiter cooperii*	-
Red-tailed Hawk	*Buteo jamaicensis*	-
Charadriiformes		
Charadriiae		
Killdeer	*Charadrius vociferus*	-
Columbiformes		
Columbidae		
Rock pigeon	*Columbia livia*	-
Eurasian collared dove	*Streptopelia decaocto*	-
Mourning Dove	*Zenaida macroura*	-
Apodiformes		
Trochilidae		
Allen's hummingbird	*Selasphorus sasin*	-
Anna's Hummingbird	*Calypte anna*	-
Black-chinned hummingbird	*Archilochus alexandri*	-
Piciformes		
Picidae		
Northern Flicker	*Colaptes auratus*	-
Nuttall's Woodpecker	*Picoides nuttallii*	-
Passeriformes		
Ptilogonatidae		
Phainopepla	*Phainopepla nitens*	-
Tyrannidae		
Pacific-slope Flycatcher	*Empidonax difficili*	-
Ash-throated Flycatcher	*Myiarchus cinerascens*	-
Black Phoebe	*Sayornis nigricans*	-
Say's phoebe	*Sayornis saya*	-
Western Kingbird	*Tyrannus verticalis*	-
Cassin's kingbird	*Tyrannus vociferans*	-

Common Name	Scientific Name	Status
Vireonidae		
Least Bell's Vireo	*Vireo bellii pusillus*	FE
Warbling Vireo	*Vireo gilvus*	-
Corvidae		
American crow	*Corvus brachyrhynchos*	-
Common Raven	*Corvus corax*	-
Hirundinidae		
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	-
Barn swallow	*Hirundo rustica*	-
Aegithalidae		
Bushtit	*Psaltriparus minimus*	-
Troglodytidae		
Bewick's Wren	*Thryomanes bewickii*	-
House Wren	*Troglodytes aedon*	-
Regulidae		
Ruby-crowned Kinglet	*Regulus calendula*	-
Timaliidae		
Wrentit	*Chamaea fasciata*	-
Mimidae		
Northern mockingbird	*Mimus polyglottos*	-
Sturnidae		
European Starling	*Sturnus vulgaris*	-
Parulidae		
Yellow Warbler	*Dendroica petechia*	SSC
Yellow-rumped Warbler	*Dendroica coronata*	-
Common Yellowthroat	*Geothlypis trichas*	-
Orange-crowned Warbler	*Oreothlypis celata*	-
Wilson's Warbler	*Wilsonia pusilla*	-
Emberizidae		
Song Sparrow	*Melospiza melodia*	-
California Towhee	*Melozone crissalis*	-
Spotted Towhee	*Pipilo maculatus*	-
Cardinalidae		
Black-headed Grosbeak	*Pheucticus melanocephalus*	-
Western tanager	*Piranga ludoviciana*	-
Icteridae		
Bullock's oriole	*Icterus bullockii*	-
Hooded Oriole	*Icterus cucullatus*	-
Fringillidae		
Carduelinae		
House Finch	*Carpodacus mexicanus*	-
Lesser goldfinch	*Spinus psaltria*	-

SSC = State Species of Concern, FE = Federally Endangered, FT = Federally Threatened

APPENDIX B
Site Photographs

APPENDIX B
Site Photographs

Photograph 1. View of SWS within the Mission Zanja Creek. View looking east.

Photograph 2. View looking north of the project site at the SWS along the eastern side of the Santa Ana River.

Photograph 3. The SCWRF in the Mission Zanja Creek from the ROW. View looking to the east.

Photograph 4. The SCWRF in the Mission Zanja Creek from the ROW. View looking to the southwest towards the Santa Ana River.

APPENDIX F

Southwest Willow Flycatcher Report

GLENN LUKOS ASSOCIATES
Regulatory Services

August 13, 2012

Susie Tharratt
U.S. Fish and Wildlife Service
6010 Hidden Valley Road
Carlsbad, California 92011

SUBJECT: Submittal of Report for the Southwestern Willow Flycatcher at the Redlands Passenger Rail Project Located in the City of Redlands; San Bernardino County, California

Dear Ms. Tharratt:

This letter report summarizes the methodology and findings of surveys conducted for the federally-listed endangered southwestern willow flycatcher (*Empidonax traillii extimus*) ("SWIFL") conducted by Glenn Lukos Associates, Inc. (GLA) for the above-mentioned site in San Bernardino County, California. GLA was retained by HDR Engineering, Inc.to determine the presence or absence of the southwestern willow flycatcher at the property (hereinafter referred to as the "Project Site").

INTRODUCTION

The SWIFL is a small, migratory songbird, which inhabits riparian habitats throughout southern California and is one of four subspecies of willow flycatcher (WIFL) currently recognized. It was officially designated as a state-endangered species on January 2, 1991 and federally designated as endangered on March 29, 1995. The SWIFL measures about 5.75 inches (15 cm) in length, and weighs only about 0.4 ounces (12 g). Overall, it is roughly the size of a small sparrow. Both sexes look alike. Its appearance is overall greenish or brownish gray above, with a white throat that contrasts with a pale olive breast. The belly is pale yellow. Two white wing bars are visible, but the eye ring is faint or absent. The upper mandible is dark, and the lower mandible light (USGS). It closely resembles the other races of willow flycatcher, and several other species of the *Empidonax* genus, particularly the closely related Alder flycatcher (*Empidonax alnorum*). The SWIFL is generally the palest in coloration of the WIFL subspecies (Unitt 1987), but this difference in color is extremely subtle and is not recommended as a reliable way to distinguish between the subspecies in the field (Hubbard 1999).

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The SWIFL breeds in relatively dense riparian habitats in all or parts of seven southwestern states, from near sea level to over 2,000 m (6,100 ft). More specifically, the SWIFL breeds in riparian habitats along rivers, streams, or other wetlands, where relatively dense growths of trees and shrubs are established, near or adjacent to surface water or underlain by saturated soil (McCabe 1991). Common tree and shrub species comprising nesting habitat include willow (*Salix* sp.), boxelder (*Acer negundo*), tamarisk (*Tamarix ramosissima*), and Russian olive (*Eleagnus angustifolia*) (USFWS 2002).

Habitat characteristics such as plant species composition, size and shape of habitat patch, canopy structure, vegetation height, and vegetation density vary across the subspecies range. However, regardless of the plant species composition or height, occupied sites usually consist of dense vegetation in the patch interior, or an aggregate of dense patches interspersed with openings. In most cases this dense vegetation occurs within the first 3-4 m (10-13 ft) above ground. These dense patches are often interspersed with small openings, open water or marsh, or shorter/sparser vegetation creating a mosaic that is not uniformly dense (USFWS 2002). The SWIFL winters in Mexico and Central America and northern South America (Phillips 1948, Gorsiki 1969, McCabe 1991, Koronkiewicz et al. 1998, Unitt 1999).

SITE LOCATION AND DESCRIPTION

The Project Site is located in the City of Redlands, San Bernardino County, California and can be found on the U.S. Geological Survey 7.5' San Bernardino South quadrangle [dated 1967 and photorevised in 1980]) in unsectioned areas of Township 1 South, Range 4 West [Exhibits 1 and 2 – Regional and Vicinity Map]. The WIFL surveys were conducted within a portion of the Project Site located north of South Waterman Avenue and south of East Orange Show Road.

The survey area included the Santa Ana River, approximately 91 meters (300 feet) on both sides of the railroad bridge crossing and also included Zanja Channel, which parallels the railroad corridor from the confluence of the Santa Ana River east approximately 0.65 kilometers (0.4 miles) to where the riparian vegetation terminates at a concrete spillway [Exhibit 3 – Survey Area Map]. The Santa Ana River within the survey area is approximately 170 meters wide (558 feet) and consists primarily of fine sandy substrate and includes areas supporting vegetated sandy terraces and islands. Zanja Channel is an un-improved trapezoidal earthen channel that is approximately 36 meters (118 feet) in width. Elevation of the Project Site is approximately 314 meters (1030 feet) above mean sea level. A detailed description of the riparian habitat surveyed is provided below.

VEGETATION

The riparian habitat surveyed within the Santa Ana River and Zanja Channel is comprised primarily of southern cottonwood willow riparian forest and southern willow scrub. In general, the riparian habitat is mature and consists of a sandy substrate. Portions of the Santa Ana River are unvegetated or support newer growth caused by seasonal scouring. Surface water or saturated soils were not detected within the Santa Ana River. The western half of Zanja channel supported dense riparian willow vegetation within a narrow sandy streambed. The eastern half of the channel was more open, supporting more cottonwoods than willows. A small central portion of Zanja channel exhibited surface water. The height of the riparian vegetation within the survey area ranged between 4.6 meters (15 feet) to 16.7 meters (55 feet), but averaged between 10.7 meters (30 feet) to 12.2 meters (40 feet).

Dominant riparian vegetation within the survey area includes arroyo willow (*Salix lasiolepis*), Freemont's cottonwood (*Populus fremontii* ssp. *fremontii*), red willow (*Salix laevigta*), Gooding's willow (*Salix goodingii*), sandbar willow (*Salix exigua*), yellow willow (*Salix lasiandra* ssp. *lasiandra*), and mule fat (*Baccharis salicifolia*).

Additional plants detected on site include western ragweed (*Ambrosia psilostachya*), mugwart (*Artemisia douglasiana*), common sunflower (*Helianthus annuus*), telegraph weed (*Heterotheca grandiflora*), prickly lettuce (*Lactuca serriola*), cocklebur (*Xanthium strumarium*), salt cedar (*Tamarix ramosissima*), wild grape (*Vitis girdiana*), California rose (*Rosa californica*), wild radish (*Raphanus sativus)*, annual yellow sweetclover (*Melilotus indicus*), white sweetclover (*Melilotus albus*), common sow-thistle (*Sonchus oleraceus*), Lamb's quarters (*Chenopodium album*), alkali heliotrope (*Heliotropium curassavicum*), Canadian horseweed (*Conyza canadensis*), black mustard (*Brassica nigra*), California buckwheat (*Eriogonum fasciculatum*), dwarf nettle (*Urtica urens*), cheeseweed (*Malva parviflorus*), Russian thistle (*Salsola tragus*), tocolote (*Centaurea melitensis*), blue gum (*Eucalyptus globulus*), shortpod mustard (*Hirschfeldia geniculata*), London rocket (*Sisymbrium irio*), chia (*Salvia coumbariae*), yerba santa (*Eriodictyon californicum*) and horehound (*Marrubium vulgare*).

METHODOLOGY

Protocol surveys for the SWIFL were performed in all areas of suitable habitat on site. Surveys were conducted in accordance with the 2010 U.S. Fish and Wildlife Service (USFWS) guidelines[1], which stipulate that for Projects, five surveys (divided into three survey periods)

[1] *A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher*, prepared by the USGS.

shall be conducted in all areas of suitable habitat. One survey was conducted during the first survey period (May 15 to May 31). Two surveys were conducted during the second survey period (June 1 to June 24), and two surveys were conducted during the third survey period (June 25 to July 17).

GLA biologist Jeff Ahrens (TE052159-3) conducted the protocol surveys on May 21, June 1, June 11, June 25, and July 5, 2012. All surveys were conducted during the morning hours and were completed before 10:30 A.M. No surveys were conducted during extreme weather conditions (i.e., winds exceeding 15 miles per hour, rain, or temperatures in excess of 95°F). All areas of suitable habitat were surveyed on foot by walking slowly and methodically. Taped vocalizations primarily using the willow flycatcher's main contact call "fitz-bew" was used to elicit responses from WIFLs that might be present on site. The detection of WIFLs on site was based on both sight and call.

Weather conditions during the surveys were conducive to a high level of bird activity. Temperatures ranged from approximately 53 ° to 82° Fahrenheit. Wind speeds ranged from one to three miles per hour (mph) during the surveys. Table 1 summarizes the survey dates and weather conditions recorded at the Project site.

Table 1. Summary of Survey Dates and Weather Conditions for the Redlands Passenger Rail Project

Date	Start Time	End Time	Permitted Surveyor	Temp °F, (start/end)	Wind Speed (MPH) (start/end)	% Cloud Cover (start/end)
5/21/12	0615	0950	JA	65 - 82	1 - 1	Clear
6/01/12	0600	0925	JA	63 - 73	1 - 1	Clear
6/11/12	0620	0945	JA	63 - 70	2 - 1	Clear
6/25/12	0530	0855	JA	53 - 62	1 - 3	Clear
7/5/12	0555	0900	JA	59 - 70	2 - 2	20 - 20

JA – Jeff Ahrens

RESULTS

No WIFLs were detected within the Project Site during the focused surveys. One least Bell's vireo (*Vireo bellii pusillus*) (LBV) pair exhibiting nesting behavior was detected within Zanja Channel near the confluence with the Santa Ana River. In addition, three unmated LBVs were detected outside of the survey area. LBV 1 was an unmated male that was detected on June 1, 11, 25, and July 5, 2012) approximately 132 meters (433 feet) south of the railroad crossing. LBV 2 was presumed to be an unmated male that was detected on June 1 and June 11, 2012

approximately 162 meters (531 feet) north of the railroad crossing. LBV 3 was a male that was observed briefly counter singing with LBV 1 on June 11, 2012 and proceeded to fly south and was not detected again. LBV 3 was approximately 170 meters (559 feet) south of the railroad crossing.

One individual Santa Ana River wooly star (*Eriastrum densifolium sanctorum*) was detected on June 11, 2012 within the Santa Ana River, immediately south of the railroad crossing. Other sensitive species detected within or close proximity to the Project Site include the yellow warbler (*Setophaga petechia*). Brown-headed cowbirds (*Molothrus ater*) were not detected during the focused surveys.

Exhibits 3 and 4 depict the survey area, LBV (and dates detected) and Santa Ana River wooly star locations on aerial and topographic maps, respectively. Data sheets are included at the end of the report. A compendium listing all avian species detected during the focused surveys is included at the end of the report.

If you have any questions regarding the methodology or findings of this report, please contact me at (949) 837-0404, ext 40.

I certify that the information in this survey report and attached exhibits fully and accurately represents my work.

GLENN LUKOS ASSOCIATES, INC.

Jeff Ahrens — TE 052159-3 — 8/13/12

Jeff Ahrens, Biologist — Permit # — Date

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APPENDIX A

AVIAN COMPENDIUM

The avian compendium lists bird species identified on the Site.

* = non-native species

ODONTOPHORIDAE	**Quails and Bobwhites**
Callipepla californica	California Quail
ARDEIDADE	**Herons and Egrets**
Butorides virescens	green heron
CATHARTIDAE	**New World Vultures**
Cathartes aura	turkey vulture
ACCIPITERIDAE	**Hawks, Old World Vultures and Harriers**
Accipiter cooperii	Cooper's hawk
Buteo jamaicensis	red-tailed hawk
CHARADRIIDAE	**Plovers And Relatives**
Charadrius vociferus	killdeer
COLUMBIDAE	**Pigeons and Doves**
* *Columbia livia*	rock pigeon
* *Streptopelia decaocto*	Eurasian collared dove
Zenaida macroura	mourning dove
TROCHILIDAE	**Hummingbirds**
Archilochus alexandri	black-chinned hummingbird
Calypte anna	Anna's hummingbird
Selasphorus sasin	Allen's hummingbird
PICIDAE	**Woodpeckers and Wrynecks**
Colaptes auratus	northern flicker
Picoides nuttallii	Nuttall's woodpecker
TYRANNIDAE	**Tyrant Flycatchers**
Empidonax difficilis	Pacific-slope flycatcher
Myiarchus cinerascens	ash-throated flycatcher
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Tyrannus vociferans	Cassin's kingbird

VIREONIDAE		**Vireos**
	Vireo bellii puusillus	least Bell's vireo
CORVIDAE		**Jays, Magpies and Crows**
	Corvus brachyrhynchos	American crow
	Corvus corax	common raven
HIRUNDINIDAE		**Swallows**
	Stelgidopteryx serripennis	northern rough-winged swallow
	Hirundo rustica	barn swallow
AEGITHALIDAE		**Bushtit**
	Psaltriparus minimus	bushtit
TROGLODYTIDAE		**Wrens**
	Thryomanes bewickii	Bewick's wren
	Troglodytes aedon	house wren
MIMIDAE		**Mockingbirds and Thrashers**
	Mimus polyglottos	northern mockingbird
PTILOGONATIDAE		**Silky-flycatchers**
	Phainopepla nitens	phainopepla
STURNIDAE		**Starlings and Allies**
*	*Sturnus vulgaris*	European starling
PARULIDAE		**Wood Warblers and Relatives**
	Geothlypis trichas	common yellowthroat
	Oreothlypis celata	orange-crowned warbler
	Setophaga petechia	yellow warbler
EMBERIZIDA		**Emberizines**
	Melospiza melodia	song sparrow
	Melozone crissalis	California towhee
	Pipilo maculates	spotted towhee
CARDINALIDAE		**Cardinals, Grosbeaks, and Allies**
	Pheucticus melanocephalus	black-headed grosbeak
	Piranga ludoviciana	western tanager
ICTERIDAE		**Blackbirds, Orioles, and Allies**
	Icterus bullockii	Bullock's oriole

Icterus cucullatus	hooded oriole
FRINGILLIDAE	**Finches**
Spinus psaltria	lesser goldfinch
Carpodacus mexicanus	house finch

Willow Flycatcher (WIFL) Survey and Detection Form (revised April, 2010)

Site Name: Redlands Passenger Rail Project State: CA County: San Bernardino

USGS Quad Name: San Bernardino South Elevation: ~308 (meters)

Creek, River, or Lake Name: Santa Ana River & Zanja Channel

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? *Yes* X *No* ____

Survey Coordinates: Start: E 474843.36 N 3770435.32 UTM Datum: 83 (See instructions)

Stop: E 475531.89 N 3770325.68 UTM Zone: 11

If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.

Fill in additional site information on back of this page*

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding;-potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
							# Birds	Sex	UTM E	UTM N
Survey # 1 Observer(s): Jeff Ahrens	Date: 5/21/12 Start: 0615 Stop: 0950 Total hrs: 3hr, 35m	–	–	–	–	No WIFL Detected				
Survey # 2 Observer(s): Jeff Ahrens Jason Fitzgibbon	Date: 6/1/12 Start: 0600 Stop: 0925 Total hrs: 3hr, 25m	–	–	–	–	" "				
Survey # 3 Observer(s): Jeff Ahrens	Date: 6/11/12 Start: 0620 Stop: 0945 Total hrs: 3hr, 25m	–	–	–	–	" "				
Survey # 4 Observer(s): Jeff Ahrens	Date: 6/25/12 Start: 0530 Stop: 0855 Total hrs: 3hr, 25m	–	–	–	–	" "				
Survey # 5 Observer(s): Jeff Ahrens	Date: 7/5/12 Start: 0555 Stop: 0900 Total hrs: 3hr, 5m	–	–	–	–	" "				

Overall Site Summary	Total Adult Residents	Total Pairs	Total Territories	Total Nests
Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals. Total survey hrs: 16hr, 55m	0	0	0	0

Were any WIFLs color-banded? Yes ____ No ____

If yes, report color combination(s) in the comments section on back of form and report to USFWS.

Reporting Individual: Jeff Ahrens Date Report Completed: 8/13/12

US Fish & Wildlife Service Permit #: TE 052159-3 State Wildlife Agency Permit #: SCP 5820/Mau

Submit form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual Jeff Ahrens Phone #(949) 837-0404 ext 40

Affiliation Glenn Lukos Associates E-mail wildlife-biologist@yahoo.com

Site Name Redlands Passenger Rail Project Date report Completed 8/13/12

Was this site surveyed in a previous year? Yes___ No X Unknown___

Did you verify that this site name is consistent with that used in previous yrs? Yes X No _____ Not Applicable _____

If name is different, what name(s) was used in the past? —

If site was surveyed last year, did you survey the same general area this year? Yes N/A No _____ If no, summarize below.

Did you survey the same general area during each visit to this site this year? Yes X No _____ If no, summarize below.

Management Authority for Survey Area: Federal _____ Municipal/County X State _____ Tribal _____ Private _____

Name of Management Entity or Owner (e.g., Tonto National Forest) San Bernardino County Flood Control District / SANBAG

Length of area surveyed: ~ 0.85 (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

X Native broadleaf plants (entirely or almost entirely, > 90% native)

_____ Mixed native and exotic plants (mostly native, 50 - 90% native)

_____ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)

_____ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific name.

Salix lasiolepis, Salix laevigata, Populus fremontii, Baccharis Salicifolia, Salix exigua

Average height of canopy (Do not include a range): 30 feet (9.1) meters (meters)

Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections;
2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests;
3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features. Attach additional sheets if necessary.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

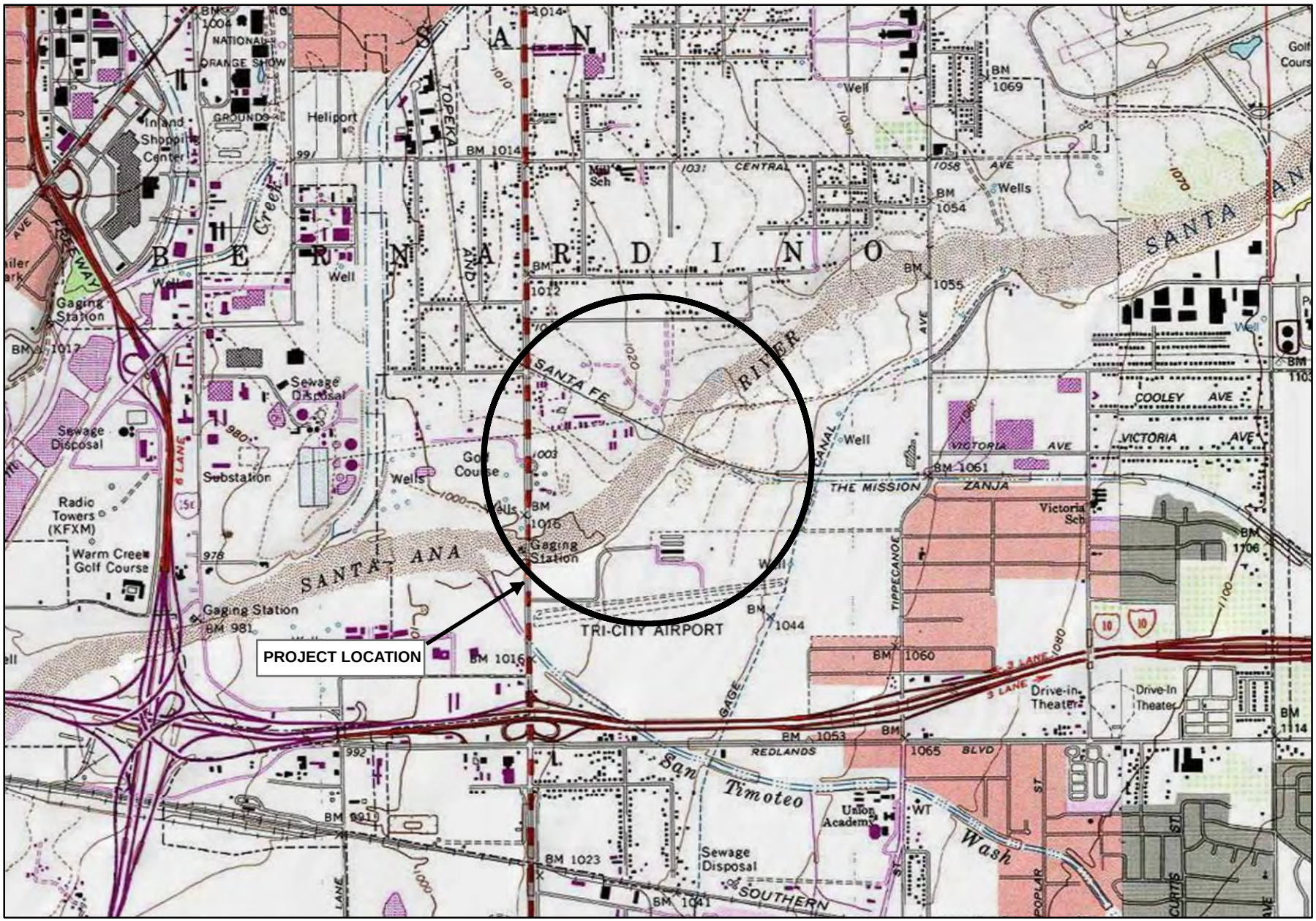
Source: ESRI World Street Map

REDLANDS PASSENGER RAIL PROJECT

Regional Map

GLENN LUKOS ASSOCIATES

Exhibit 1



Adapted from USGS San Bernardino South, CA quadrangle

N

0 1,000 2,000 4,000 Feet

REDLANDS PASSENGER RAIL PROJECT

Vicinity Map

GLENN LUKOS ASSOCIATES

Exhibit 2

Legend

- Limits of Survey Area
- Unmated LBV 1 (June 1, 11, 25 & July 5)
- Unmated LBV 2 (June 1 & 11)
- Unmated LBV 3 (June 11)
- LBV Pair (June 1, 25 & July 5)
- Santa Ana River Wooly Star

N

0 100 200 400
Feet

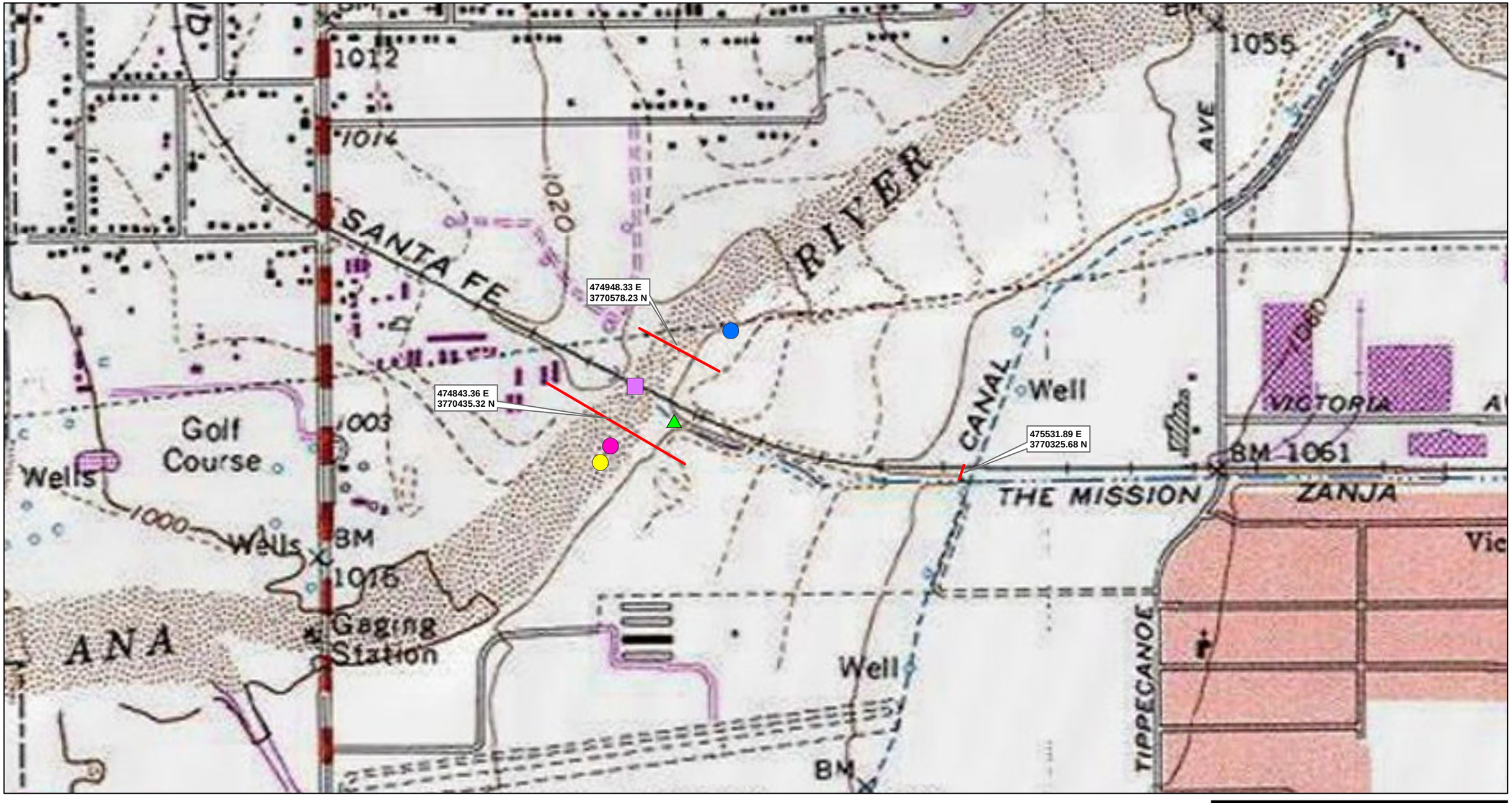
REDLANDS PASSENGER RAIL PROJECT

Southwestern Willow Flycatcher Survey Area Aerial Map

GLENN LUKOS ASSOCIATES

Exhibit 3

X:\0363-THE REST\1038-1WIFL\1038-1GIS\1038-1WIFL Aerial.mxd
July 20,2012



Legend

- Limits of Survey Area
- Unmated LBV 1 (June 1, 11, 25 & July 5)
- Unmated LBV 2 (June 1 & 11)
- Unmated LBV 3 (June 11)
- LBV Pair (June 1, 25 & July 5)
- Santa Ana River Wooly Star

N

0 300 600 1,200

Feet

REDLANDS PASSENGER RAIL PROJECT

Southwestern Willow Flycatcher Survey Area USGS Map

GLENN LUKOS ASSOCIATES

Exhibit 4

X:\0363-THE REST\1038-1WIFL\1038-1GIS\1038-1WIFL USGS.mxd

July 20,2012

Photograph 1: View looking south at the southern bank of the Santa Ana River at the confluence with Zanja Channel, from beneath the railroad bridge crossing.

Photograph 2: View looking southwest at the Santa Ana River, north (upstream) of the railroad bridge crossing.

Photograph 3: View looking east within Zanja Channel, near the confluence with the Santa Ana River.

Photograph 4: View looking east within Zanja Channel, approximately 300 meters east of the confluence with the Santa Ana River.

GLENN LUKOS ASSOCIATES

Exhibit 5

REDLANDS PASSENGER RAIL PROJECT

Site Photographs

APPENDIX G

San Bernardino Kangaroo Rat Report

San Bernardino Kangaroo Rat (*Dipodomys merriami parvus*) Habitat Assessment & Focused Survey Report for the Redlands Passenger Rail Project at the Santa Ana River Crossing

Located within an unsectioned portion of T1S, R4W, San Bernardino Base and Meridian, U.S. Geological Survey – San Bernardino South Quadrangle, City of San Bernardino, San Bernardino County, California

Prepared for:

HDR Engineering, Inc.
3230 El Camino Real Suite 200
Irvine, CA 92602
Contact Person: Ingrid Eich
Environmental Sciences Section Manager
Phone Number: (714) 730-2389

Prepared by:

Tom Dodson & Associates (TDA)
2150 North Arrowhead Avenue
San Bernardino, California 92405
Contact Person: Shay Lawrey
Phone Number: (909) 882-3612

Certification: I hereby certify that the statements furnished herein, and in the attached exhibits present data and information required for this Biological Survey to the best of my ability, and the facts, statements, and information presented are true and correct to the best of my knowledge and belief. This report was prepared in accordance with professional requirements and recommended protocols issued in (USFWS permit No. TE-094308-0)

Shay Lawrey, Ecologist/Regulatory Specialist

August, 2012

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TABLES

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Table 2. Survey dates, weather conditions, and moon phases
Table 3. Rodent species trapped

FIGURES *(located at the end of the document)*

Figure 1. Regional Location Map
Figure 2. Location Map
Figure 3. SBKR Critical Habitat within Subject Property
Figure 4. SBKR Survey Areas & Trapline Locations

PHOTOS *(located at the end of the document)*

1 Executive Summary

The San Bernardino County Associated Governments (SANBAG) proposes to construct the Redlands Passenger Rail Project (Project) which consists of rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino, at E Street and the University of Redlands in the eastern portion of the City of Redlands. Project construction includes demolition and replacement of the existing track, installation of new continuously welded rail on concrete ties and new ballast and sub-ballast sections throughout the rail corridor, and replacement or retrofitting of bridge crossings. Construction of the proposed Project would begin in 2015 and would proceed generally from the west of E Street to the SAR and similarly from the SAR east to Cook Street.

One bridge crossing to be replaced is the bridge structure at the Santa Ana River. A steel beam bridge will be constructed in replacement of the existing structure. Construction access/staging would occur from the north end of the western bank. If flow is present during construction, a temporary diversion of water may be required. The diversion may consist of a temporary bypass using a pipe, flume, excavated channel, or alternative method that temporarily reroutes water around the construction area. Work zone isolation at the SAR may be required through the installation of a cofferdam and/or construction work pads within the wet area.

The existing bridge and bridge piers would be removed prior to installation of new bridge piers and the proposed design would accommodate Santa River Trail Phase III along the western bank. A debris containment system will be installed under the bridge to catch any falling debris from the demolition activities. Construction at the SAR may involve limited dredging of material from the channel bed and/or excavation along the adjacent banks. These activities could also include the placement of fill including concrete and riprap. The new bridge will be up to 365 feet in length and will result in approximately 3.61 acres of temporary disturbance to the Santa Ana River channel bed/banks.

For this project HDR Engineering, Inc. (HDR) prepared a biological constraints analysis in October 2010. Based on that analysis, HDR determined that potentially suitable habitat for the San Bernardino kangaroo rat (*Dipodomys merriami parvus*) [SBKR] exists in the Project area. In 2012, HDR contracted Tom Dodson & Associates (TDA) to conduct a focused SBKR habitat assessment of the alignment and conduct follow-on trapping surveys if required. On May 8, 2012, TDA Biologist, Shay Lawrey conducted a habitat suitability assessment for SBKR along the entire alignment. Ms. Lawrey found that the area surrounding the SAR bridge crossing was the only area along the alignment suitable for SBKR. Since this area warranted follow-on surveys, Ms. Lawrey conducted a focused trapping survey between May 18 and May 23, 2012.

No SBKR were trapped over the course of the 5-night protocol survey. Therefore, SBKR are considered absent from the site. Due to the absence of SBKR on site, there is no risk of impacting SBKR directly by implementing this project. However, the project site is mapped within critical habitat (CH) designated by the U.S. Fish and Wildlife Service (USFWS) for SBKR. This project has a federal nexus via permitting and funding, therefore project-related impacts to CH must be addressed through formal consultation with the USFWS.

2 Location and Setting

The SBKR study area is located at the existing SAR rail road bridge crossing, north of Interstate 10 (I-10) freeway and Carnegie Drive, east of Waterman Avenue, south and southeast of Orange Show Road, and west of Tippecanoe Avenue in the City of San Bernardino, California (Figures 1-4). The study area can also be found on the U.S. Geological Survey (USGS) – San Bernardino South quadrangle, 7.5 Minute Series topographic map within an unsectioned portion of Township 1 South and Range 4 West.

The local area climate is semi-arid, with an average annual temperature of 67°F and a range from 25-110°F. The rainy season begins in November and continues through March, with the quantity and frequency of rain varying from year to year. The average annual rainfall is approximately 18.1 inches. The general vicinity of the subject property consists of open space, vacant land, Eucalyptus groves, and commercial uses.

3 Methods

3.1 Research

A literature review was also conducted to examine data gathered from various biological surveys previously conducted in the vicinity of the Project area. The literature review included a review of standard field guides and texts on sensitive and non-sensitive biological resources, as well as the following sources:

- *Natural Environmental Study (NES) prepared for the SART Phase III Project by Tom Dodson & Associates for the County of San Bernardino Regional Parks Department;*
- *San Bernardino Kangaroo Rat (Dipodomys merriami parvus)Presence/Absence Trapping Studies San Bernardino International Airport South Drainage Channel, San Bernardino, California prepared by Natural Resources Assessment, Inc., May 2012.*
- *Presence/Absence Trapping Studies for the San Bernardino Kangaroo Rat Santa Ana River Trails Phase III Tippecanoe Avenue to Orange Show Road City of San Bernardino, San Bernardino County, California Prepared by ENVIRA, March 2011.*
- *General Biological Assessment & Focused Survey Report for the Mountain View Avenue Extension & Widening Project prepared by Tom Dodson & Associates, 2008.*

3.2 SBKR Habitat Assessment

On May 8, 2012 TDA biologist, Shay Lawrey walked the alignment to visually assess the site conditions. During the site walk over, Ms. Lawrey looked for burrows, tail drags, tracks, and scat indicative of kangaroo rats. She also looked at the soil type and level of friability as well as habitat type and habitat structure.

3.3 SBKR Trapping Survey

Ms. Lawrey has a decade of experience with SBKR and is a biologist permitted (USFWS permit number TE 094308-0) by the USFWS to trap and handle SBKR. Ms. Lawrey conducted the focused live-trapping surveys between May 18 and May 23, 2012 according to protocols established for the SBKR. The protocol calls for five consecutive nights of trapping, when the animal is active above ground at night.

During the trapping session, a total of 100 traps (five trap lines consisting of 20 traps) were set. The trap lines consisted of 12-inch, Sherman live traps placed 10 meter apart. Traps were placed in suitable habitat areas, concentrating on locating traps in areas containing sandy soils, relatively free of debris and containing suitable vegetation. Areas with kangaroo rat/small mammal sign (scat, burrows, tail drags) were also targeted. Each trap was baited with a mixture of bird seed and rolled oats placed at the back of the traps. The traps were set at dusk each night and inspected once during the night and at dawn each morning. All animals were identified and released unharmed at the point of capture. Daily notes included weather conditions such as temperature, wind speed, cloud cover, precipitation and moon phase. Site characteristics such as soils, topography, the condition of the plant communities, and evidence of human use of the site were also noted.

4 Results

4.1 Research

Despite its location in the middle of a dense urban area, the SAR floodplain maintains considerable habitat value. In addition to the fundamental flood control and water-related functions of the SAR, this watercourse serves as a wildlife habitat linkage, corridor, and buffer in an urban context, linking habitats that are separated by development and providing wildlife dispersal and migration pathways. The floodplain also buffers plants and wildlife from surrounding human disturbance. For these and other reasons the habitats in SAR floodplain, and by default the SBKR study area, support a high level of natural resource diversity and richness. Table 1 below provides a list of sensitive species with a potential to occur in the vicinity of the SAR bridge crossing and information as to the presence of suitable habitat and/or CH.

Table 1: Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the Project Area at the SAR.

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
Plants					
bristly sedge	*Carex comosa*	CNPS 2.1	Marshes and swamps.	A	Grows along lake margins and wet places which are absent.
California bedstraw	*Galium californicum ssp. primum*	CNPS 1B	Chaparral, lower montane coniferous forest.	A	Grows in shade of trees and shrubs at the lower edge of the pine belt, in pine forest-chaparral ecotone.
California satintail	*Imperata brevifolia*	CNPS 2.1	Coastal scrub, chaparral, riparian scrub, mojavean scrub, meadows and seeps (alkali).	HP	Marginal habitat present. Species not found during survey.

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
Gambel's water cress	*Nasturtium gambelii*	FE/ST	Marshes and swamps.	A	Found in freshwater and brackish marshes at the margins of lakes and along streams, in or just above the water level.
Horn's milk-vetch	*Astragalus hornii var. hornii*	CNPS1B	Meadows and seeps, playas.	A	Grows along lake margins, alkaline sites which are absent.
Los Angeles sunflower	*Helianthus nuttallii ssp. parishii*	CNPS 1A	Marshes and swamps (coastal salt and freshwater). Historical from southern California.	A	Marsh/swamp habitat is not present.
marsh sandwort	*Arenaria paludicola*	FE/SE/ CNPS1B	Marshes and swamps.	A	No dense mats of typha, juncus, scirpus, etc. and no freshwater marsh.
mesa horkelia	*Horkelia cuneata ssp. puberula*	CNPS 1B	Chaparral, cismontane woodland, coastal scrub.	HP	Suitable habitat present but this species is not documented in the local vicinity of the Project and was not found during survey.
Nevin's barberry	*Berberis nevinii*	FE/SE	Chaparral, cismontane woodland, coastal scrub, riparian scrub.	A	Preferred steep, north-facing slopes are absent from site.
Parish's gooseberry	*Ribes divaricatum var. parishii*	CNPS 1A	Riparian woodland.	HP	Suitable habitat present. Species not observed during survey.
Parish's desert-thorn	*Lycium parishii*	CNPS 2.3	Coastal scrub, sonoran desert scrub.	HP	Suitable habitat present. Species not observed during survey.
Parish's bush-mallow	*Malacothamnus parishii*	CNPS 1A	Chaparral, coastal sage scrub.	HP	Suitable habitat present. Species not observed during survey.
Parry's spineflower	*Chorizanthe parryi var. parryi*	CNPS 1B	Coastal scrub, chaparral.	HP	Suitable habitat present. Species not observed during survey.
Plummer's mariposa-lily	*Calochortus plummerae*	CNPS 1B	Coastal scrub, chaparral, grassland, lower montane coniferous forest.	HP	Suitable habitat present. Species not observed during survey.
Pringle's monardella	*Monardella pringlei*	CNPS 1A	Coastal scrub.	HP	Suitable habitat present. Species not observed during

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
					survey.
Robinson's pepper-grass	*Lepidium virginicum var. robinsonii*	CNPS 1B	Chaparral, coastal scrub.	HP	Suitable habitat present. Species not observed during survey.
Salt Spring checkerbloom	*Sidalcea neomexicana*	CNPS 2.2	Alkali playas, brackish marshes, chaparral, coastal scrub, lower montane forest.	A	Species requires alkali springs and marshes which are absent from site.
salt marsh bird's-beak	*Cordylanthus maritimus ssp. maritimus*	FE/SE	Coastal salt marsh, coastal dunes.	A	Limited to the higher zones of the salt marsh habitat
San Bernardino aster	*Symphyotrichum defoliatum*	CNPS 1B	Meadows and seeps, marshes and swamps, coastal scrub, cismontane woodland, lower montane coniferous forest, grassland.	A	Requires vernally mesic grassland, ditches, streams and springs. Species not observed during SBKR survey or HDR focused plant surveys.
Santa Ana River woollystar	*Eriastrum densifolium ssp. sanctorum*	FE/SE	Coastal scrub, chaparral.	HP	Suitable habitat present. Species was observed approx. 150 meters outside of the Project boundaries.
slender-horned spineflower	*Dodecahema leptoceras*	FE/SE	Chaparral, coastal scrub (alluvial fan sage scrub).	HP	Suitable habitat present. Species documented in local vicinity, but not observed within study area during focused survey.
smooth tarplant	*Centromadia pungens ssp. laevis*	CNPS 1B	Valley and foothill grassland, chenopod scrub, meadows, playas, riparian woodland.	A	Grows in alkali meadow, alkali scrub which is absent.

Fish

arroyo chub	*Gila orcuttii*	SSC	Los Angeles basin south coastal streams.	A	Project abuts dry sandy river habitat. This species occurs in slow water stream sections with mud or sand bottoms.
Santa Ana sucker	*Catostomus santaanae*	FT	Endemic to Los Angeles basin south coastal streams.	A/ CH	Nearest location is d/s of La Cadena at the Rialto Drain. CH in Project alignment

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
Santa Ana speckled dace	*Rhinichthys osculus ssp. 3*	SSC	Headwaters of the Santa Ana and San Gabriel rivers. May be extirpated from the Los Angeles river system.	A	Requires permanent flowing streams with summer water temps of 17-20 c.

Reptiles & Amphibians

coast (San Diego) horned lizard	*Phrynosoma coronatum (blainvillii population)*	SSC	Inhabits coastal sage scrub and chaparral in arid and semi-arid climate conditions	HP	Species observed in vicinity.
northern red-diamond rattlesnake	*Crotalus ruber ruber*	SSC	Chaparral, woodland, grassland, & desert areas from coastal San Diego County to the eastern slopes of the mountains.	A	Occurs in rocky areas & dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.
orange-throated whiptail	*Aspidoscelis hyperythra*	SSC	Inhabits low-elevation coastal scrub, chaparral, and valley-foothill hardwood habitats.	HP	Prefers washes & other sandy areas with patches of brush & rocks. Species not observed during general biological surveys, but note that focused herpetological surveys were not conducted.
Sierra Madre yellow-legged frog	*Rana muscosa*	FE	Federal listing refers to populations in the San Gabriel, San Jacinto & San Bernardino mountains only.	A	Always encountered within a few feet of water.
silvery legless lizard	*Anniella pulchra pulchra*	SSC	Sandy or loose loamy soils under sparse vegetation.	A	Soil moisture is essential. They prefer soils with a high moisture content. Soils on site are dry.

Birds

burrowing owl	*Athene cunicularia*	SSC	Open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation.	HP	Suitable habitat present adjacent to trail alignment between Orange Show Road and California Street. Species or evidence

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
					such as feathers, castings , white wash or burrows were not observed during any of the field work including focused surveys conducted by HDR
coastal California gnatcatcher	*Polioptila californica californica*	FT	Obligate, permanent resident of coastal sage scrub below 2500 ft in southern California.	A	Species not observed in local vicinity for over 10 years. RAFSS is not the preferred habitat of this species.
least Bell's vireo	*Vireo bellii pusillus*	FE/SE	Summer resident of southern California in riparian habitat in vicinity of water or in dry river bottoms; below 2000 ft.	P	Observed during survey.
loggerhead shrike	*Lanius ludovicianus*	SSC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, & riparian woodlands, desert oases, scrub & washes.	P	Suitable habitat present and species observed.
southwestern willow flycatcher	*Empidonax traillii extimus*	FE/SE	Riparian woodlands in southern California.	P/CH	Portions of the Project are mapped within CH. Species is observed in Project area near Waterman Avenue.
yellow-breasted chat	*Icteria virens*	SSC	Summer resident; inhabits riparian thickets of willow & other brushy tangles near watercourses.	HP	Suitable habitat present. Species observed in local vicinity.
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	FC/SE	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	A	Nests in riparian jungles of willow. Habitat is not suitable for this species.
yellow warbler	*Dendroica petechia brewsteri*	SSC	Riparian plant associations. Prefers willows, cottonwoods, aspens, sycamores, & alders for nesting & foraging.	HP	Suitable habitat present. Species not seen during survey, but note focused avian surveys were not conducted.

Mammals

American badger	*Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous	HP	Suitable habitat present and species documented in vicinity.

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
			habitats, with friable soils.		
Los Angeles pocket mouse	*Perognathus longimembris brevinasus*	SSC	Lower elevation grasslands & coastal sage communities in and around the los Angeles basin.	P	Suitable habitat present and species documented in vicinity. Species not observed during survey.
northwestern San Diego pocket mouse	*Chaetodipus fallax fallax*	SSC	Coastal scrub, chaparral, grasslands, sagebrush, etc. In western San Diego co.	P	Suitable habitat present. Species observed in vicinity and found during survey.
pallid bat	*Antrozous pallidus*	SSC	Deserts, grasslands, shrublands, woodlands & forests. Most common in open, dry habitats with rocky areas for roosting.	A	No suitable roosting sites.
pocketed free-tailed bat	*Nyctinomops femorosaccus*	SSC	Variety of arid areas in southern California; pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert riparian	A.	Species found in rocky areas with high cliffs
San Bernardino kangaroo rat	*Dipodomys merriami parvus*	FE	Alluvial scrub vegetation on sandy loam substrates characteristic of alluvial fans and flood plains.	P/CH	Project area mapped within CH. Species was observed during survey and is documented in Project area.
Stephens' kangaroo rat	*Dipodomys stephensi*	FE/ST	Primarily annual & perennial grasslands, but also occurs in coastal scrub & sagebrush with sparse canopy cover.	A	Out of species range.
San Diego black-tailed jackrabbit	*Lepus californicus bennettii*	SSC	Open shrub / herbaceous & tree / herbaceous edges.	HP	Suitable habitat present. Species not observed during survey.
San Diego desert woodrat	*Neotoma lepida intermedia*	SSC	Coastal scrub of southern California from San Diego county to San Luis Obispo county.	P	Suitable habitat present. Species documented in vicinity and observed during survey.
southern grasshopper mouse	*Onychomys torridus ramona*	SSC	Desert areas, especially scrub habitats with friable soils for digging.	HP	Suitable habitat present. Species observed in vicinity.

Common Name	Scientific Name	Status	General Habitat	Habitat Present / Absent	Rationale
			Prefers low to moderate shrub cover.		
western mastiff bat	*Eumops perotis californicus*	SSC	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral etc.	A	No suitable habitat on site. Roosts in crevices in cliff faces, high buildings, & tunnels.
western yellow bat	*Lasiurus xanthinus*	SSC	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats.	HP	Suitable habitat present.

Insects

Delhi Sands flower-loving fly	*Rhaphiomidas terminatus abdominalis*	FE	Found only in areas of the Delhi sands formation in southwestern San Bernardino & northwestern Riverside counties.	A	Requires fine, sandy soils, often with wholly or partly consolidated dunes & sparse vegetation.

Coding of Terms: 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 CH unit, but does not necessarily mean that appropriate habitat is present.

Status: Federal Endangered (FE); Federal Threatened (FT); Federal Proposed (FP, FPE, FPT); Federal Candidate (FC), Federal Species of Concern (FSC); State Endangered (SE); State Threatened (ST); Fully Protected (FP); State Rare (SR); State Species of Special Concern (SSC); California Native Plant Society (CNPS) 1A- presumed extinct in California, 1B - Rare, Threatened or Endangered in California and elsewhere, 2 - Rare, Threatened or Endangered in California but more common elsewhere, 3 - Plants for which more information is needed, 4 - Plants with a limited distribution.

Of the species listed in the table above, four (4) sensitive small mammal species have a high potential for presence in the vicinity of the trapping survey area including the SBKR, San Diego pocket mouse, Los Angeles pocket mouse, and San Diego desert woodrat. Specific species background information for these four small mammals is provided for reference below. Please note that only the SBKR requires specific survey protocols to establish presence or absence. These specific survey protocols are required for areas where impacts may occur to the sensitive species or their occupied habitat. The remaining species are usually identified through casual observation while trapping for targeted species.

SBKR - The SBKR is one of several kangaroo rat species in its range. The Dulzura (*Dipodomys simulans*), the Pacific kangaroo rat (*Dipodomys agilis*) and the Stephens kangaroo rat (*Dipodomys stephensi*) occur in areas occupied by the San Bernardino kangaroo rat, but these other species have a wider habitat range. The habitat of the San Bernardino kangaroo rat is described as being confined to primary and secondary alluvial fan scrub habitats, with sandy soils deposited by fluvial (water) rather than aeolian (wind) processes. Burrows are dug in loose soil, usually near or beneath shrubs. The SBKR is one of three subspecies of the Merriam's kangaroo rat. The Merriam's

kangaroo rat is a widespread species that can be found from the inland valleys to the deserts. The subspecies known as the San Bernardino kangaroo rat, however, is confined to inland valley scrub communities, and more particularly, to scrub communities occurring along rivers, streams and drainage. Most of these drainages have been historically altered as a result of flood control efforts and the resulting increased use of river resources, including mining, off-road vehicle use and road and housing development. This increased use of river floodplain resources has resulted in a reduction in both the amount and quality of habitat available for the San Bernardino kangaroo rat. The past habitat losses and potential future losses prompted the emergency listing of the San Bernardino kangaroo rat as an endangered species (U.S. Fish and Wildlife Service, 1998a). Robust populations of SBKR are documented approximately 1 mile upstream of the study area. According to recent surveys conducted in the vicinity of the Project, SBKR have recently (2010 and 2012) been located approximately 0.25 mile upstream of the SAR crossing.

Northwestern San Diego Pocket Mouse - The northwestern San Diego pocket mouse prefers habitat similar to that preferred by the SBKR. The northwestern San Diego pocket mouse occurs in open, sandy areas in the valleys and foothills of southwestern California. The range of this species extends from Orange County to San Diego County, and includes Riverside and San Bernardino counties. This mouse is a California Species of Special Concern (CSC) whose historical range has been reduced by urban development and agriculture. CSC designation of species is based on a series of publications prepared by the CDFG on declining species of mammals, birds, fishes, and amphibians and reptiles. The publications were intended to focus attention on declining wildlife in California, species that are not currently listed but may merit listing under the California Endangered Species Act (CESA). Some of the species identified in these documents have been subsequently listed, or are provided protection under provisions in the California Endangered Species Act (CEQA). Others have remained on the CSC list, and have not been elevated to a greater status of protection. The reasons are many, including a lack of understanding on the specific numbers of individuals and populations, the habitats occupied by the species, and the threats to those habitats.

Los Angeles Pocket Mouse -The Los Angeles (LA) pocket mouse is one of two pocket mice found in this area of San Bernardino County. Both the Los Angeles pocket mouse and the San Diego pocket mouse occupy similar habitats, but the San Diego pocket mouse has a wider range extending south into San Diego County. The habitat of the Los Angeles pocket mouse is described as being confined to lower elevation grasslands and coast sage scrub habitats, in areas with soils composed of fine sands (Williams, 1986). The present known distribution of this species extends from Rancho Cucamonga east to Morongo Valley and south to the San Diego County border. LA pocket mouse forages in open ground and underneath shrubs. Pocket mice in general dig burrows in loose soil, although this has not been completely documented for this subspecies. The LA pocket mouse is listed as a California Species of Special Concern by the California Department of Fish and Game (CDFG).

San Diego Desert Woodrat -The desert woodrat is a relatively wide-ranging species extending along the coast of California from south of San Francisco through to the border with Baja California. This species also occurs in the Central Valley and the deserts of southern California and extends along the desert side of the Sierra Nevada into southeastern Oregon. The coastal race of the desert woodrat, the San Diego desert

woodrat, prefers scrub habitats such as coastal sage scrub, chaparral and alluvial fan sage scrub. It is more common in areas with rock piles and coarse sandy to rocky soils throughout coastal southern California. The range of this species extends from just south of Sacramento and the San Francisco area to the border with Baja California. The coastal subspecies of the widespread *Neotoma lepida* is listed as a CSC; its historical range has been impacted by the conversion of scrub habitats into residential, commercial and industrial use.

4.2 SBKR Habitat Assessment

After visually assessing the entire alignment and researching background information relative to SBKR occurrences, Ms. Lawrey determined that the only location in the Project alignment supporting suitable habitat for SBKR occurs at the existing SAR rail road bridge crossing. The soils here are very friable and consist of Psamments and fluvents (young alluvial deposits with little or no soil formation) and Soboba Stony Loamy sand. The type and structure of the habitat here are also consistent with SBKR occupation. Current surveys have been positive for SBKR 0.25 mile upstream of the existing SAR rail road bridge crossing between Orange Show Road and Tippecanoe Avenue. The rest of the Project alignment did not display any habitat characteristics or diagnostic sign indicative of potential SBKR occupation, nor did the records indicate SBKR presence. Therefore, the SBKR analysis area became focused at the existing SAR rail road bridge crossing.

4.2.1 Observed Habitats

Riversidean Alluvial Fan Sage Scrub RAFSS - Expansive blocks of RAFSS habitat exist within the Santa Ana River. RAFSS is a rare and sensitive plant community that is adapted to the harsh conditions of flooding. It grows on sandy, rocky alluvium deposited by streams that experience infrequent episodes of flooding. The dominant habitat type found within the SBKR study area includes RAFSS (Holland community code 32720). RAFSS is a Mediterranean shrubland community that dominates washes, floodplains, and alluvial fans in southern California. Because alluvial fan sage scrub is characterized by its diversity, it can also be described as an intermediate between chaparral and sage scrub habitats, in that all three vegetation communities share similar floral components. However, the distinguishing factor is that alluvial fan sage scrub undergoes periodic scouring from frequent flooding events, creating three seral stages; pioneer, intermediate, and mature.

The SBKR study area contains disturbed intermediate RAFSS. This habitat generally occurs between the active flood channels and terraces of the Santa Ana River and is subjected to infrequent flooding events. Species composition onsite includes scalebroom (*Lepidospartum squamatum*), California buckwheat, brittlebush, matchweed (*Gutierrezia californica*), broom matchweed (*Gutierrezia sarothrae*), telegraph weed (*Heterotheca grandiflora*), coastal goldenbush (*Isocoma menziesii*), interior goldenbush (*Ericameria linearifolia*), hairy yerba santa (*Eriodictyon trichocalyx*), California sagebrush (*Artemisia californica*), Coastal prickly pear (*Opuntia littoralis*), valley cholla (*Opuntia parryi*), shrubby butterweed (*Senecio flaccidus*), and Our Lord's candle (*Yucca whipplei*). Soils are mainly gravelly, coarse alluvium with approximately 50 percent vegetative cover.

California Buckwheat Alluvial Fan Association - The California Buckwheat Alluvial Fan Association (CBAFA) described by Gordon and White (1994) is a type of RAFSS in which California buckwheat is dominant. It is another alluvial scrub found adjacent to major floodplains and is found in the SBKR survey area. Species present onsite typical of this community included California buckwheat as a dominant species, as well as brittlebush, California matchweed, deerweed, and occasional hairy yerba santa and scalebroom. Vegetative cover is moderate and soils are characterized as loose, coarse alluvia. In the SBKR study area, this community is primarily associated with previously disturbed areas up on the upper terraces adjacent to the bridge abuttments.

Ruderal - Ruderal, non-native vegetation has successfully colonized the outskirts of the SBKR study area. Non-native cover is very high. Typical vegetation observed onsite consists of weedy non-native species such as wild oat (*Avena* sp.), shortpod mustard (*Hirschfeldia incana*), ripgut grass (*Bromus diandrus*), foxtail chess (*Bromus madritensis* ssp. *rubens*), tocalote (*Centaurea melitensis*), red-stemmed filaree (*Erodium cicutarium*), and horehound (*Marrubium vulgare*).

Riparian - In addition to the rich RAFSS habitat community found within the SBKR study area, patches of riparian habitat occur along the banks. This riparian habitat is in various seral stages and generally consists of tall, multilayered, open canopy riparian woodland. The characteristic vegetative species within this riparian habitat include; Fremont cottonwood (*Populus fremontii),* black willow (*Salix goodingii*), sandbar willow (*S. hindsiana*), and mule fat (*Baccharis salicifolia*). This riparian woodland has emerged with a complex canopy structure of varying layers of trees, shrubs, herbs and vines. The overstory within Mission Creek and at its confluence with the SAR averages over 35 ft in height.

The habitat within the study area is favorable for foraging, nesting, burrowing, and wildlife movement.

4.2.2 Commonly Observed Plants and Wildlife

Common native perennial floral species present in the SBKR study areas include chamise, California juniper, California buckwheat, deerweed, white sage, and California sagebrush. Common native annual species include wreath plant (*Stephanomeria virgata* ssp. *virgata*), slender buckwheat (*Eriogonum gracile*), California sun cup (*Camissonia bistorta*), California croton (*Croton californicus*), telegraph weed, and prickly cryptantha (*Cryptantha muricata*).

Common wildlife species seen and/or heard during the SBKR surveys include a number of local reptiles, birds, and mammals. Common reptiles encountered were the coastal western whiptail (*cnemidophorus tigris*), western fence lizard (*Sceloporus occidentalis*), and side-blotch lizard (*Uta stansburiana*). Approximately 15 bird species were detected. Common birds included black phoebe (*Sayornis nigricans*), northern mockingbird (*Mimus polyglottos*), rock wren (*Salpinctes obsoletus*), and western kingbird (*Tyrannus verticalis*). Excluding the small mammals captured during trapping, three mammals species were seen including the California ground squirrel (*Spermophilus beecheyi*), desert cottontail (*Sylvilagus audobonii*), and coyote (*Canis latrans*).

4.3 SBKR Trapping Surveys

Based on the suitable site conditions at the existing SAR rail road bridge crossing and known locations of SBKR in the nearby vicinity, it was determined that trapping studies were warranted. No limitations or constraints were identified that could influence the survey results. Surveys were conducted during the appropriate season, in good weather conditions, by a qualified biologist who followed all pertinent protocols. Weather conditions were clear and cool with calm winds. Table 2 below shows the tabulated weather data as it relates to the surveys.

Table 2. Survey dates, weather conditions, and moon phases

Survey Dates	%Cloud Cover	Wind (BFT)	Overnight Low Temp (°F)	Precipitation	Moon Phase
05/18	50	2	57	None	Waxing cresant
05/19	50	2	58	None	Waxing cresant
05/20	20	2	57	None	New moon
05/21	10	1	60	None	Waning cresent
05/22	0	2	63	None	Waning cresent
05/23	0	1	60	None	Waning cresent

Sign of various small mammals were observed within the areas of the trap lines and five (5) native rodent species were trapped in the SBKR survey area. No animals were marked as part of this survey so determining unique individuals versus recaptured individuals was not possible. The term “trap night” is used to relay how many individuals, per species were caught over the 5-night session. Each trap is counted as a trap night, so with 100 traps surveyed over five nights there was a total of 500 trap nights in the survey area. There were 143 captures over the five night trapping period.

Table 3. Species captured within the Phase 1 SBKR Survey Area

Species	Trap Nights
Dulzura Kangaroo Rat *(Dipodomys simulans)*	5
desert wood rat (*Neotoma lepida*)	10
cactus mouse (*Peromyscus eremicus*)	25
deer mouse (*Peromyscus maniculatus*)	75
San Diego pocket mouse (*Chaetodipus fallax fallax*)	28

(Phylogenetic listing per Jameson & Peters, California Mammals, 1988)

5 Conclusions

The trapping results show that SBKR do not currently occupy this area of the SAR. No SBKR were trapped over the course of the 5-night trapping survey. Given the absence of SBKR within the analysis area, there is no risk of taking individuals of this species in conjunction with implementing the proposed project. Although the project will not likely result in the loss of a federally listed species it may affect critical habitat. This project has a federal nexus, via permitting and funding, therefore project-related impacts to CH must be addressed through formal consultation with the USFWS.

5.1 San Bernardino Kangaroo Rat Critical Habitat

The USFWS is the principal Federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants and their habitats by enforcing Federal wildlife laws, administering the ESA, managing migratory bird populations, restoring nationally significant fisheries, and conserving wildlife habitat. The USFWS listed the SBKR as endangered on September 24, 1998 (63 FR 51005) and designated CH for this species on April 23, 2002 (67 FR 19812). On January 10, 2011 the Court rejected the USFWS's 2008 revised SBKR CH designation (FR 73, No. 202). As a result of this decision, this project is subject to the SBKR CH that was designated by the USFWS in 2002 (67 FR 19812).

The 2002 CH designation for the SBKR encompasses 33,295 acres of land in Riverside and San Bernardino counties, California. CH is defined in section 3(5)(A)(i) of the ESA, in part, as "*areas occupied by the species at the time of listing and containing those physical and biological features (Primary Constituent Elements (PCEs)) that are essential to the conservation of the species, and that may require special management considerations or protection. General requirements include, but are not limited to: space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species*".

The areas designated as CH for SBKR are identified in four separate units. The four units are within the geographical range of the SBKR and support the habitat the species requires for foraging, sheltering, reproduction, rearing of young, dispersal, and genetic exchange. This project falls within the Santa Ana River CH Unit (Unit 1), located in San Bernardino County. Unit 1 encompasses approximately 8,935 ac, and includes the SAR and portions of City, Plunge, and Mill Creeks. It is bounded by Seven Oaks Dam to the northeast. Although Seven Oaks Dam impedes sediment transport and reduces the magnitude, frequency, and extent of flood events, the system still retains partial fluvial dynamics because contributions from Mill Creek and other tributaries are not impeded by a dam or debris basin. This unit contains upland refugia and tributaries that are occupied by the species, active hydrological channels, floodplain terraces, and areas of habitat immediately adjacent to floodplain terraces. The functions and values of the SBKR CH within Unit 1 include: (1) Soil series consisting predominantly of sand, loamy sand, sandy loam, or loam; (2) Alluvial fan sage scrub and associated vegetation, such as coastal sage scrub and chamise chaparral, with a moderately open canopy; (3) River, creek, stream, and wash channels; alluvial fans; floodplains; floodplain benches and terraces; and historic braided channels that are subject to dynamic geomorphological and hydrological processes typical of fluvial systems within the historical range of the San Bernardino kangaroo rat; and (4) Upland areas proximal to floodplains with suitable habitat.

The Project area at the SAR is mapped within Unit 1 of designated SBKR CH. The CH within this portion of the Project area, specifically within the SAR between Waterman

Avenue and Orange Show Road, contains some PCEs for SBKR, is marginally suitable for SBKR and provides connectivity to large blocks of occupied habitat.

The new bridge will be up to 365 feet in length and will result in approximately 1.45 acres of impact including 0.84 acres of temporary disturbance and 0.61 acres of permanent disturbance to SAR channel bed/banks within SBKR CH. Temporary impacts to 0.84 acres and permanent impacts to 0.61 acres of the 8,935 acres of CH designated within Unit 1 will not result in an adverse modification of the CH designated in this unit. Furthermore, this Project will not change the hydrologic processes in any way that will contribute to further loss of PCEs elements identified for SBKR within the SAR.

5.2 Jurisdictional Waters & Regulatory Issues

The SAR is a jurisdictional river system characterized by active meander zones (within man-made levees) with quickly changing sedimentation and accretion patterns and a broad natural floodplain that frequently floods in the winter and spring. Construction of the Project may result in temporary and permanent alteration and fill of jurisdictional waters. Impacts to jurisdictional waters usually require regulatory approvals from the one or more of the following regulatory agencies: U.S. Army Corps of Engineers (Corps), Regional Water Quality Control Board (RWQCB), and/or CDFG.

Based on the projected impacts gathered from current documentation, the Project may require a Clean Water Act (CWA) Section 404 permit, CWA Section 401 Certification, and CDFG Code Section 1602 Streambed Alteration Agreement. Further, critical habitat (CH) has also been designated over parts of the Project area for the federally listed SWWF and Santa Ana sucker as well as SBKR. Below is a discussion the regulations and corresponding regulatory agency for which this project may need to consult.

Clean Water Act (CWA)- The CWA is the principal federal law that governs pollution in the nation's lakes, rivers, and coastal waters. Originally enacted in 1972 as a series of amendments to the Federal Water Pollution Control Act of 1948, the Act was last amended in 1987. The overriding purpose of the CWA is to "restore and maintain the chemical, physical and biological integrity of the nation's waters." The statute employs a variety of regulatory and non-regulatory tools to eliminate the discharge of pollutants into the nation's waters and achieve water quality that is both "swimmable and fishable".

Under Section 404 of the CWA, the Corps has primary federal responsibility for administering regulations that concern the discharge of dredged or fill material into waters of the U.S. (including wetlands). Waters of the U.S. (WoUS) are defined as: "*All waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters"* (Section 404 of the CWA; 33 CFR 328).

The limit of the Corps jurisdiction for non-tidal waters (including non-tidal perennial and intermittent watercourses and tributaries to such watercourses) in the absence of

adjacent wetlands is defined by the ordinary high water mark. The ordinary high water mark (OHWM) is defined as: "*The 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* (Section 404 of the CWA; 33 CFR 328). Wetlands are defined as: *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 saturated soil conditions"* (Section 404 of the CWA; 33 CFR 328).

Porter-Cologne Water Quality Control Act (Porter-Cologne)- Porter-Cologne is the principal State law that governs water protection efforts in California. Porter-Cologne establishes the State Water Resources Control Board (SWRCB) and each of the nine RWQCBs as the principal state agencies for coordinating and controlling water quality in California. The RWQCB typically regulates discharges of dredged or fill material into WoUS pursuant to Section 401 of the CWA, however, they also have regulatory authority over waste discharges into Waters of the State, which may be isolated, under Porter-Cologne. In the absence of a nexus with the Corps, the RWQCB requires the submittal of a Waste Discharge Requirement (WDR) application, which must include a copy of the project Storm Water Pollution Prevention Plan (SWPPP) and a copy of the project Water Quality Management Plan (WQMP), otherwise called a Standard Urban Stormwater Management Plan (SUSMP). The RWQCB's role is to ensure that disturbances in the stream channel do not cause water quality degradation.

California Fish and Game Code (FGC) - Sections 1600 to 1616 of the California FGC require any person, state, or local government agency or public utility to notify the CDFG before beginning any activity that will substantially modify a river, stream, or lake. If it is determined that the activity could substantially adversely impact an existing fish and wildlife resource, then a Lake or Streambed Alteration Agreement is required.

Like the Corps and RWQCB, the CDFG also regulates discharges of dredged or fill material. The regulatory jurisdiction of CDFG is much broader however, than Corps or RWQCB jurisdictions. CDFG regulates **all** activities that substantially alter streams and lakes and their associated habitats. The CDFG, through provisions of the FGC Sections 1601-1603 is empowered to issue agreements for any substantial alteration of a river, stream, or lake where fish or wildlife resources may be adversely affected. Streams (and rivers) are defined by the presence of a channel bed and banks. The CDFG typically extends the limits of their jurisdiction laterally beyond the channel banks for streams that support riparian vegetation. In these situations the outer edge of the riparian vegetation is generally used as the lateral extent of the stream and CDFG jurisdiction. CDFG regulates wetland areas only to the extent that those wetlands are a part of a river, stream, or lake as defined by CDFG.

California Endangered Species Act (CESA) - The CDFG administers the California Endangered Species Act (CESA). The State of California considers an endangered species one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management, and a rare species is one present in such small numbers

throughout its range that it may become endangered if its present environment worsens. “Rare species” classification applies to California native plants. The State definition of “take” is narrow and specifically refers to the direct loss of a State-listed species.

Provisions within the FGC protect all native birds of prey and their nests (FGC §3503.5), and all non-game birds (other than those not listed as Fully Protected) that occur naturally in the State (§38oo). The handful of species, such as the California condor, that are designated by the State as “fully protected” received this rare designation through special legislation. There is no mechanism allowed for CDFG to issue take authorization for a fully protected species. Species of Special Concern is an informal designation used by CDFG for some declining wildlife species that are not proposed for listing as threatened or endangered, such as the burrowing owl. This designation does not provide legal protection, but signifies that these species are recognized as sensitive by CDFG.

Federal Endangered Species Act (ESA) - Special status species are native species that have been afforded special legal protection because of concern for their continued existence. The USFWS enforces the provisions of the federal ESA. Section 9 of the ESA prohibits the "taking" of a listed species by anyone, including private individuals, and state and local agencies. The term "take" under federal law means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. "Take" can include adverse modification of habitats used by a threatened or endangered species during any portion of its life history. Threatened and endangered species on the federal list (50 CFR Sections 17.11 and 17.12) are protected from indirect and/or direct or take. If "take" of a listed species is necessary to complete an otherwise lawful activity, this triggers the need for consultation under Section 7 or Section 10 of ESA. A Biological Opinion with incidental take provisions would be rendered. Pursuant to the requirements of the ESA, a federal agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present in the study area and whether the proposed project will have a potentially significant impact upon such species.

Under the ESA habitat loss may be considered an impact to the species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species that is proposed for listing under ESA or to result in the destruction or adverse modification of CH proposed to be designated for such species. The term "critical habitat" for a threatened or endangered species refers to the following: specific areas within the geographical range of the species at the time it is listed that contain suitable habitat for the species, which may require special management considerations or protection; and specific areas outside the geographical range of the species at the time it is listed that contain suitable habitat for the species and is determined to be essential for the conservation of the species. Under Section 7 of the ESA, all federal agencies (including USFWS) are required to ensure that any action they authorize, fund, or carry out will not likely jeopardize the continued existence of a listed species or adversely modify their CH.

Pursuant to CEQA, project-related impacts to these species, or their habitats, would be considered significant and require mitigation.

Migratory Bird Treaty Act- Migratory birds are protected under the federal Migratory Bird

Treaty Act (MBTA) of 1918 (16 U.S.C 703-711). The MBTA provides protection for nesting birds that are both residents and migrants whether or not they are considered sensitive by resource agencies. The MBTA prohibits take of nearly all native birds. The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment or forced fledging would be considered take under federal law. The USFWS, in coordination with the CDFG administers the MBTA. CDFG's authoritative nexus to MBTA is provided in FGC Sections 3503.5 which protects all birds of prey and their nests and FGC Section 3800 which protects all non-game birds that occur naturally in the State.

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Figures

Figure 1. Aerial Overview of SBKR Survey Area

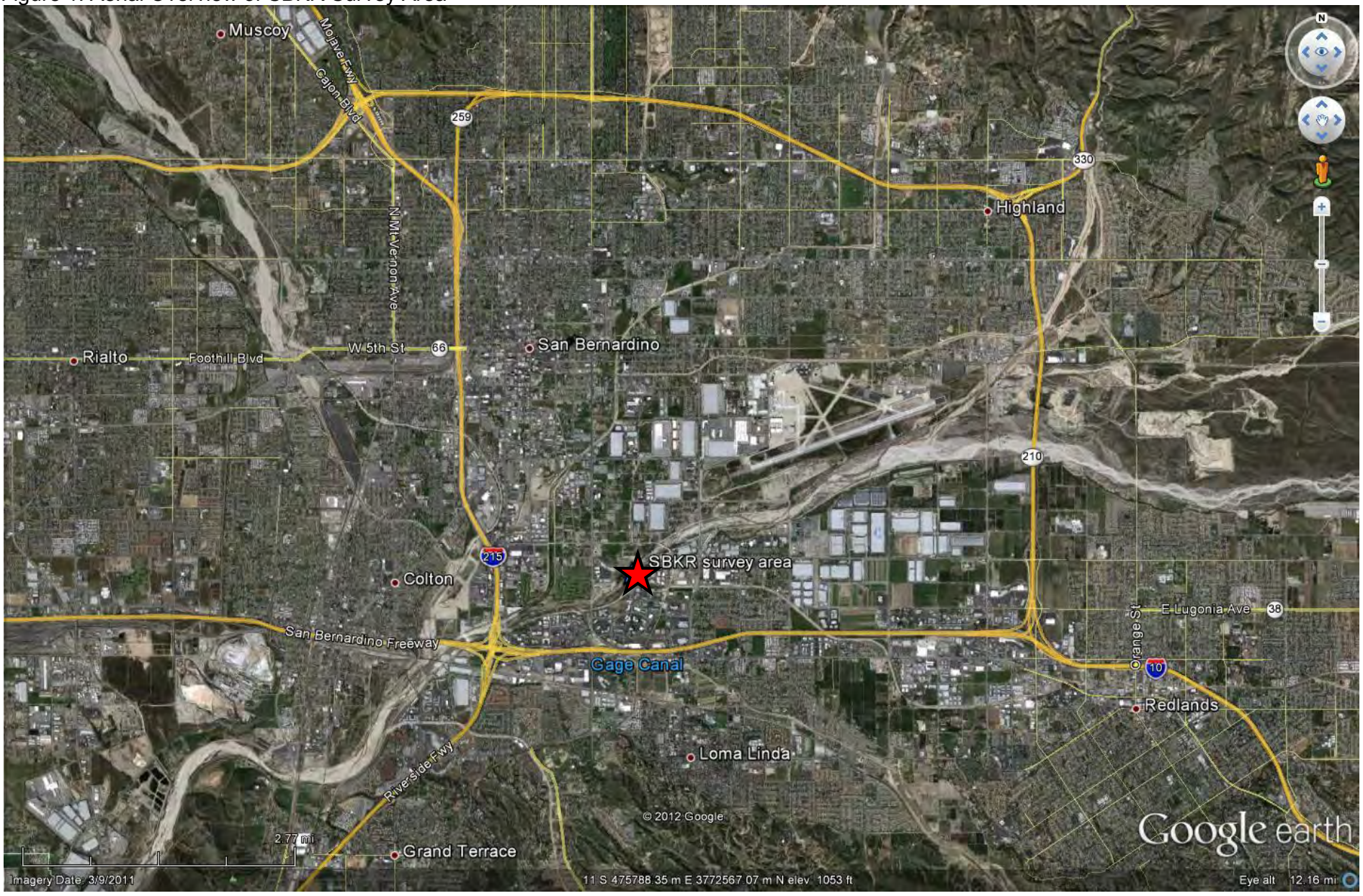

Figure 2. Aerial View of SBKR Survey Area with Critical Habitat Overlay

Figure 3. Aerial View of SBKR Survey Area Site Location

Photos of SBKR Survey Area

Photo 1. Standing on west side of bridge looking north/northeast.

Photo 2. Standing on east side of bridge looking north/northwest.

Photo 3. Standing on north side of SAR as rail road approaches abutment looking southeast.

Photo 4. Standing at Mission Creek confluence with the SAR looking northeast at SAR bridge crossing.

APPENDIX H

Santa Ana Sucker Habitat Evaluation

Santa Ana Sucker Habitat Evaluation

Redlands Passenger Rail Project

5 October 2012

Cardno ENTRIX

Shaping the Future

Santa Ana Sucker Habitat Evaluation

Redlands Passenger Rail Project

5 October 2012

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Acronyms

BMP	best management practice
CDFG	California Department of Fish and Game
CIP	cast in place
CISS	concrete in steel shell
cm	centimeter
fps	feet per second
ins	inches
PCE	primary consituent element
PRD	Permit Registration Document
ROW	right-of-way
RPRP	Redlands Passenger Rail Project
SANBAG	San Bernardino Association of Governments

SCRRA	Southern California Regional Railroad Authority
SWPPP	Storm Water Pollution Prevention Plan
USFWS	U.S. Fish and Wildlife Service

1 Introduction

The Redlands Passenger Rail Project (RPRP) would implement rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. One part of this project is to remove and replace the existing rail bridge over the Santa Ana River. This report evaluates habitat for the Santa Ana sucker (*Catostomus santaanae*) in this segment of the river and the potential for impacts from construction and operation of the project on this species and its designated critical habitat.

2 Project Description

The RPRP would involve implementation of rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. The Project would include the construction of track improvements to facilitate train movements along a single track through the rail corridor with an approximately 10,000-foot-long section of passing track or siding, from just west of Richardson Street to just east of California Street (MP 5.5 to MP 7.4). The proposed track ballast and sub-grade along the 9-mile project corridor would be constructed to 50 feet in width, sufficient to support a parallel maintenance road. This would require demolition and replacement of the existing track. These improvements would adhere to standards established by the BNSF Railway and Southern California Regional Railroad Authority (SCRRA) for the rail, rail ties, ballast and subballast materials, grade crossing panels, placement of drainage structures and retaining walls, and horizontal and vertical clearances.

The Project would be constructed within an existing railroad right-of-way (ROW) owned by the San Bernardino Associated Governments (SANBAG), which averages 50 to 100 feet in width except in portions of downtown Redlands where the ROW is less than 40 feet wide. The rail improvements would also include the construction of a new train signaling and communications system.

The Project would require the replacement or retrofitting of up to six structural crossings to facilitate the loading requirements of the Metrolink trains and track foundation. Five of the six structural crossings consist of existing bridge structures, including the Santa Ana River crossing (Bridge 3.4). That existing Santa Ana River bridge would be replaced, at the same location, with a new steel beam bridge up to 365 feet long. The work would temporarily affect up to 0.84 acre and permanently affect up to 0.61 acre of Santa Ana River bed and banks (Figure 1). Construction of this crossing would take approximately nine months.

Construction access/staging would occur from the north end of the western bank. Access to the eastern bank would occur via construction of a temporary bridge crossing (earthen fill) from the west (see Figure 1). Existing bridge and bridge piers (support structures = bents) would be removed following installation of the new bridge piers. The new bridge would have up to five bents placed within the river channel compared to three (plus one at each bank) at the existing bridge, and the piers would be longer to support a second future rail track (see Figure 2). The new structural supports would be constructed behind an encircling temporary cofferdam of sheet piles or similar method, such as the use of Concrete in Steel Shell (CISS) piles, depending on contractor preference. The foundation would consist of reinforced concrete supported by bored and cast-in-place (CIP) pilings, with conventional reinforced CIP concrete piers extending up to the bridge deck. In the event that water is present in the river, it would be diverted around the work area. Best management practices (BMPs) as detailed in the project Storm Water Pollution Prevention Plan (SWPPP) will be implemented to ensure that construction materials, including concrete, do not come in contact with the river water. To minimize the potential for debris to fall into the Santa Ana River during bridge construction, a debris containment system would be installed under the bridge to catch any falling debris. If flow is present and as an additional precaution, a boom would be strung across the water feature to keep any material that escapes the containment system from being carried downstream.

Erosion, sedimentation, and hazardous materials spills or leakage from construction vehicles is also considered a potential impact to water quality. To address these issues, the project will require the contractor to conduct vehicle refueling within the staging/assembly area, a minimum of 50 feet from wetland areas. The project will include preparation of a SWPPP as well as other Permit Registration Documents (PRDs) by the project engineer or contractor. The SWPPP will identify BMPs to address potential short-term impacts and post-construction (long-term) measures to be implemented for the

Figure 1 RPRP Footprint SAR Bridge 3.4

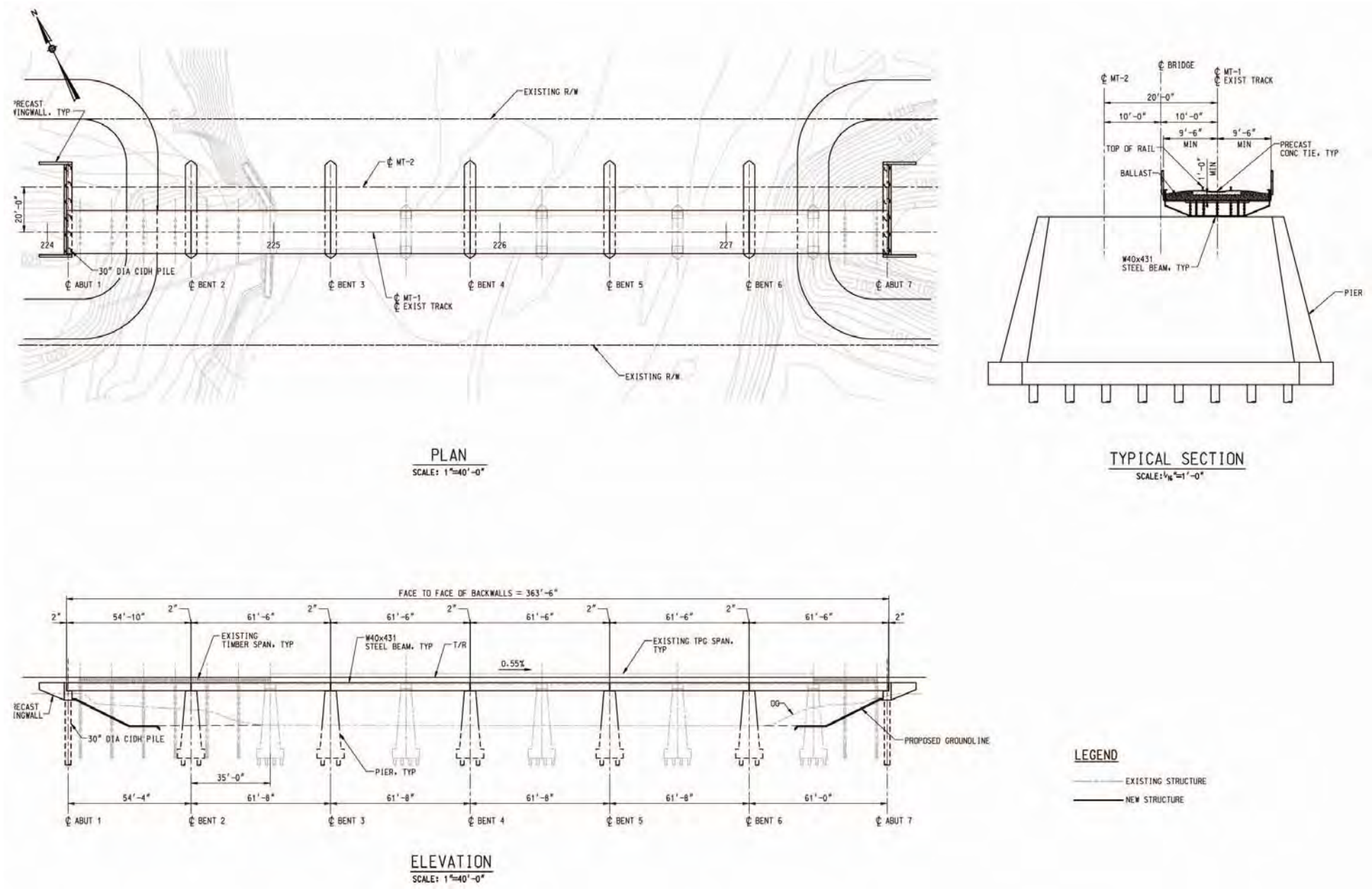

Figure 2 RPRP Bridge 3.4 Plan

project. Stormwater pollution prevention BMPs included as a part of the SWPPP would be implemented in accordance with the California Stormwater Construction Handbook (latest edition) and the Construction General Permit Order no. 2009-0009-DWQ. Construction could also involve limited dredging of material from the channel bed and/or excavation along the adjacent banks. These activities could also include the placement of fill including concrete and riprap. To minimize construction activity in the river channel, the structural improvements would be constructed in two or more increments to minimize disturbance to the channel bottom and allow for the safe passage of water flow. A similar approach would be employed for the removal of any existing structures.

If flow is present during construction, temporary diversion of water may be required. The diversion may consist of a temporary bypass using a pipe, flume, excavated channel, or alternative method that temporarily reroutes water around the construction area. The method would ultimately be at the discretion of the construction contractor. Surface water diversion BMPs would be required to prevent or reduce mingling of construction-related runoff with upstream non-construction-related runoff so as to prevent the introduction of sediment, nutrients, pesticides, and/or other pollutants to local waterways during construction.

Operation of the RPRP would involve trains every 30 minutes in the peak periods and every hour in the off-peak period. This would translate to 25 average daily round trips along the alignment during weekdays. Maintenance of the rail ROW is currently the responsibility of BNSF, which is the current operator of the rail line. This includes routine maintenance of the track and track ties, grade crossings, and communication system. Vegetation management and weed abatement would also be required along the ROW. A contractor hired by SANBAG would conduct all maintenance activities and inspections, including those for the Santa Ana River Bridge, in accordance with SCRRA/Metrolink and BNSF standard practices.

3 Santa Ana Sucker Description

3.1 Status

The Santa Ana sucker was federally listed by the U.S. Fish and Wildlife Service (USFWS) as a threatened species on April 12, 2000 (65 FR 19686, USFWS 2004). In California, it is listed as a species of special concern (California Department of Fish and Game (CDFG) 2011).

3.2 Species Description

The Santa Ana sucker, a member of the sucker family of fishes (Catostomidae), is a small, short-lived fish generally less than 6.3 inches (ins) (16 centimeters (cm)) in length; however, they have been collected at lengths up to 8 ins (20.3 cm) (Russell 2010, as cited in USFWS 2012). Santa Ana suckers have downward oriented mouths with fleshy, protrusible lips and jaws with cartilaginous scraping edges which allow them to suck up small invertebrates, algae, detritus, diatoms, fish eggs, and other organic matter for food (Moyle 2002, USFWS 2004). Coloration is typically silvery-white on the belly and dark gray on the sides and back, with irregular dorsal blotches on the sides and faint patterns of pigmentation arranged in lateral stripes (Moyle 2002).

The Santa Ana sucker is usually found in permanent pools and runs of small to medium size (less than 7 meters in width), and in water ranging in depth from a few centimeters to greater than a meter (USFWS 2004). The preferred substrate for this species includes gravel, rubble, and boulder and is generally coarse; although, individuals have been found in streams with sand/mud substrates (USFWS 2004). Flow throughout the habitat is described as slight to swift; some populations occur in streams that are subject to periodic and severe flooding (USFWS 2004). This species prefers overhanging riparian plants for shelter, and does not require streamside cover when larger, deeper holes and riffles are present for refuge (USFWS 2004).

Santa Ana sucker spawning may occur between mid-March and early-July, with peak activity usually in April (Moyle 2002). Spawning habitat typically consists of gravelly-riffles. The fertilized eggs adhere to the substrate and hatch within 30 days. Females are very fecund and can produce between 4,423 and 16,151 eggs (USFWS 2004). The high fecundity of the Santa Ana sucker, in combination with early sexual maturity and a protracted spawning period allows this species to quickly repopulate streams following periodic flood events that could decimate populations (Moyle 1976 as cited in USFWS 2000). Santa Ana suckers in the Santa Clara River generally mature during their second summer and die at the end of their third summer although some individuals have been observed to survive through a fourth or even fifth summer (Moyle 2002, Drake 1988 as cited in USFWS 2012).

3.3 Distribution

Historically, the Santa Ana sucker was native to the rivers and larger streams of the Los Angeles Basin (Los Angeles, San Gabriel, and Santa Ana river drainages) in Los Angeles, Orange, Riverside, and San Bernardino counties (USFWS 2000). There are very few records of the historic range of this species, but it is presumed that Santa Ana suckers ranged from near the Pacific Ocean to the uplands of the Los Angeles and San Gabriel river systems and at least up to the San Bernardino National Forest boundary in the Santa Ana River (Swift et. al. 1993 as cited in USFWS 2000).

Currently, native noncontiguous populations of Santa Ana suckers occur in the Santa Ana River, lower Big Tigunga Creek in the Los Angeles River drainage, and East, West, and North forks of the San Gabriel River (USFWS 2012). A small population is located in the Santa Clara River, although it is believed that this is an introduced population (USFWS 2004). In the Santa Ana River, Santa Ana suckers are found in the lower river and its tributaries from Prado Dam to near California State Highway 90 and in the middle

river and its tributaries from south of La Cadena Drive, where wastewater discharges provide perennial flow, to Prado Dam. It is believed that the Santa Ana sucker has lost approximately 70 percent of its historical native range in the Santa Ana River watershed and 75 percent of its historic range overall (USFWS 2000).

3.4 Critical Habitat

On December 14, 2010 (75 FR 77962–78027, USFWS 2010), critical habitat was revised for Santa Ana sucker, designating critical habitat in Los Angeles, Orange, Riverside, and San Bernardino counties, California. The designated critical habitat includes approximately 9,331 acres (3,776 hectares) of Federal, State, and private lands. Three units were designated (Unit 1: Santa Ana River, Unit 2: San Gabriel River, and Unit 3: Big Tujunga Creek, a tributary to Los Angeles River). Designated areas that were occupied by the Santa Ana sucker at the time of listing contain the physical and biological features essential to the conservation of Santa Ana sucker and may require special management considerations or protection. Additionally, certain areas have been designated critical habitat that are outside areas occupied by the Santa Ana sucker at the time of listing that are essential for conservation of the species. These areas are essential because they contribute to the maintenance of the physical and biological features within the occupied critical habitat by providing sources of water and coarse sediments necessary to maintain all life stages of the Santa Ana sucker (USFWS 2012).

The primary constituent elements (PCEs) for the Santa Ana sucker are:

1. A functioning hydrological system within the historical geographic range of the species that experiences peaks and ebbs in water volume (naturally or regulated) that encompasses areas that provide or contain sources of water and coarse sediment necessary to maintain all life stages, including adults, juveniles, larvae, and eggs.
2. Stream channel substrate with a mosaic of loose sand, gravel, cobbles, and boulders in a series of riffles, runs, pools, and shallow sandy stream margins necessary to maintain various life states of the species.
3. Water depths greater than 1.2 ins (3 cm) and bottom water velocities greater than 0.01 feet per second (0.03 meters/second).
4. Clear or only occasionally turbid water.
5. Water temperatures less than 88°F (30°C).
6. Instream habitat that includes food sources (e.g., phytoplankton, zooplankton, and aquatic invertebrates) and associated vegetation (e.g., aquatic emergent plants and adjacent riparian vegetation) that provides shading to reduce water temperature, shelter during periods of high water velocity, and protective cover from predators.
7. Areas within perennial stream courses that may be periodically dewatered, but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted.

All occupied designated critical habitat units contain these PCEs in the appropriate quantity and spatial arrangement essential to conservation of the species.

The proposed project is located near the upstream edge of Unit 1, Subunit 1B, in an area that is not currently occupied due to the barrier to upstream movement at La Cadena Drive. This subunit was considered occupied at the time of listing and provides sources of water (PCE 1) and coarse sediment (PCE 2) for downstream occupied habitat (USFWS 2010). Because the project site is not currently occupied, PCEs 3-7 do not apply.

4 Project Site Evaluation

4.1 Description of site

The existing rail bridge over the Santa Ana River is located about mid way between the East Orange Show Road (upstream) and South Waterman Avenue (downstream) road crossings, and is approximately 0.9 mile downstream of Tippecanoe Avenue. The active river channel is approximately 250 feet wide at the rail crossing but wider upstream and narrower downstream. Flow is intermittent at this location and results from storm runoff during the rainy season and releases from Seven Oaks Dam in the dry season prior to fall/winter rains. The remainder of the time the channel is dry.

Substrate at the project site is primarily sand with some coarser material mixed in. Sand dominates the river bed downstream to the Prado Basin. Course materials (gravel and cobbles) from upstream sources pass through the project area during larger runoff events when water velocity is high enough to transport them.

A number of barriers to upstream fish movement occur downstream of the project site. These include grade control structures at the I-10 freeway crossing and La Cadena Drive. Downstream distance to occupied habitat from the project site is approximately 2.25 miles.

The river banks support a mix of native and non-native shrubs and trees.

4.2 Critical habitat functions

As noted above, the project area is within critical habitat Unit 1, Subunit 1B in an area that is not currently occupied by the species but provides transit of water (PCE 1) and coarse materials (PCE 2) downstream to occupied habitat. The existing rail bridge supports do not appear to substantially affect water or sediment transport downstream to occupied habitat based on hydraulic modeling which shows that the water surface elevation would be 1017.3 feet with a velocity of 15.6 feet per second (fps) at the bridge during a 100-year flow event (HDR 2012). The existing bridge has three supporting piers in the river channel, another one on the south bank, and a wingwall on the north bank (Figure 2). The piers are 6.5 feet wide and approximately 25 feet long (oriented parallel to river flow). The small area taken up by the piers is less than 9 percent of the river width from base of bank to base of bank. It is even less for bank-full width.

5 Potential for Project Effects

5.1 Construction

Construction of the new bridge would result in disturbances within the river channel and on the banks related to access, installation of temporary cofferdam(s) or CISS piles, dredging in the river bed and/or excavation along the banks, and removal of the cofferdam(s) or CISS piles when construction is completed. Dredging and/or excavation of the river banks under the bridge to widen the channel would have the potential to cause suspension of fine sediments if the work occurs in flowing water or the disturbed soils later are exposed to flowing water before those soils are stabilized. Cofferdam or CISS pile installation activities would temporarily disturb the river bed and would isolate a small amount of the bed from flows since the work could be conducted during at least some periods of flow. These small disturbances would not adversely affect water or sediment transport downstream. The temporary cofferdam(s) or CISS piles would isolate construction activities, including pouring of concrete, from the waterway. Therefore, construction-related impacts on turbidity and suspension of sediments would be limited to the actual installation and removal of the temporary cofferdam(s) or CISS piles, with removal more likely to suspend sediments than installation. Removal of the existing bridge support structures in and adjacent to the river channel would have similar effects on sediment suspension. Their removal would allow water to pass through those locations.

Construction of a temporary earthen fill access road down the west bank and across the river to the east bank would place sediments within the river channel that could be eroded by river flows during the work period, when the road is present. If any flow is present or becomes present during the work, portions of the fill could be washed downstream. Driving equipment across that flow would suspend sediments and have the potential to wash pollutants off the equipment into the water. The source of earthen material used and duration that the road is in place would determine the potential for and type of sediments that could be suspended and carried downstream with effects as described below.

Diversion of flow away from specific work areas, such as bank excavation or support structure construction, would have the potential to result in temporary suspension of sediment as the diversion is put in place and then when it is removed. Operation of the diversion could also cause sediment suspension if adequate energy dissipation is not included at the discharge location.

Sediments suspended during low-flow periods would primarily be sand and silt that would rapidly settle before reaching occupied Santa Ana sucker habitat. Sediments suspended by construction activities during higher flows would add a small increment to the suspended sediment load caused by the higher velocity water that would not adversely affect occupied habitat downstream. Construction of the cofferdam(s) or CISS piles would normally be limited to the period between April and September, and is expected to take approximately four weeks, when river flows are relatively low, resulting in little to no transport of fine sediment downstream to occupied habitat.

Leaks of fuel, hydraulic fluid, and/or lubricants from equipment working in or above the river channel, although unlikely, have a potential to contaminate dry or moist river bed sediments when no flow is present. This contamination, if not cleaned up immediately, could be transported downstream during higher flow events to occupied Santa Ana sucker habitat. Leaks into flowing water would be transported downstream and could reach occupied habitat.

5.2 Operations

The new bridge supports are not anticipated to alter sediment and water transport downstream. Each would be the same width as the existing piers but approximately 20 feet longer (parallel to flow). The river channel under the new bridge would be widened, particularly on the north side, so that the five new piers

would be in the channel. Hydraulic modeling shows that, relative to the existing bridge, the new bridge would result in a slightly lower water surface elevation and velocity during a 100-year flow event (HDR 2012). Thus, the new bridge would not impede water transport under the bridge. The new bridge would not change water surface elevation downstream of the bridge and thus would not affect water or sediment transport downstream.

The new armoring along the reconfigured west bank would add a small amount of turbidity to river flows during initial runoff events after construction is completed that wash fines on the rock surfaces off into the river and/or when higher flows contact the new rock and wash off the fine sediments adhering to the rock surface. The input of sediment would be temporary and would add a negligible amount to the existing sediment load during such runoff events with no adverse effects on occupied habitat downstream.

Operation of the trains at an average of 25 round trips per day would have the potential to contribute small amounts of pollutants, such as lubricants and fine metal/plastic particles from normal wear of moving parts (e.g., wheels and brakes) under the train, to the river through dry fallout or rainfall runoff from the train/bridge. These could add to pollutants downstream in occupied habitat during runoff events that transport water and sediments downstream. The quantities of these pollutants are expected to be small, particularly if the trains are regularly maintained and cleaned. Maintenance activities for the track and bridge also have the potential to introduce pollutants into the river in a similar manner.

6 Recommended Protection Measures

The following measures are recommended to minimize the potential for effects of the project on Santa Ana sucker critical habitat and downstream occupied habitat.

1. Provide environmental training for all construction workers that discuses the Santa Ana sucker, its critical habitat, and protection of habitat and water quality.
2. Include in the SWPPP measures for immediate cleanup of spilled or leaked pollutants within the river channel, energy dissipation for diversion outflows, and monitoring/maintenance of BMPs during construction.
3. Place culverts under temporary access road fill sized to pass maximum anticipated low flows in the river, and remove temporary access road fill (and culverts) prior to any expected higher river flows that could wash out that road.
4. Monitor during construction activities in the river channel to ensure that pollutants are not introduced into the river sediments or water.
5. Maintain and clean rail cars to minimize the amount of lubricants and metal/plastic particles from normal wear that could fall into the river channel as the trains cross the bridge.
6. Provide environmental training to bridge/rail maintenance personnel that includes BMPs to use to prevent pollutants from entering the river.

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APPENDIX I

Hydrology and Hydraulics Report for Bridge 3.4

SANBAG Redlands Passenger Rail Project

Job Name: Hydraulic Impact Analysis – Santa Ana River Bridge 3.4
Job Number: 170063
Client: SANBAG
Consultant: HDR Engineering, Inc.

This report and the analysis and design calculations contained herein have been prepared under the supervision of the following Registered Civil Engineer:

_____ August 2012

Mark Seits, P.E. Date
CA 41103

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List of Exhibits

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Exhibit 2: Santa Ana River Reach Limits
Exhibit 3: Modeling Overview–Cross-Sections
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1. Purpose

The rail from historic Warm Creek (that portion of Warm Creek that was not combined with East Twin Creek and Warm Creek Improvements) to Mill Creek Zanja is proposed to be improved as part of the Redlands Passenger Rail Project (RPRP) (see Exhibit 1).This report covers the hydraulic impacts for AT&SF Bridge 3.4 (Bridge 3.4), which is a railroad crossing over Santa Ana River. The improvements are proposed to reconstruct the bridge from its existing freight-only operation to current standards required for regular passenger rail operations. As part of this project, recommendations, including hydraulic analysis, are being provided to assist in this process.

The purpose of the hydraulic modeling is to: (1) to analyze the existing hydraulic condition of the Santa Ana River to establish current conditions considering Federal Emergency Management Agency (FEMA) models and updated site conditions; (2) evaluate the hydraulic impact on the rail from proposed Bridge 3.4; and (3) evaluate the potential hydraulic impacts of proposed Bridge 3.4 on the proposed passenger rail.

2. Background

The RPRP will design a double track alignment for passenger and freight service from the proposed San Bernardino Transit Center east to the University of Redlands. The Redlands Corridor Strategic Plan (RCSP) was developed by San Bernardino Associated Governments (SANBAG) to address the transportation needs of the Redlands Corridor, assess the capability of transit service and multimodal improvements to meet mobility needs, and describe a course of action to implement transit service in the Redlands Corridor in a cost-effective manner. The first phase of the RCSP calls for the development of a passenger rail service operating between the San Bernardino Transit Center and the University of Redlands, a distance of approximately nine miles. Exhibit 1 shows the overall project.

The general hydraulic modeling approach was to initially review hydraulic models from FEMA to examine flooding conditions in the Santa Ana River reach with Bridge 3.4. Exhibit 2 shows the limits of the analysis. A revised hydraulic model was developed of the project area based on the additional information obtained to model existing and proposed conditions through the bridge and to evaluate the relative changes in water surface for a 100-year flood. The proposed bridge will be designed per structure, constructability, and geotechnical and hydraulic issues.

The Santa Ana River model reach in this study is located between River Mile (RM) 28.3 to RM 29.64, from approximately 1,660 feet downstream of AT&SF Bridge 3.4 to 700 feet upstream of Tippecanoe Avenue (see Exhibit 2). Total reach length is approximately 7,000 feet. The reach is a soft-bottom channel with riprap side slopes. Figure 1 shows Bridge 3.4 downstream face in the Santa Ana River. Figure 2 shows the rail on existing Bridge 3.4. Hydraulic analyses are required to evaluate the existing and proposed bridges to determine if they meet current design requirements. There are three structures in the reach, as shown below in Table 1.

Table 1: Structures in Santa Ana River Reach

Structure	Approximate Location (RM)
AT&SF Railroad Bridge 3.4	28.62
Orange Show Road	29.06
Tippecanoe Avenue	29.51

The existing effective FEMA model for the Santa Ana River was obtained and used as the base model. The model was revised based upon information contained in the WRC (2003) report prepared to model proposed river trail improvements. Modeling of the Santa Ana River and Bridge 3.4 was conducted using the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center River Analysis System (HEC-RAS v4.1) program. All reference topography is based on the NGVD 1929 datum.

The standard freeboard criteria selected for the bridge (in the following priority) are shown below. For this project, because the 50-year flow rate is not available, only the 100-year flow rate was evaluated.

1. 100-year water surface elevation below low chord;
2. 100-year energy grade line (EGL) elevation below top of subgrade and 50-year water surface [hydraulic grade line (HGL)] elevation below low chord;
3. 50-year water surface (HGL) elevation below low chord; and
4. No increase of water surface elevations within project area.

Figure 1: Santa Ana River, AT&SF Bridge 3.4 Downstream Face

A draft FEMA "no rise" certificate is included within this report. Bridge 3.4 is within a FEMA floodway and therefore this certification is required to document that no change to 100-year base flood elevation will occur due to bridge replacement.

This report presents hydraulic analysis results; however, it does contain some assumptions and approximations. Prior to 100% design, the assumptions and approximations made within this report should be verified. Primarily, these include the proposed bridge geometry.

Figure 2: Existing AT&SF Bridge 3.4

3. Hydrology

The 100-year flowrate for the Santa Ana River tabulated in the San Bernardino County Flood Insurance Study (FIS) is 113,000 cfs upstream of Warm Creek. The 100-year Santa Ana River flow rate contained in the effective FEMA model and in the WRC report and model are less. The flowrate of 113,000 cfs is believed to be the flowrate before the construction of Seven Oaks dam upstream of the reach. The 100-year flowrate in Santa Ana River FEMA and WRC model are the same and are verified with "Santa Ana River Trail Hydraulic Design and Analysis" and "Santa Ana River Mainstream Project, Feature Design Memorandum No. 2" reports. The 100-year flowrates in the FEMA model are shown in Table 2 and indicate a flow change location just downstream of Bridge 3.4. The 100-year discharge at Bridge 3.4 is 33,000 cfs and was used for this evaluation.

Table 2: Hydrology - Flowrates

Channel Reach (River Mile)	100-Year Flood Discharge (cfs)
RM 27.91 to RM 28.57	36,500
RM 28.58 to RM 33.27	33,000
Note: Flowrates are in cubic feet per second (cfs)	

4. Hydraulic Modeling

4.1 Modeling Overview

Hydraulic modeling was conducted using the USACE HEC-RAS (v.4.1) program. The existing FEMA effective model was available in HEC-2 format for the Santa Ana River reach. The FEMA effective models were broken into several reaches. Bridge 3.4 is located in the reach from River Mile (RM) 28.30 to 29.64, which covers from downstream of Bridge 3.4 to upstream of Tippecanoe Bridge. The HEC-2 model was originally modeled in July 1987, then revised in January 1990. There are two structures in the model –Bridge 3.4 and Tippecanoe Bridge. Bridge 3.4 is located at RM 28.615.

The original HEC-2 model does not include the Orange Show Bridge. Also, bridge piers were modeled as one pier with the total pier width in the HEC-2 model. WRC Consulting Services prepared "Santa Ana River Trail, Alabama Street to Waterman Avenue, Hydraulic Design and Analysis" in 2003 and updated the original effective model. The WRC model reach ranges from RM 26.98 to 33.37. There are three models in the WRC report:

- ***Model 1*** – Original FEMA effective HEC-2 model prepared by the USACE.
- ***Model 2*** – Converted Model 1 to the HEC-RAS format, added an additional bridge at Orange Show Road, revised bridge pier data to match existing, and added channel geometry from RM 28.10 to 29.51 based on as-built plan data.
- ***Model 3*** – Prepared from Model 2 for the proposed trail ramps and removed them from flow conveyance.

Only a hard copy of the WRC report was available. Digital copies of the HEC-RAS models described in the report were not available. Since the report has tabulation of the HEC-RAS input and output data, HDR first converted the effective FEMA HEC-2 model to HEC-RAS format, then revised the HEC-RAS model per the WRC report Model 2 input data printout to duplicate Model 2. The bridge pier widths were revised based on the as-built/survey data in the WRC report. This HEC-RAS model was then used to address the impact of the proposed improvements to Bridge 3.4. The 100-year flowrate was used to compare between the existing bridge and the proposed condition to see if the proposed condition has any hydraulic impacts.

4.2 Model Inputs

4.2.1 FEMA Effective Model

The effective HEC-2 model was obtained from FEMA. The original model was run with the HEC-2 (v.1991) program. The model files were provided by FEMA. Model results are shown on FEMA Flood Insurance Rate Map (FIRM) panel 06071C8684H. See Exhibit 4: FEMA FIRM 06071C8684H.

4.2.2 Duplicate Effective Model (HEC-2)

The HEC-2 model provided by FEMA was run by HDR using the HEC-2 (1991) program. The results run by HDR match the FEMA Effective model results. As explained, Model 1 in the WRC report is the same model as the Duplicate Effective Model prepared by the U.S. Army Corps of Engineers.

4.2.3 Corrected Effective Model (HEC-RAS)

The Duplicate Effective model was imported to HEC-RAS (v4.1). Minor discrepancies are explained by the differences between the HEC-2 (1991) and HEC-RAS (v4.1) programs. The Corrected Effective Model was developed based on the information available in WRC report. Model 2 in WRC report added an additional bridge model at Orange Show Road, added channel geometry from River Mile (RM) 28.10 to 29.51, and revised pier data at all bridges.

As explained, the WRC HEC-RAS model was not available, but the input and output of the HEC-RAS model were contained in the WRC report. The HEC-RAS model HDR created was intended to duplicate the WRC Model 2. The results between the duplicated HEC-RAS model and the output from the WRC report were compared. The results agreed and the differences are within 0.01 feet. Some modeling detail notes include:

- Manning's *n* values were kept the same as in the effective FEMA model (overbank=0.075, channel=0.04).
- Ineffective flow areas were added to cross-sections as needed.
- The bridges were modeled using the Highest Energy Answer for low flow and the pressure/weir option for high flow.
- The downstream boundary condition used known water surface, it was kept from the HEC-2 model.
- The model was run under subcritical flow conditions.
- Note that the water surface just upstream of Bridge 3.4 is approximately 4 feet higher than the Duplicated Effective model, and it dissipates upstream of Bridge 3.4. The discrepancy is due to the HEC2 and HEC-RAS program.

- Note that several cross sections downstream of Bridge 3.4 and one cross section upstream do not have enough ground geometry to contain the water in the cross section. Geometry revisions were not made to these cross sections.

4.2.4 Existing Conditions Model (HEC-RAS)

WRC completed survey and as-built plans review for Bridge 3.4. The actual pier width is 6.5 feet compared to 7.6 feet used in WRC Model 2 and in the Corrected Effective HEC-RAS model. The pier width was adjusted to 6.5 feet and this revised model was named the Existing Conditions Model. The pier width for Orange Show Rd and Tippecanoe Ave Bridge were not changed. The actual pier width for Orange Show Rd Bridge and Tippecanoe Ave Bridge is 1.6 feet. Considering 2 feet debris on each side of the pier, the resulting pier width is approximately the same as in WRC Model 2. The Existing Conditions Model was used to evaluate the hydraulics for the existing and proposed conditions. In summary:

- Existing bridge geometry was kept the same for all bridges, except the pier width was for Bridge 3.4 was corrected to 6.5 feet per WRC survey/as-built review.

- Per the discussion in the FIS, the Santa Ana River has medium debris potential. Since Bridge 3.4 pier size is over six feet, pier debris accumulation was not applied following typical procedures used by the Los Angeles District USACE.

4.2.5 Proposed Condition Bridge Model (HEC-RAS)

Proposed condition channel geometry and modeling approach for Bridge 3.4 are identical to the existing conditions bridge model for all cross sections outside of the bridge area. A total of two bridge alternatives were analyzed. The alternatives were taken from the design plans. Bridge alternative plans can be found at Exhibit 5. The model was modified as following:

- Two alternatives were proposed for Bridge 3.4 replacement. Proposed conditions for Bridge 3.4 were taken from the design plans.
- For Alternative 1, the proposed design includes a W40X431 steel beam with five piers. The total span is 363.5 feet. The abutments were assumed to be sloped at a 2:1 inclination to meet grade at the channel bottom. Bridge profile was assumed to be 5.775' steel beam with concrete tie, subgrade and rails.
- For Alternative 2, the proposed design includes a W21X62 steel beam with three piers. The total span is 360.2 feet. The abutments were assumed to be sloped at a 2:1 inclination to meet grade at the channel bottom. Bridge profile was assumed to be 4.271' steel beam with concrete tie, subgrade and rails.
- The proposed condition survey was based on NAVD 88 vertical datum. The Corpscon program was used to convert elevations in NAVD 88 to NGVD 29. The conversion relationship of NAVD 88 – NGVD 29 = 2.5 feet was used based on the proposed bridge location (N34.07515, W117.2721).

4.3 Model Results

Table 3 shows the Existing Conditions Model hydraulic results for Cross Section 28.62 upstream of Bridge 3.4. Figure 3 shows the profile of the existing AT&SF Bridge. Figure 4 shows the cross section view of the existing Bridge 3.4 and Figure 5 shows the cross-section view of the Alternative 1 bridge. The Alternative 2 bridge is generally similar to Alternative 1. The model exhibits for the existing and proposed condition profile and cross sections can be found in Attachment 1.

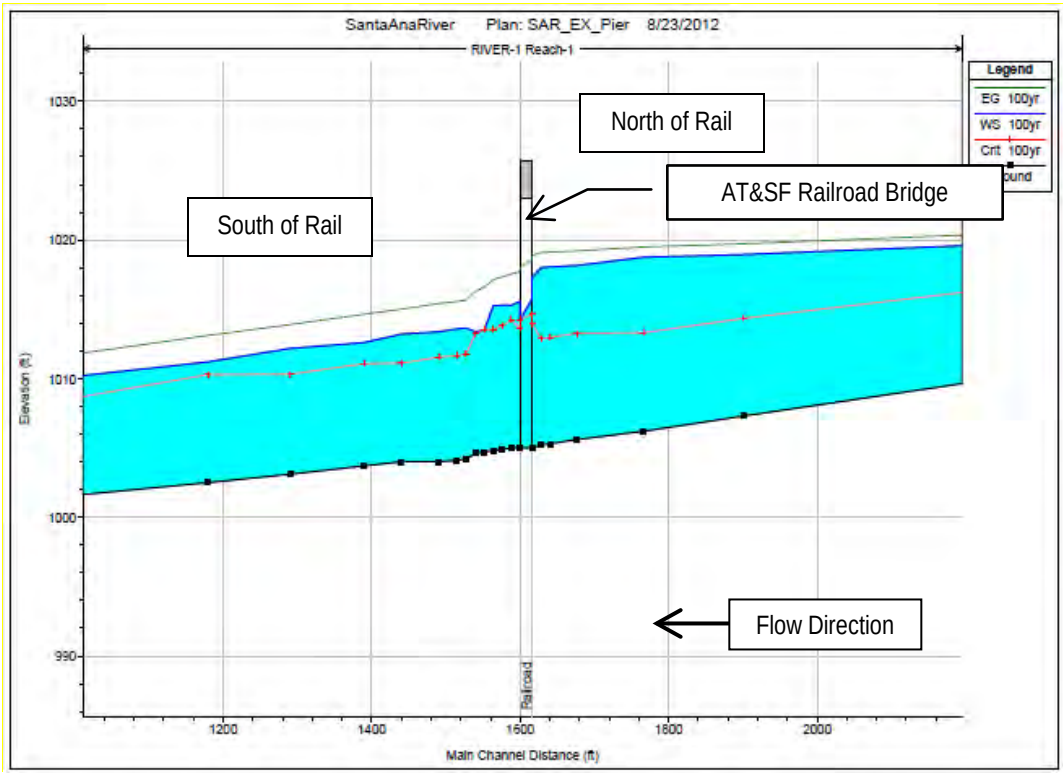
Table 3: Existing Conditions Model Results for Cross-Section 28.62 (Upstream of Bridge 3.4)

	100-Year
WSE	1017.29 ft
EGL	1018.86 ft
VCH	10.07 ft/s
WSE = water surface elevation, EGL = energy grade line elevation, VCH = main channel average velocity. All elevations are NGVD 1929.	

The results obtained from 100-year flow rate analysis of Bridge 3.4 are shown in Table 4. Full hydraulic model results are shown in Attachment 2 (Hydraulic Analysis Results).

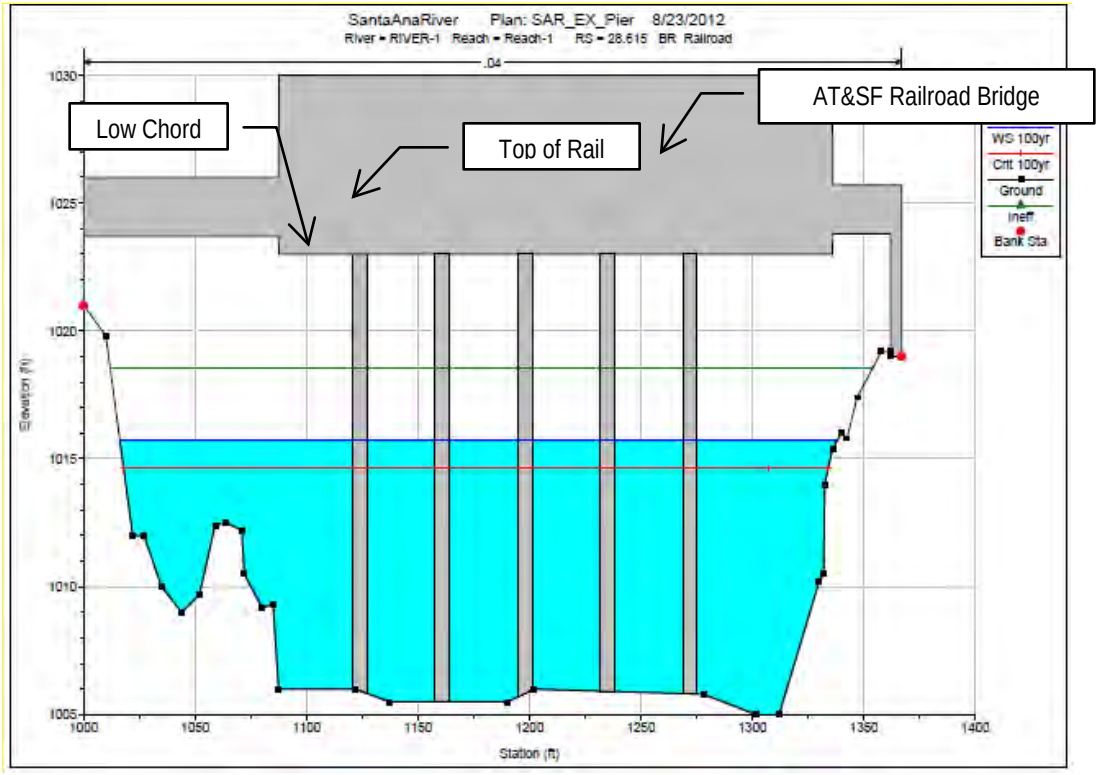
Table 4: AT&SF Bridge 3.4 (28.615) Hydraulic Results

		Existing Bridge	**Alternative 1**	**Alternative 2**
100-Yr event	WSE	1017.3 ft	1017.0 ft	1016.5 ft
	EGL	1018.9 ft	1018.3 ft	1017.9 ft
	Velocity	15.6 ft/s	11.7 ft/s	11.3 ft/s
	Froude #	0.82	0.68	0.65
WSE = water surface elevation; EGL = energy grade line elevation; VCH = main channel average velocity; All elevations are NGVD 1929.				



EG = energy grade line (ft), WS = water surface (ft), yr = year

Figure 3: Profile of Existing Condition



EG = energy grade line (ft), WS = water surface (ft), yr = year

Figure 4: Cross-Section of Existing Conditions Upstream of Bridge 3.4

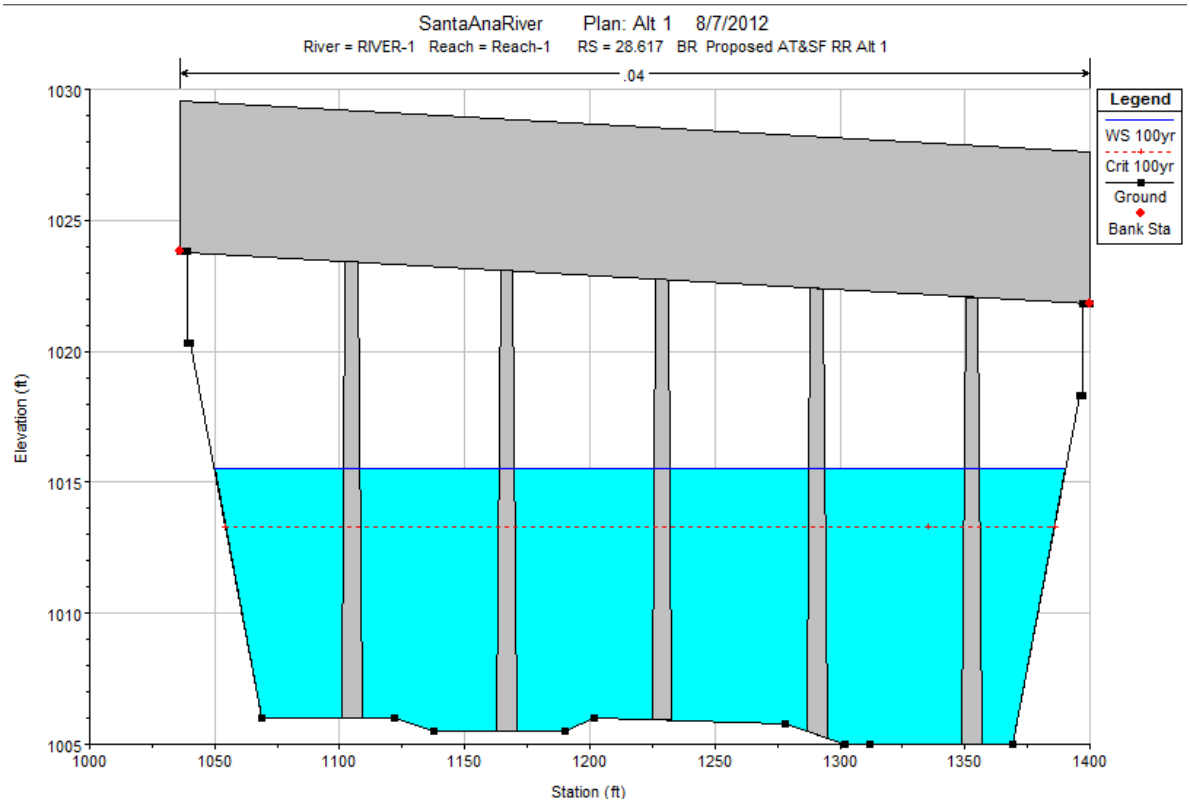


Figure 5: Cross-Section of Proposed Conditions Upstream Face of Bridge 3.4 (Alt 1)

The freeboard criteria selected for the bridge (in the following priority) are presented below in Table 5 and Table 6 for Alternative 1 and Alternative 2, respectively. Meeting 100 year criteria and therefore meeting 50-year by default. The alternatives meet all criteria.

Table 5: Hydraulic Freeboard Criteria (Alternative 1)

Criterion	Standard	Proposed Model Results	Criterion Met?
1. 100-yr WSE < Low Chord	Low Chord = 1021.81	100-yr WSE = 1017.0	Yes
2. 100-yr EGL < Top of SBGD	Top of SBGD = 1025.08	100-yr EGL = 1018.31	Yes
3. Proposed WSE ≤ Existing WSE	Existing 100-yr WSE = 1017.3	Proposed 100-yr WSE = 1017.0	Yes
WSE = water surface elevation (ft); EGL = energy grade line elevation (ft); SBGD = subgrade. All elevations are NGVD 1929.			

Table 6: Hydraulic Freeboard Criteria (Alternative 2)

Criterion	Standard	Proposed Model Results	Criterion Met?
1. 100-yr WSE < Low Chord	Low Chord = 1023.23	100-yr WSE = 1016.5	Yes
2. 100-yr EGL < Top of SBGD	Top of SBGD = 1025	100-yr EGL = 1017.91	Yes
3. Proposed WSE ≤ Existing WSE	Existing 100-yr WSE = 1017.3	Proposed 100-yr WSE = 1016.5	Yes
WSE = water surface elevation (ft); EGL = energy grade line elevation (ft); SBGD = subgrade. All elevations are NGVD 1929.			

The results of the hydraulic analysis upstream and downstream of the Bridge 3.4 are shown in Table 7. For Alternative 1 and 2, it shows no rise in the study reach.

Table 7: Hydraulic Analysis Results (ft, NGVD29)

River Station	*FEMA Effective*	*Corrected Effective*	*Revised Existing*	*Proposed Alt1*	*Proposed Alt2*	*Alt1-Existing*	*Alt2-Existing*
29.01	1025.27	1025.01	1025.01	1025.01	1025.01	0	0
28.95	1024.34	1023.97	1023.97	1023.97	1023.97	0	0
28.84	1023.16	1021.56	1021.52	1021.40	1021.38	-0.12	-0.14
28.737	1022.57	1019.80	1019.68	1019.14	1018.93	-0.54	-0.75
28.673	1022.27	1019.11	1018.95	1018.18	1017.83	-0.77	-1.12
28.647	1022.18	1018.92	1018.75	1017.92	1017.54	-0.83	-1.21
28.63	1021.92	1018.36	1018.16	1017.13	1016.6	-1.03	-1.56
28.624	1021.84	1018.26	1018.05	1017.00	1016.46	-1.05	-1.59
28.622	1021.81	1018.22	1018.01				
28.62	1021.63	1017.57	1017.29				
28.615			Railroad Bridge				
28.61	1015.58	1015.58	1015.58				
28.608	1015.30	1015.28	1015.28	1015.28	1015.28	0	0
28.606	1015.32	1015.29	1015.29	1015.29	1015.29	0	0
28.604	1015.30	1015.27	1015.27	1015.27	1015.27	0	0
28.602	1013.49	1013.52	1013.52	1013.52	1013.52	0	0
28.6	1013.41	1013.38	1013.38	1013.38	1013.38	0	0
28.597	1013.67	1013.65	1013.65	1013.65	1013.65	0	0
28.595	1013.61	1013.59	1013.59	1013.59	1013.59	0	0
28.59	1013.38	1013.37	1013.37	1013.37	1013.37	0	0
28.58	1013.22	1013.21	1013.21	1013.21	1013.21	0	0

5. Conclusions

Using the data and resources available, the hydraulic conditions for both existing and proposed conditions were modeled for Bridge 3.4. The results of the modeling indicate that the proposed

bridge improvements result in a slightly lower water surface and velocity; the proposed bridge will meet freeboard criteria. A draft FEMA "No-Rise" Certificate was completed for the proposed bridge. It will be finalized after the preferred alternative is selected.

6. References

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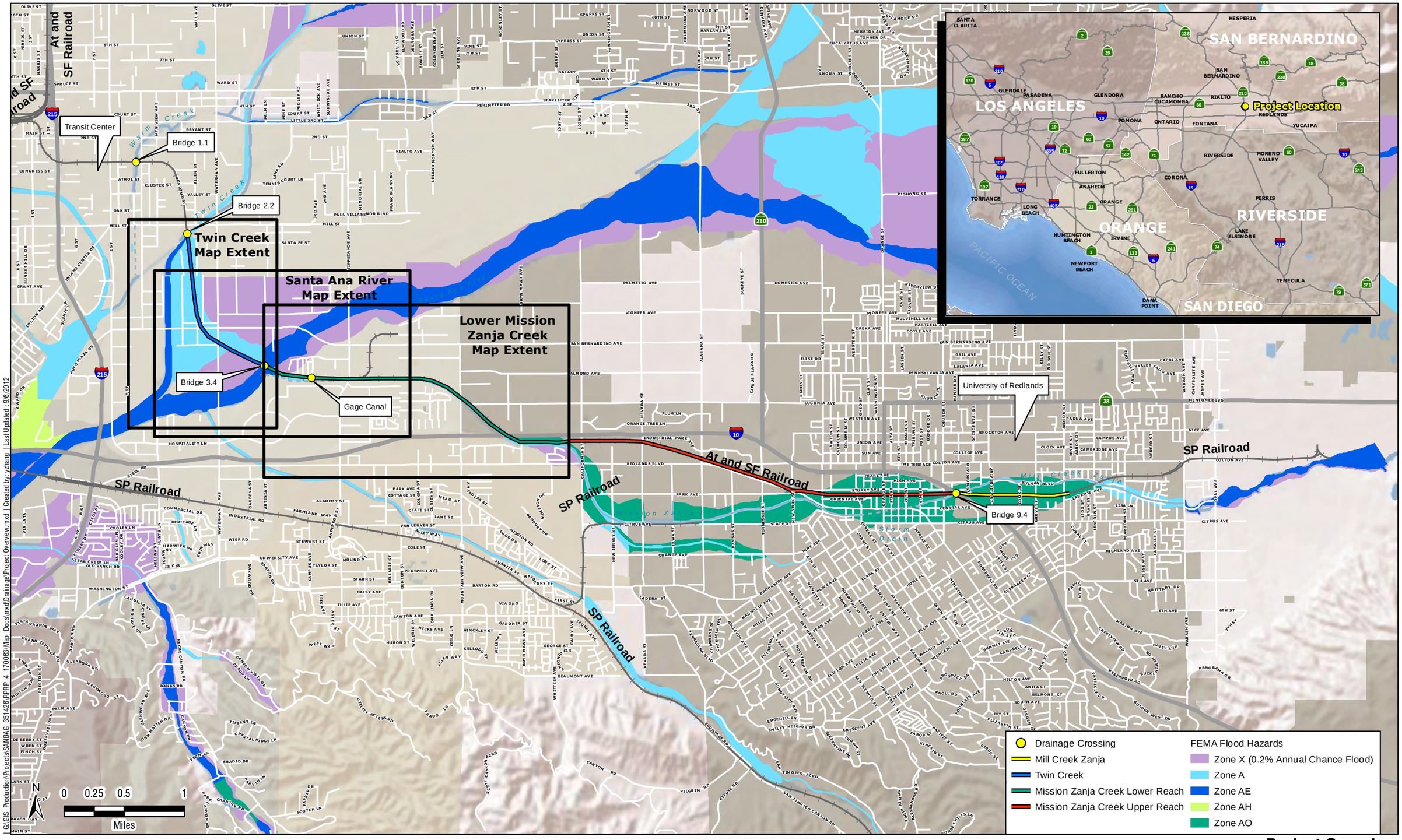
U.S. Army Corps of Engineers. 2010. HEC-RAS v.4.1 User's Manual and Technical Reference Manual

WRC Consulting Services, Inc. 2003. Santa Ana River Trail, Alabama Street to Waterman Avenue, Hydraulic Design and Analysis.

Exhibit 1: RPRP Project Overview



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HDR ONE COMPANY | *Many Solutions*™

Project Overview

EXHIBIT 1

SANBAG | Redlands Passenger Rail Project | Hydraulic Impact Report

Exhibit 2: Santa Ana River Reach Limits

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Santa Ana River

EXHIBIT 2

SANBAG | Redlands Passenger Rail Project | Santa Ana River Report

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Exhibit 3: Modeling Overview–Cross-Sections

Exhibit 3 – Modeling Overview – Cross Sections

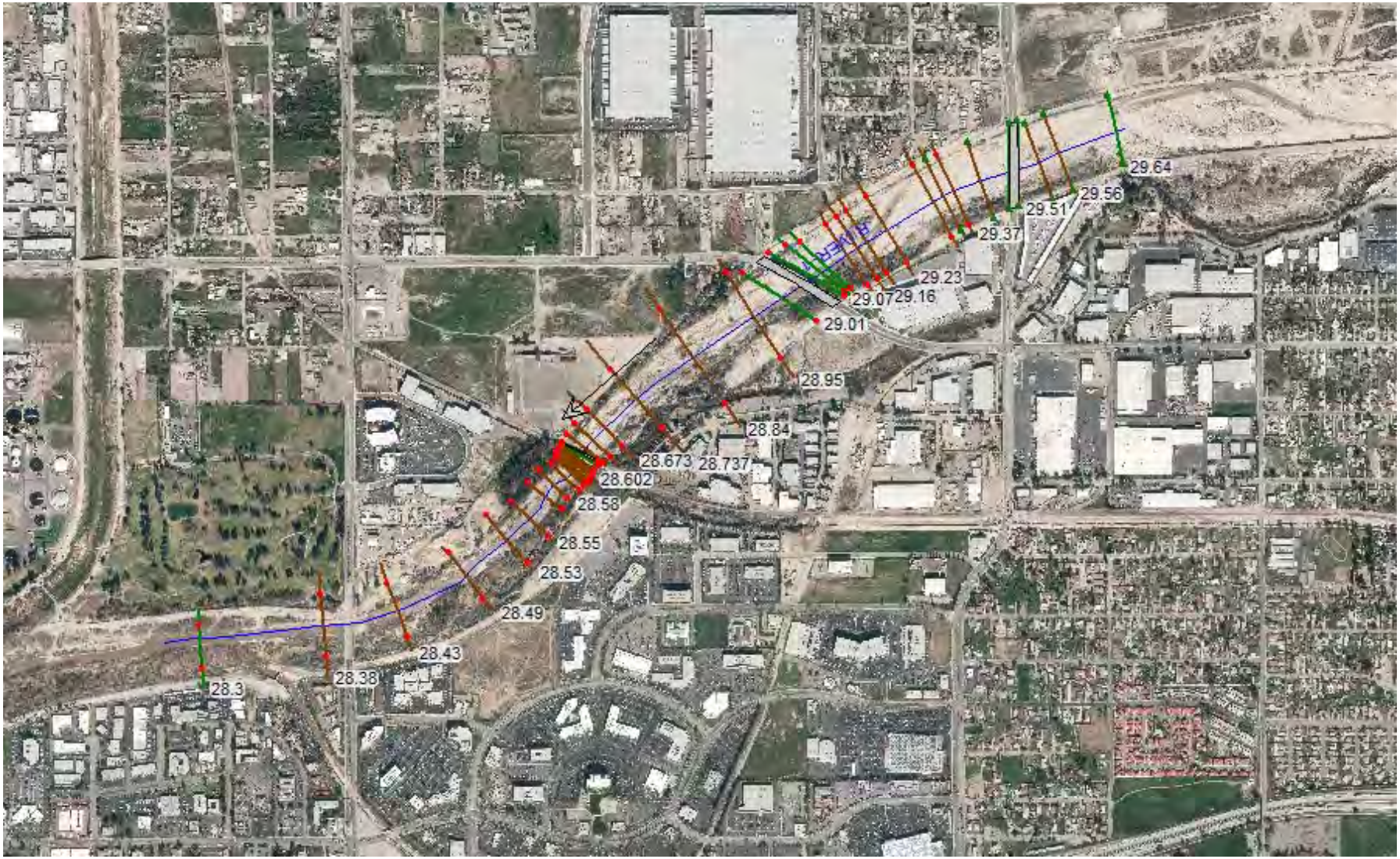
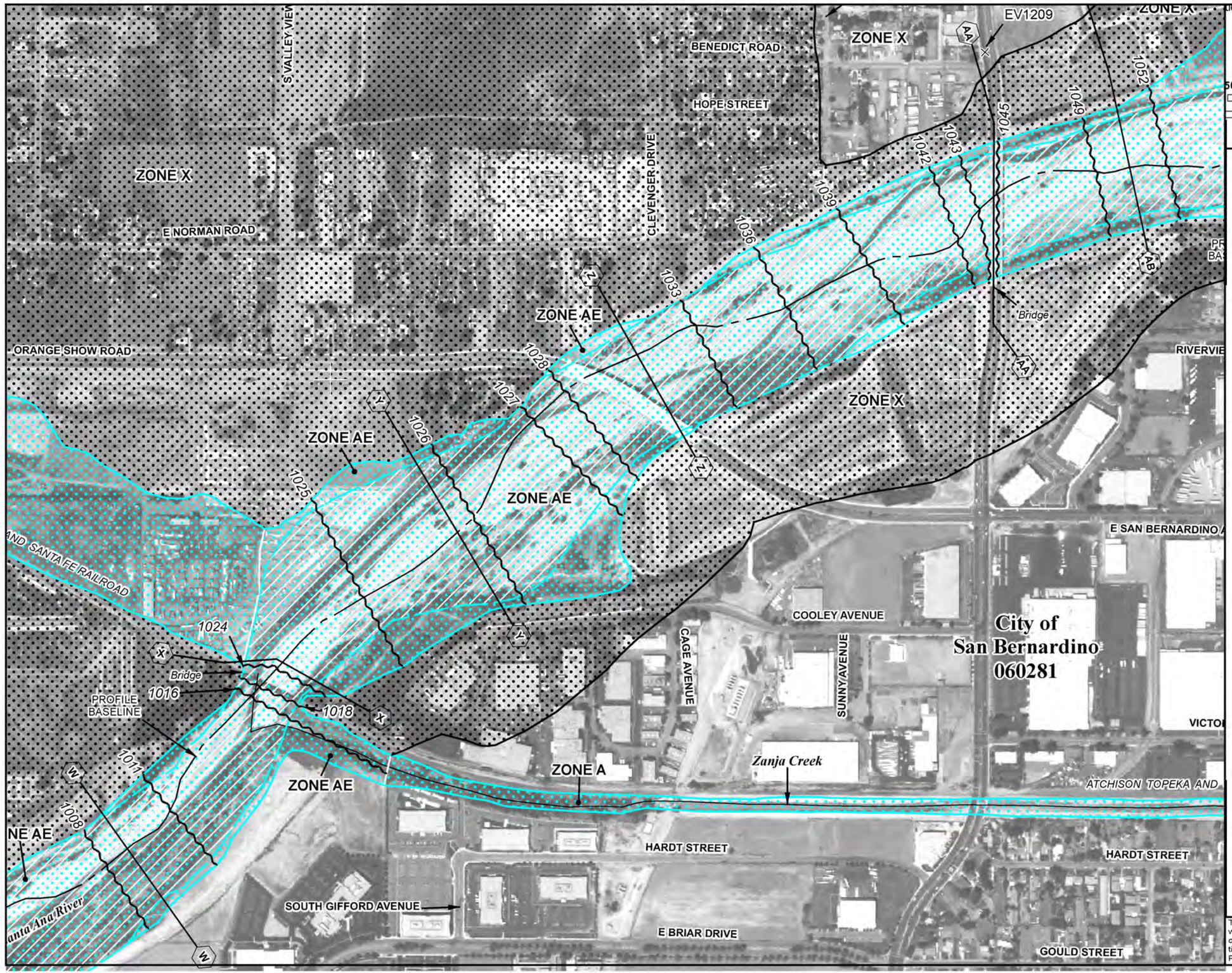


Exhibit 4: FEMA FIRM 06071C Panel 8684H



MAP SCALE 1" = 500'

50 0 500 1000

FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 8684H

FIRM

FLOOD INSURANCE RATE MAP

SAN BERNARDINO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 8684 OF 9400

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LOMA LINDA, CITY OF	065042	8684	H
SAN BERNARDINO, CITY OF	060281	8684	H

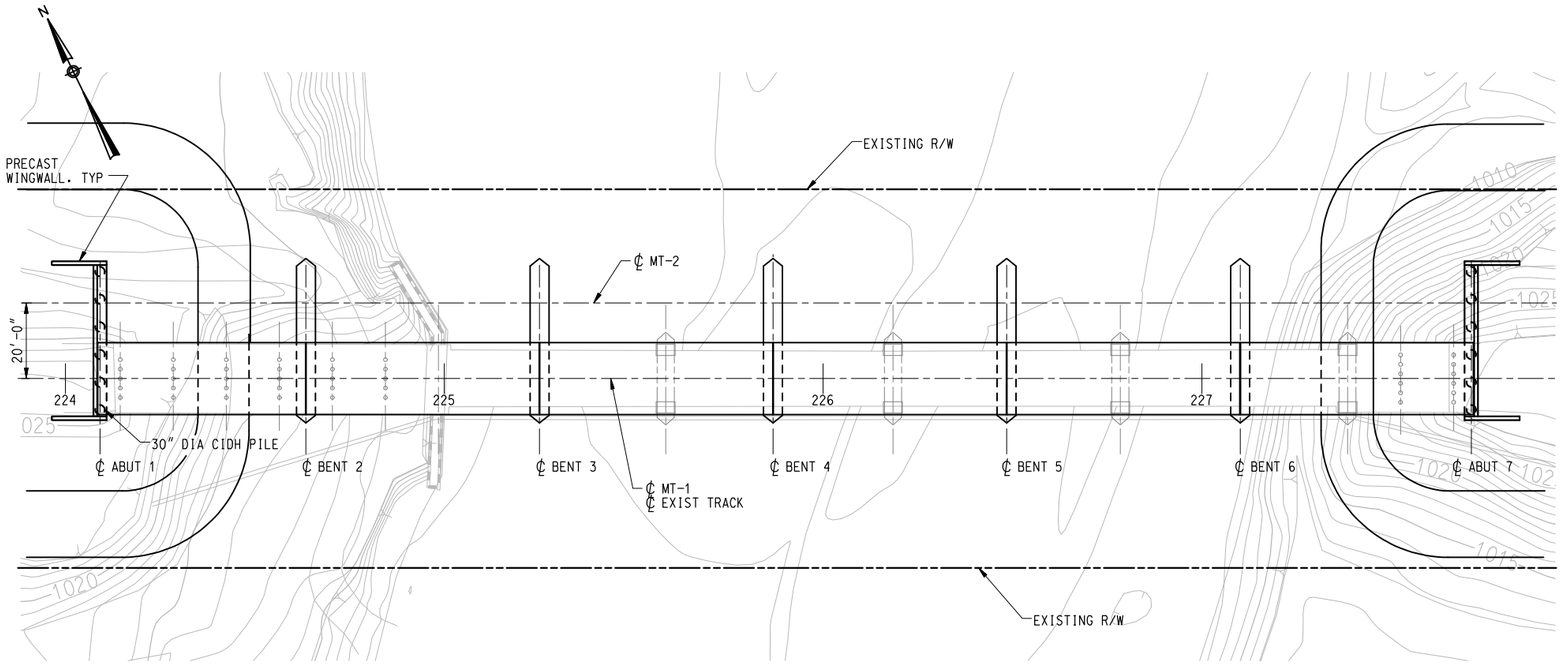
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06071C8684H

MAP REVISED
AUGUST 28, 2008

Federal Emergency Management Agency

Exhibit 5: Proposed Bridge Alternative Plans



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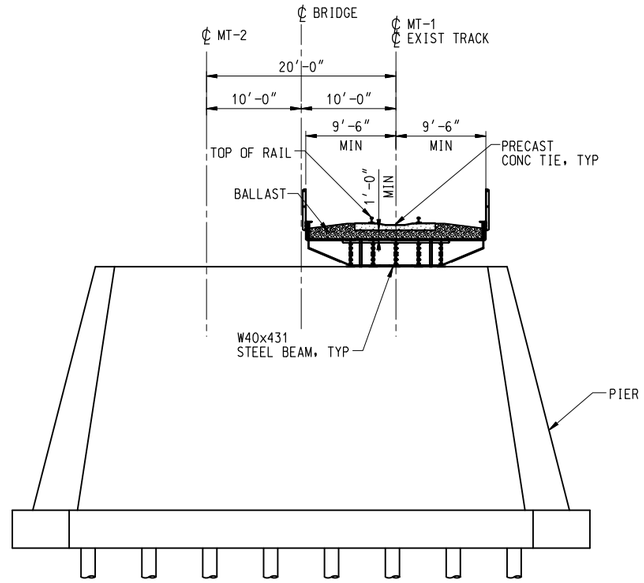

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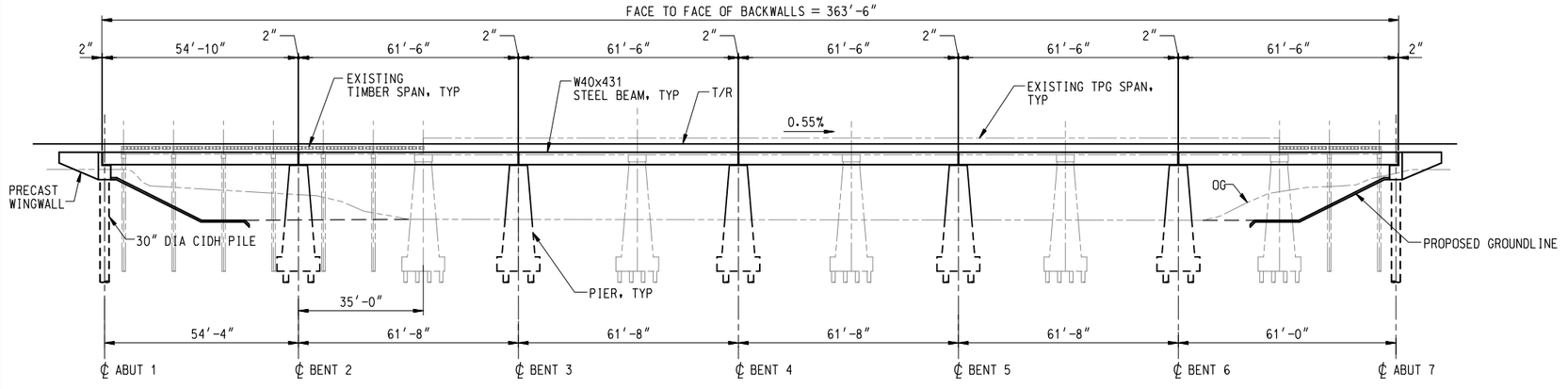

ELEVATION
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LEGEND

EXISTING STRUCTURE

NEW STRUCTURE

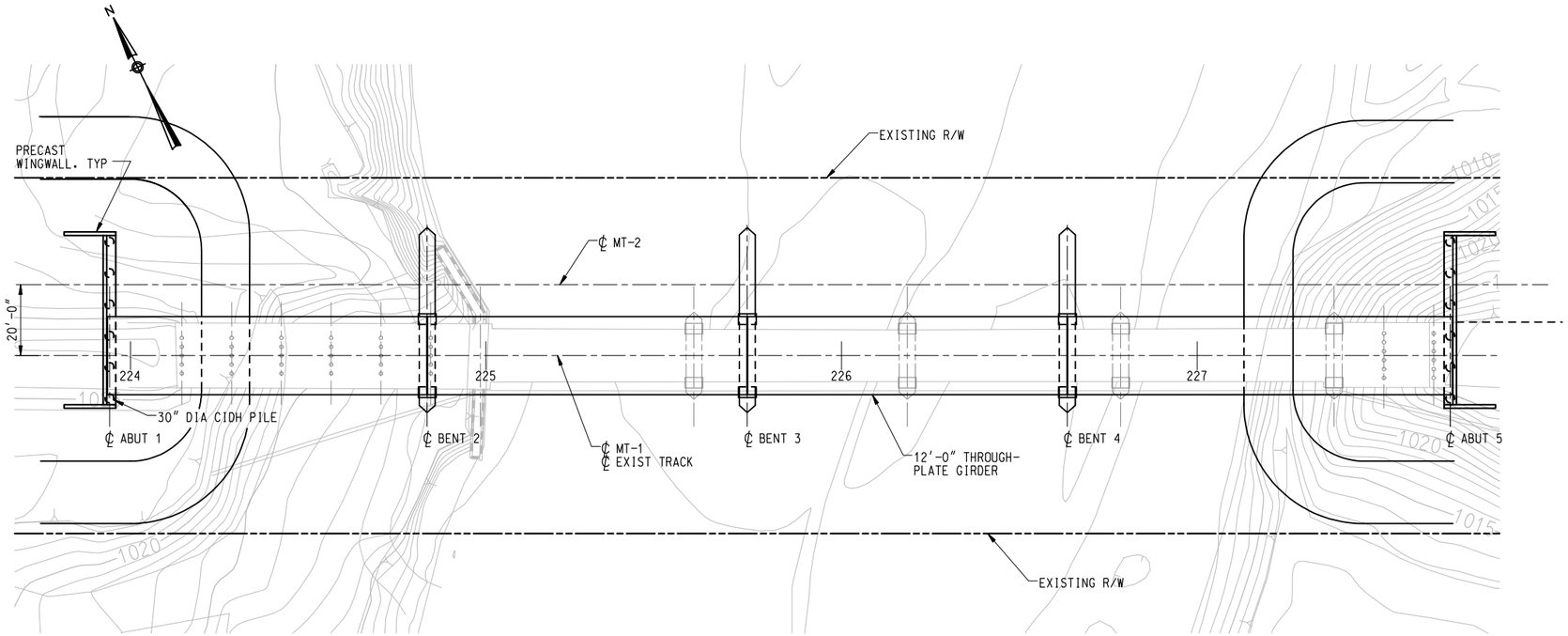
HDR Engineering, Inc. — ONE COMPANY *Many Solutions* — 3230 El Camino Real, Suite 200 Irvine, CA 92602

Governments SANBAG Working Together

SAN BERNARDINO ASSOCIATED GOVERNMENTS
REDLANDS PASSENGER RAIL PROJECT
BRIDGE 3.4
ALTERNATIVE 1

SCALE: AS NOTED

DATE:



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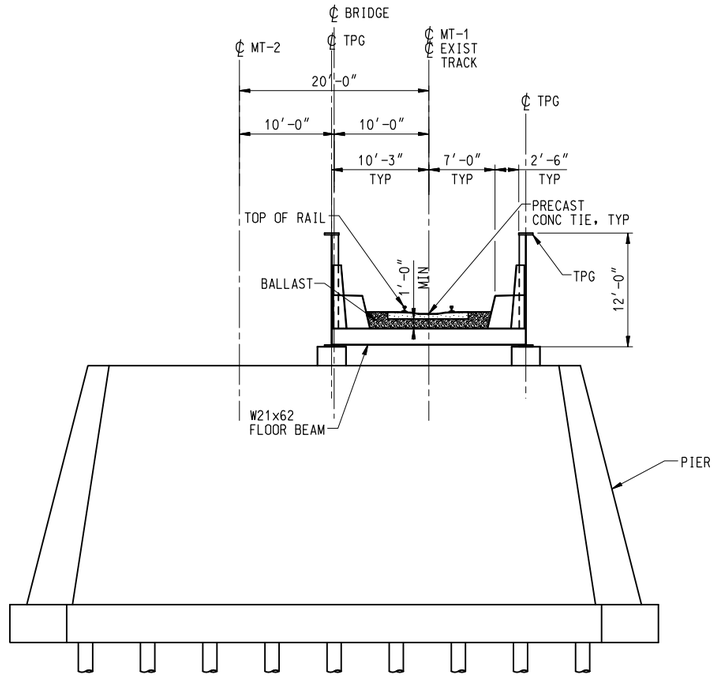

TYPICAL SECTION

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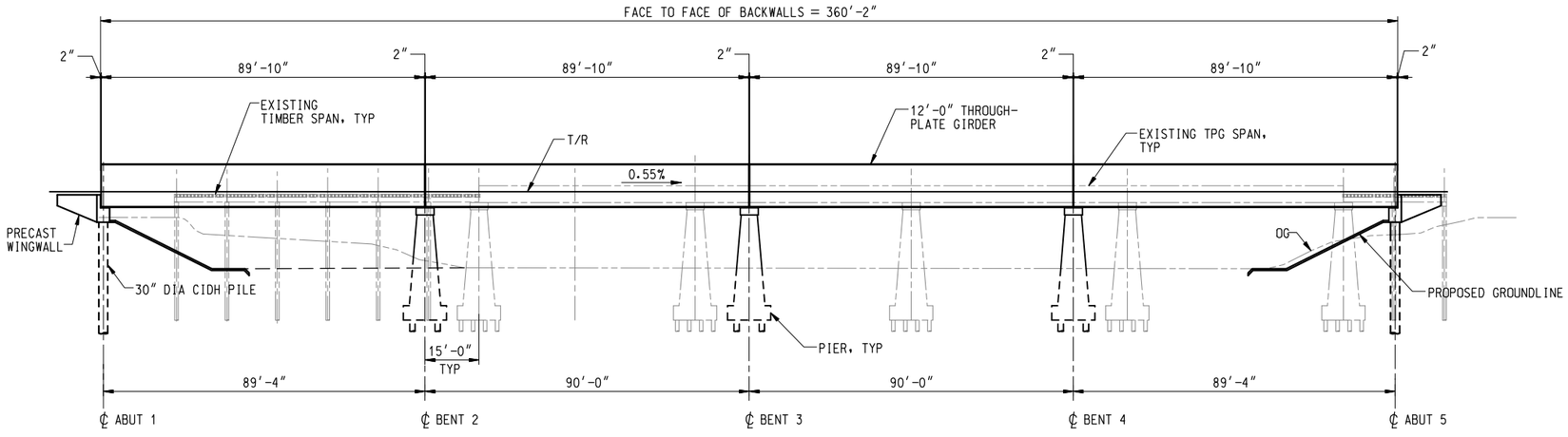

ELEVATION

SCALE: 1"=40'-0"

LEGEND

EXISTING STRUCTURE

NEW STRUCTURE

HDR Engineering, Inc. — ONE COMPANY *Many Solutions* — 3230 El Camino Real, Suite 200 Irvine, CA 92602

Governments SANBAG Working Together

SAN BERNARDINO ASSOCIATED GOVERNMENTS
REDLANDS PASSENGER RAIL PROJECT
BRIDGE 3.4
ALTERNATIVE 2

SCALE: AS NOTED

DATE:

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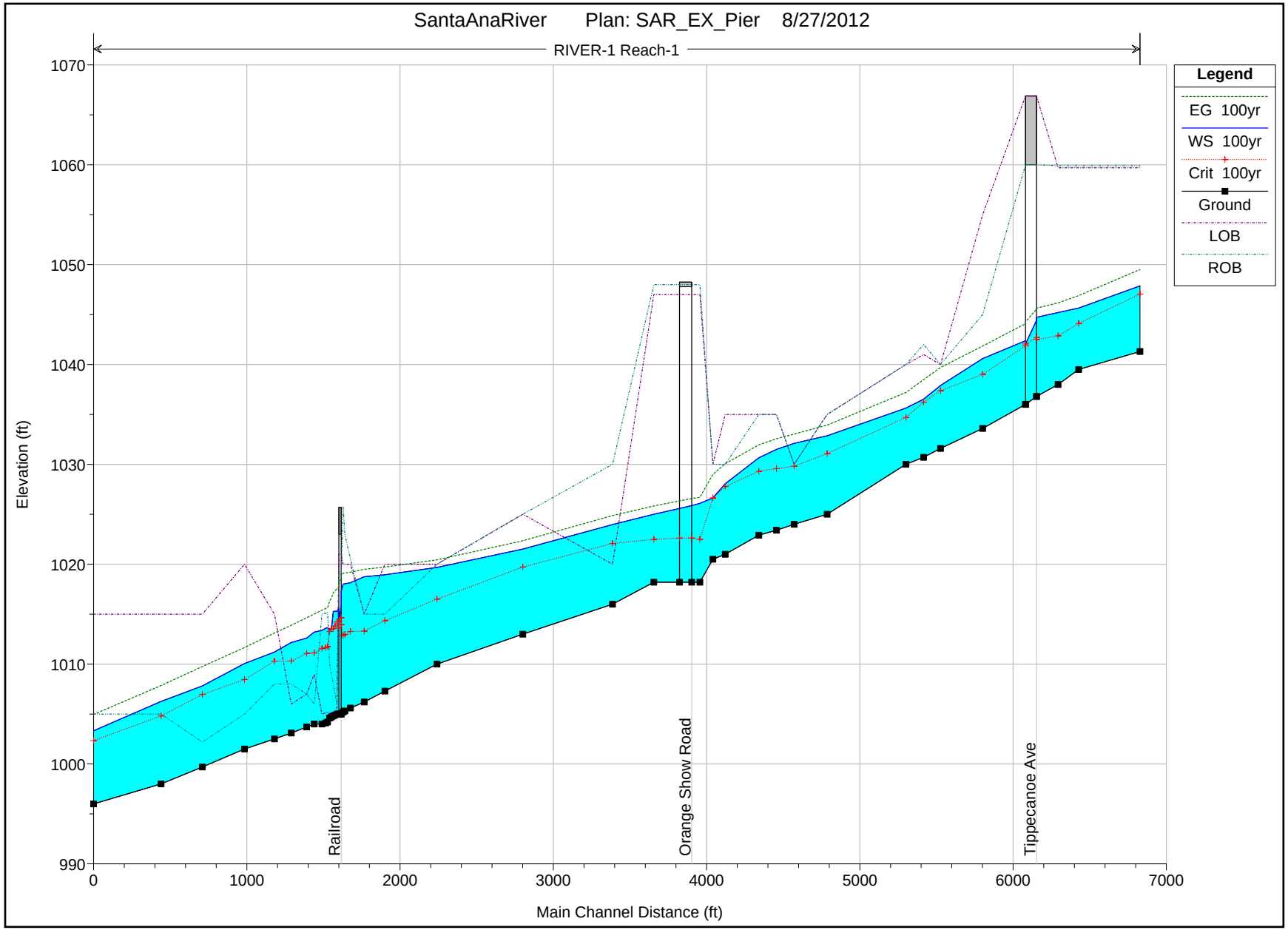
Attachment 1 - HEC-RAS Modeling Exhibits


SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
RIVER-1 Reach-1
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WS 100yr
Crit 100yr
Ground
LOB
ROB
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1070
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1050
1040
1030
1020
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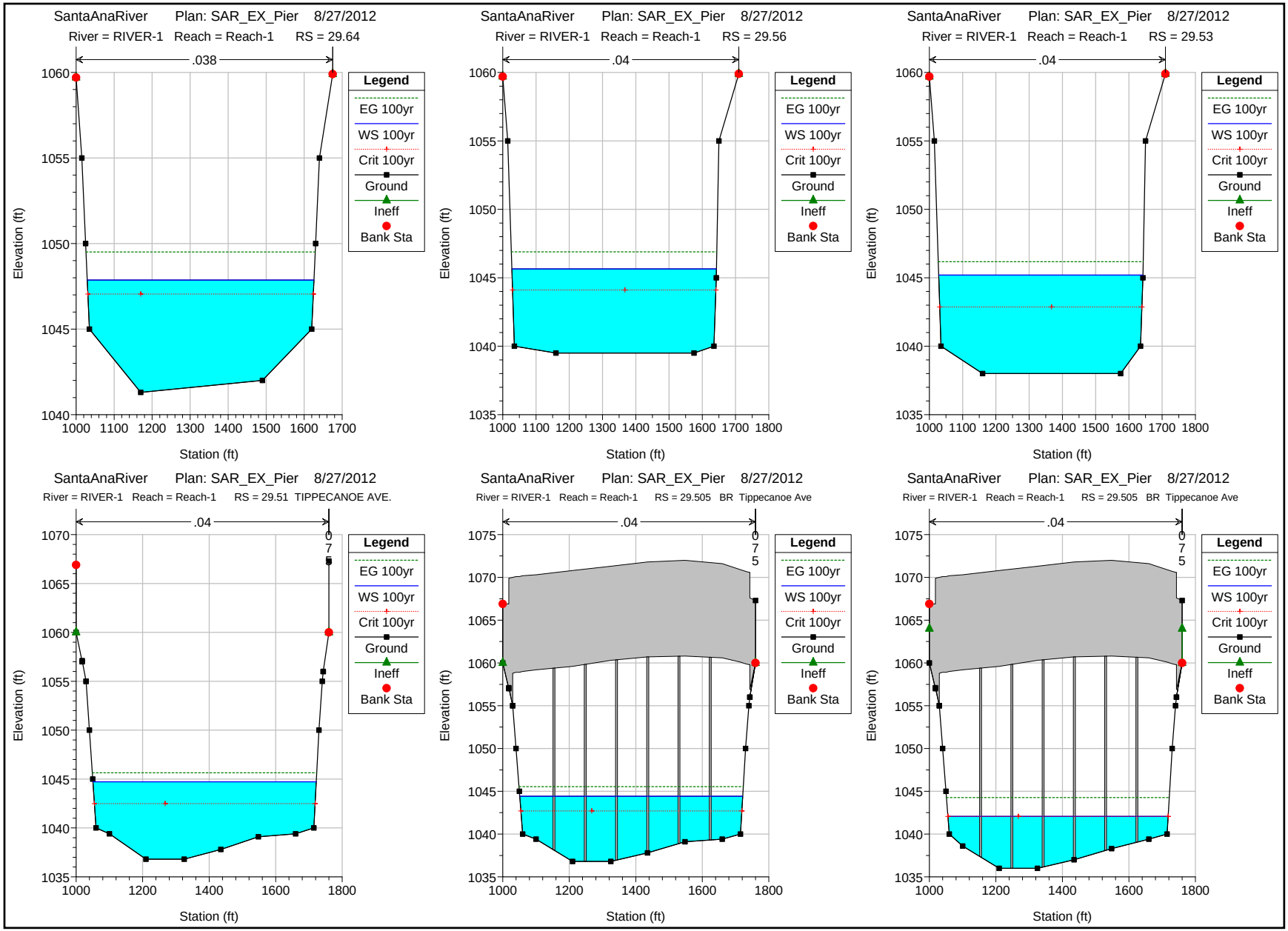
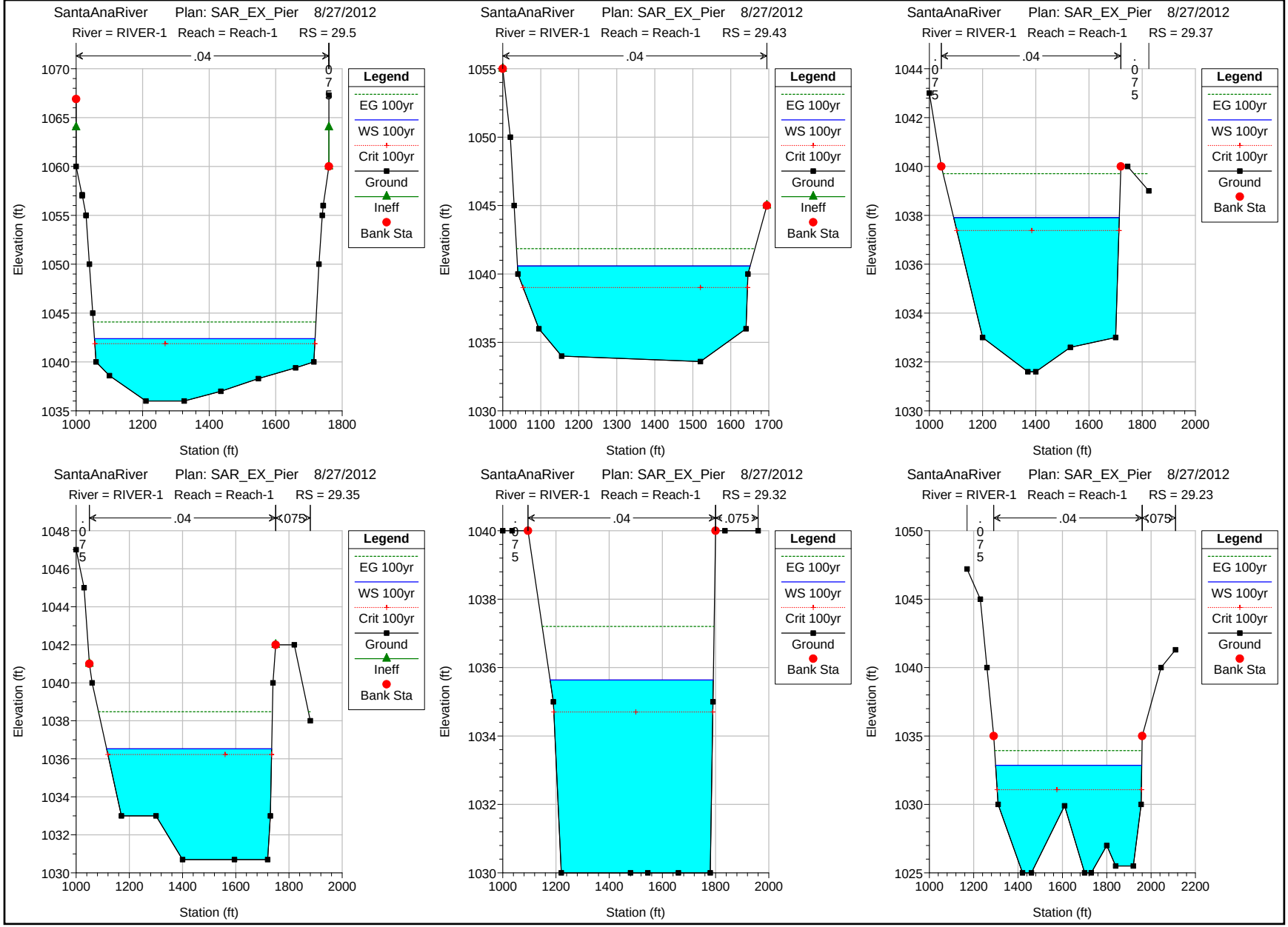
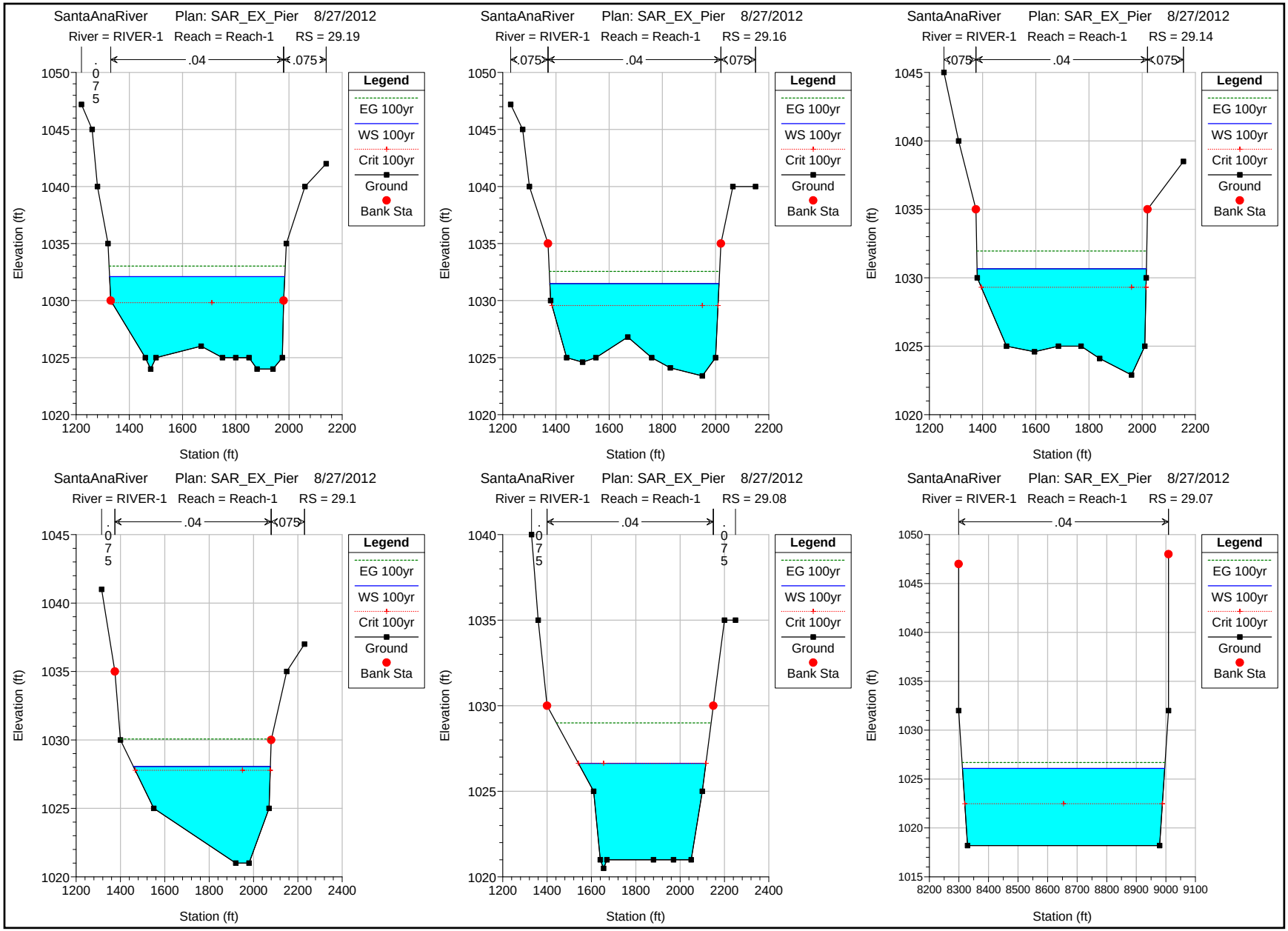
1000
2000
3000
4000
5000
6000
7000
Main Channel Distance (ft)
Railroad
Orange Show Road
Tippecanoe Ave


SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.64
.038
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.56
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.53
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.51 TIPPECANOE AVE.
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.505 BR Tippecanoe Ave
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.505 BR Tippecanoe Ave
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.5
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.43
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.37
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.35
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.32
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.23
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.19
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.16
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.14
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.1
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.08
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.07
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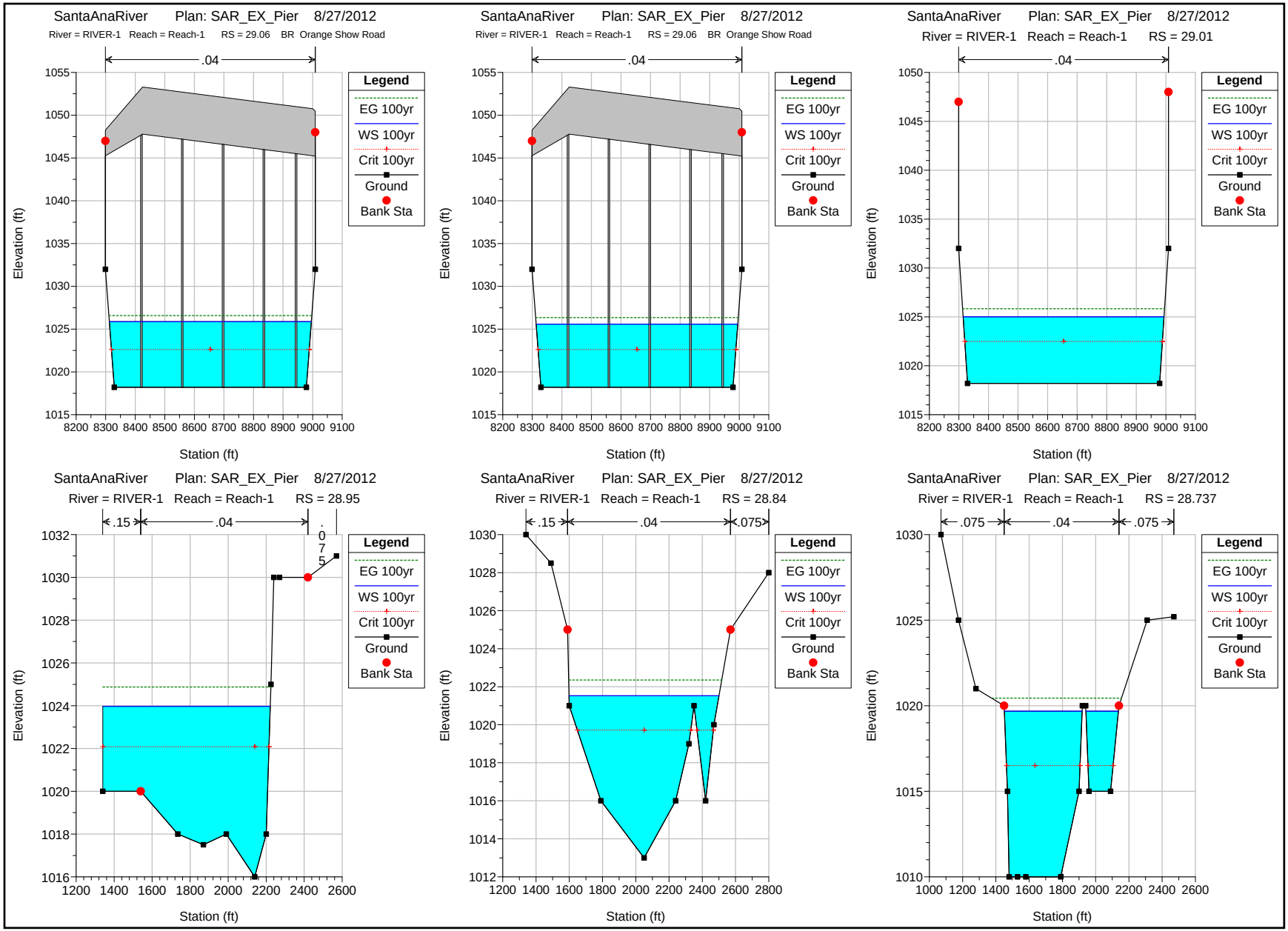
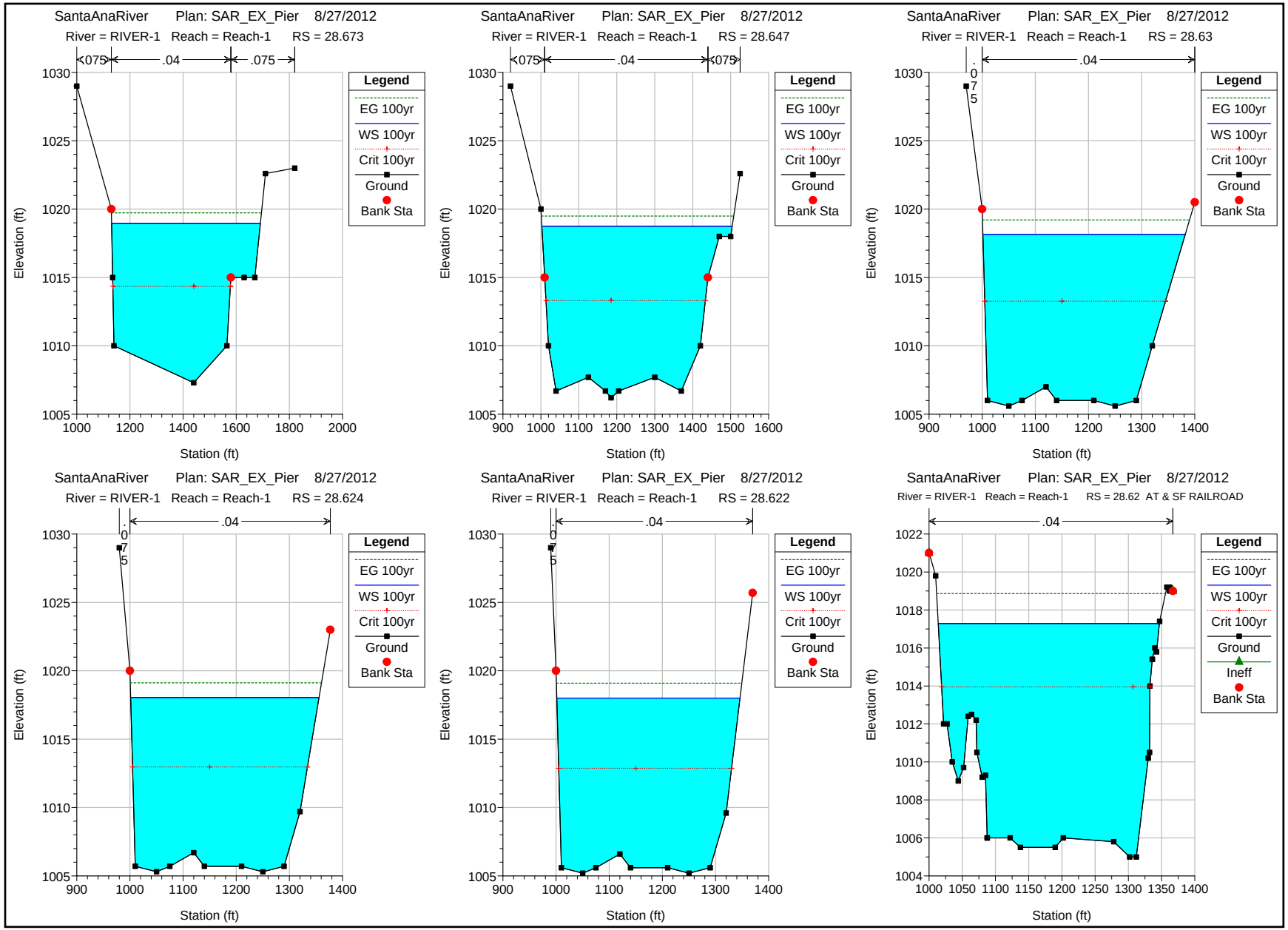
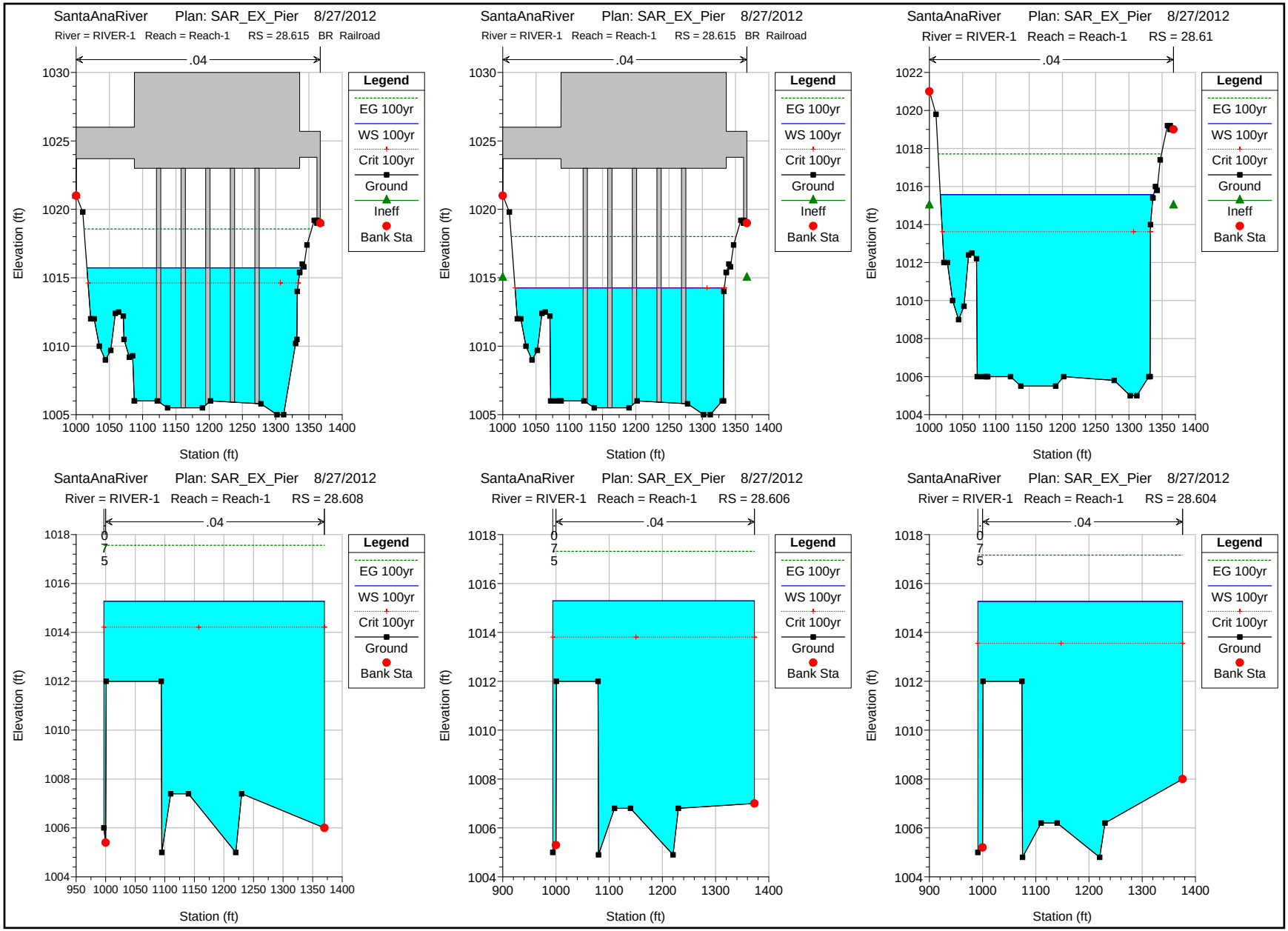
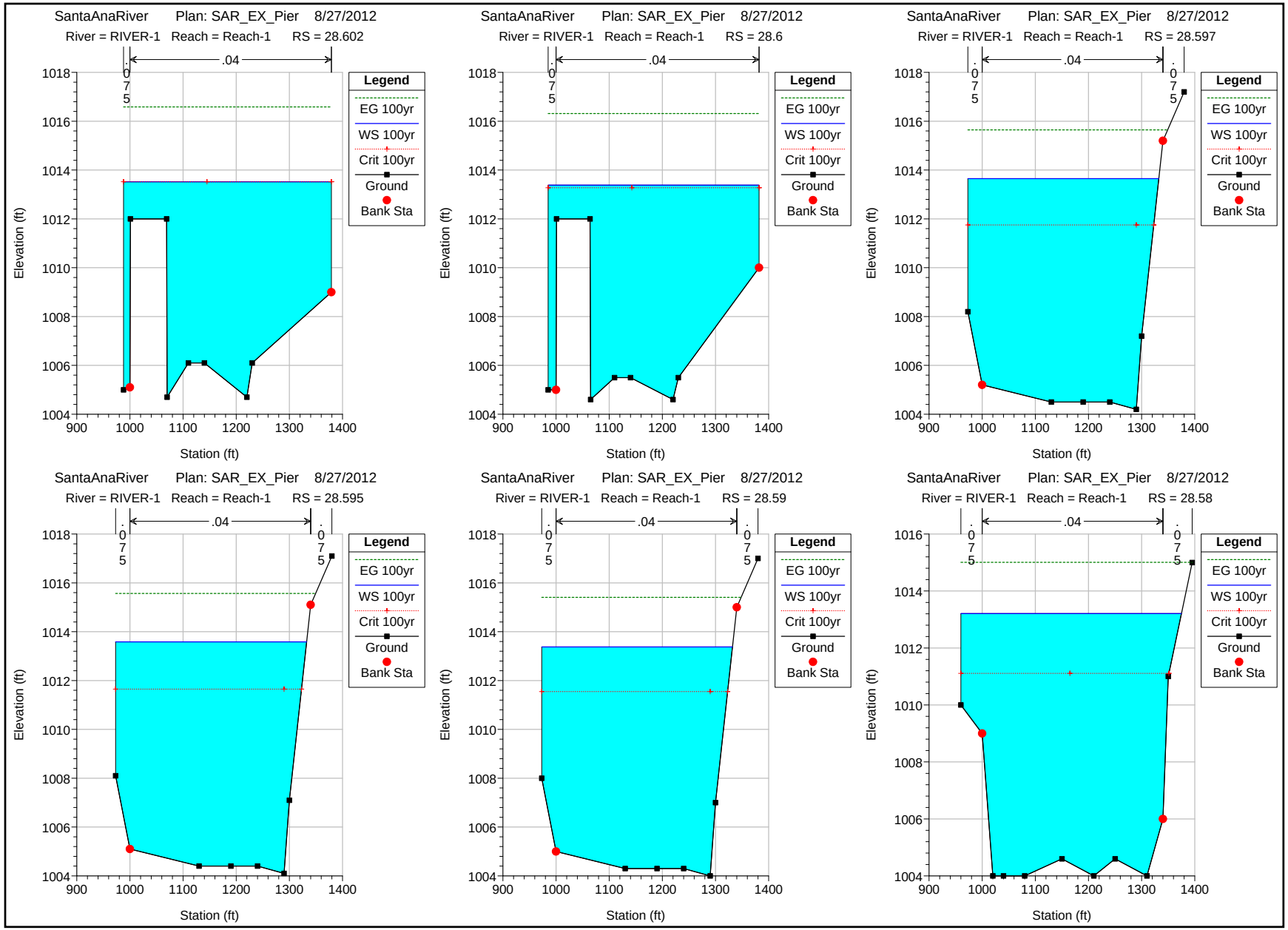
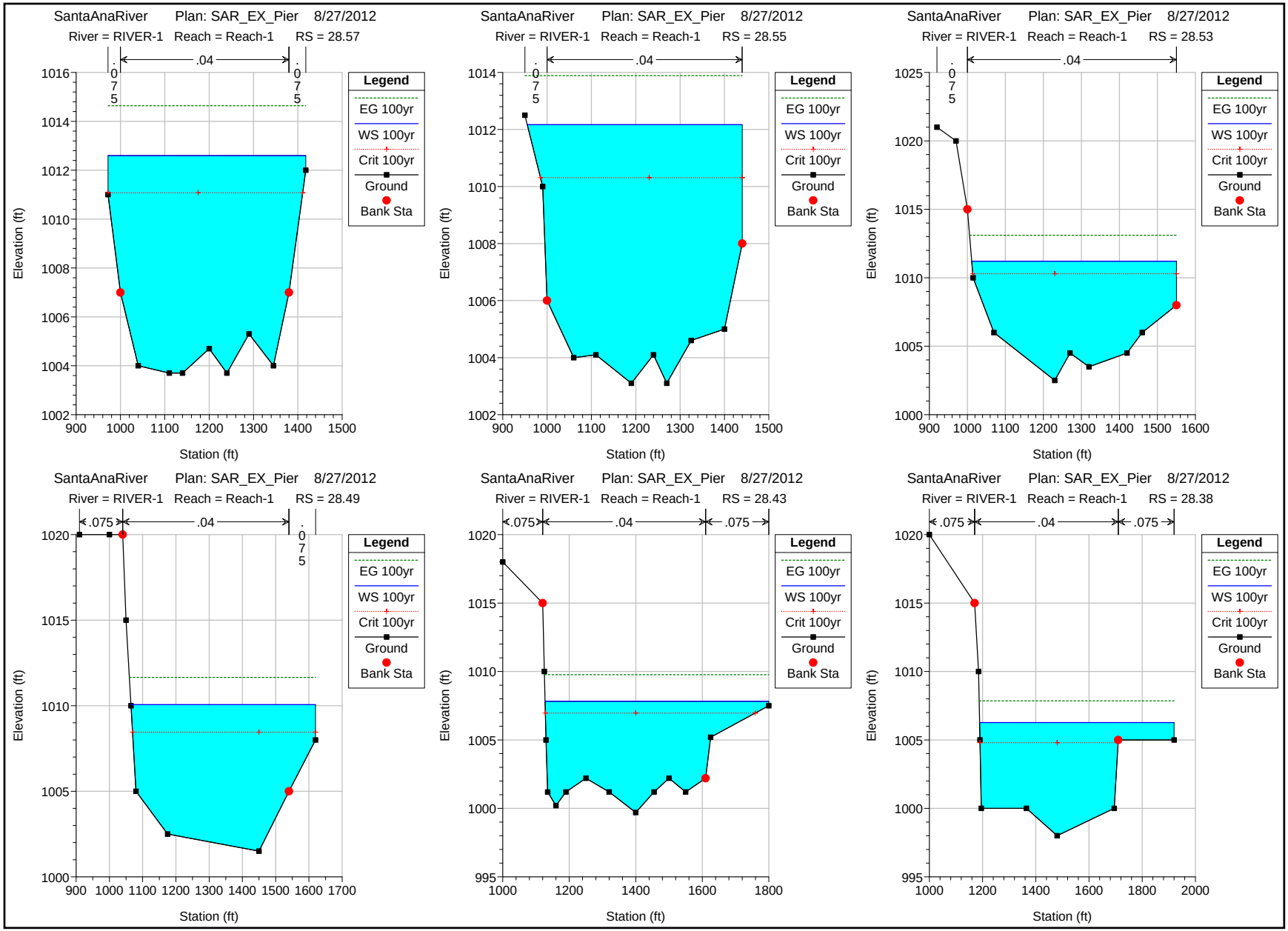
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

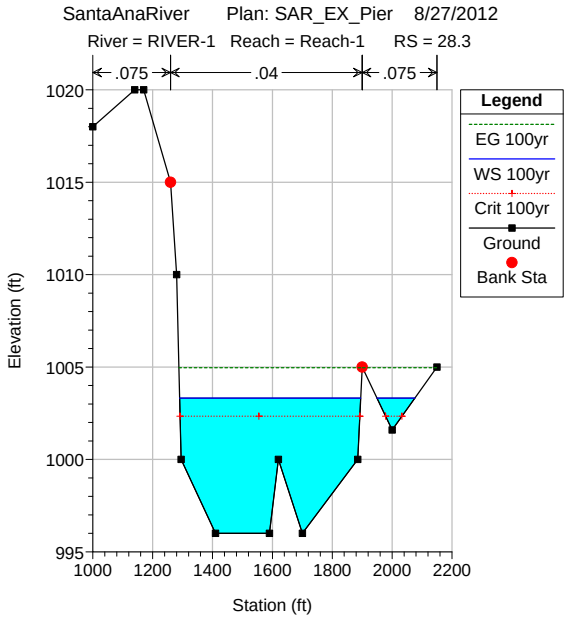

SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.06 BR Orange Show Road
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.06 BR Orange Show Road
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.01
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.95
.15
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.84
.15
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.737
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

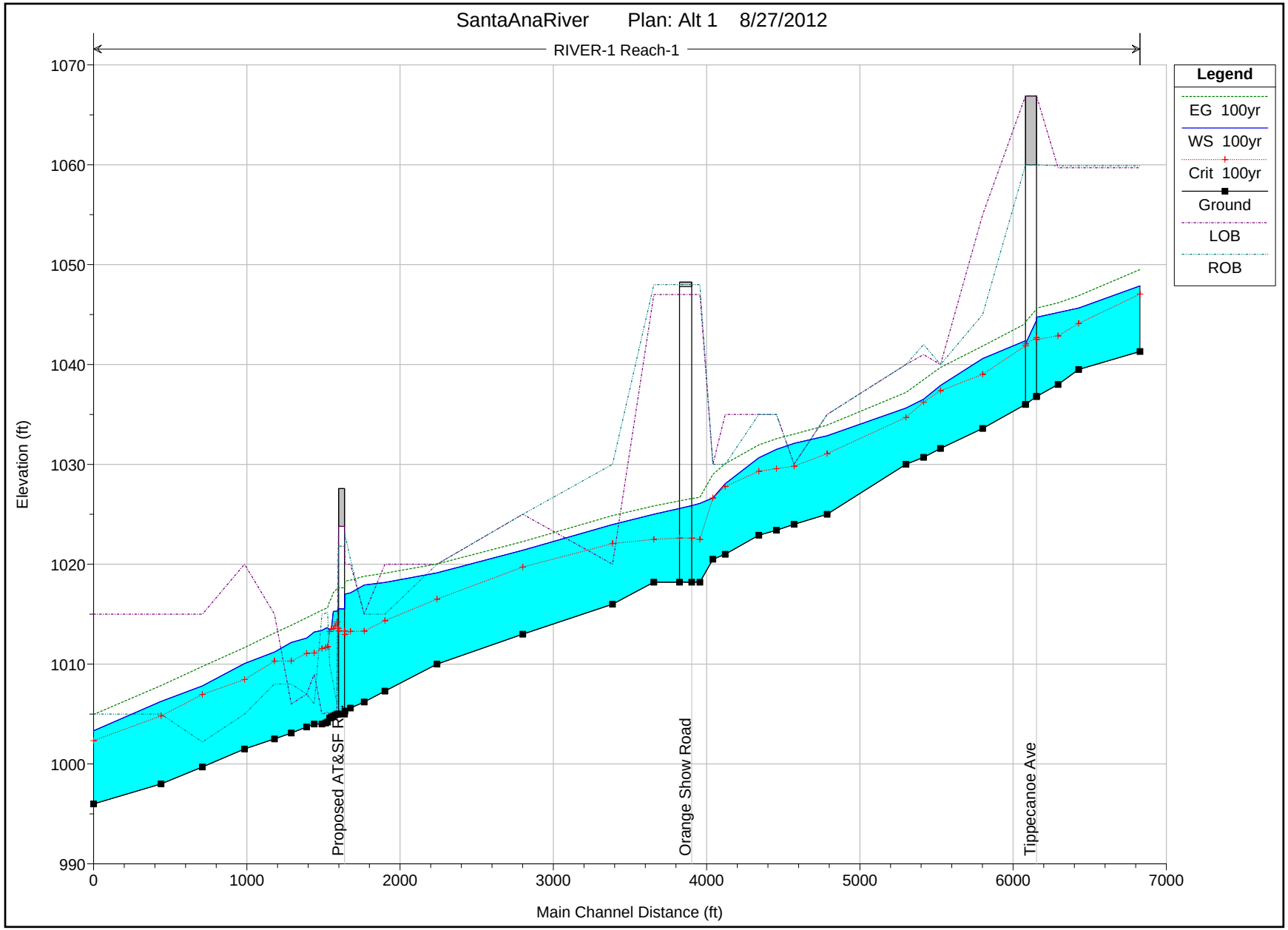

SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.673
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.647
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.63
.075 .04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.624
.075 .04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.622
.075 .04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.62 AT & SF RAILROAD
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

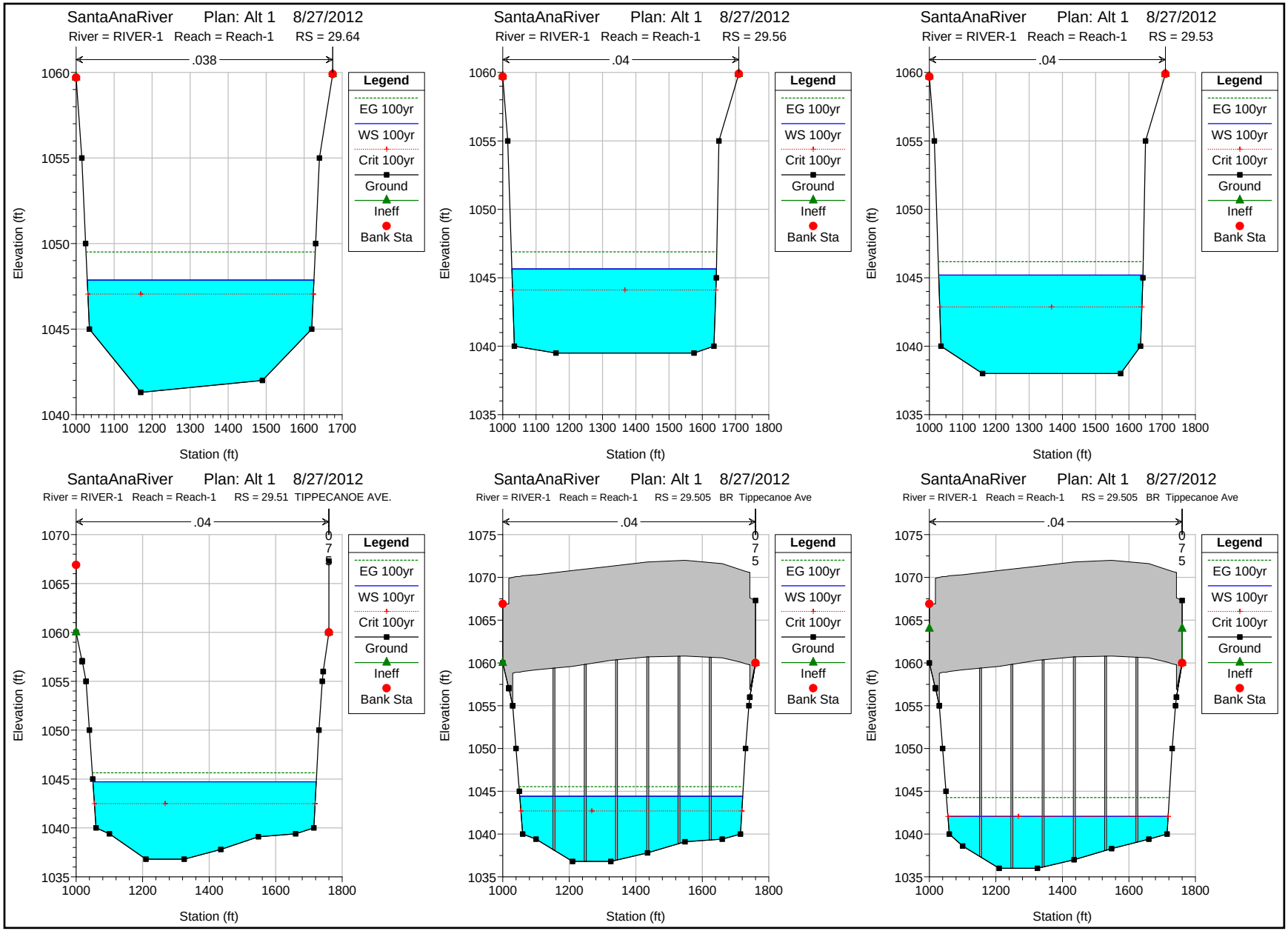

SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.615 BR Railroad
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.615 BR Railroad
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.61
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.608
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.606
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.604
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

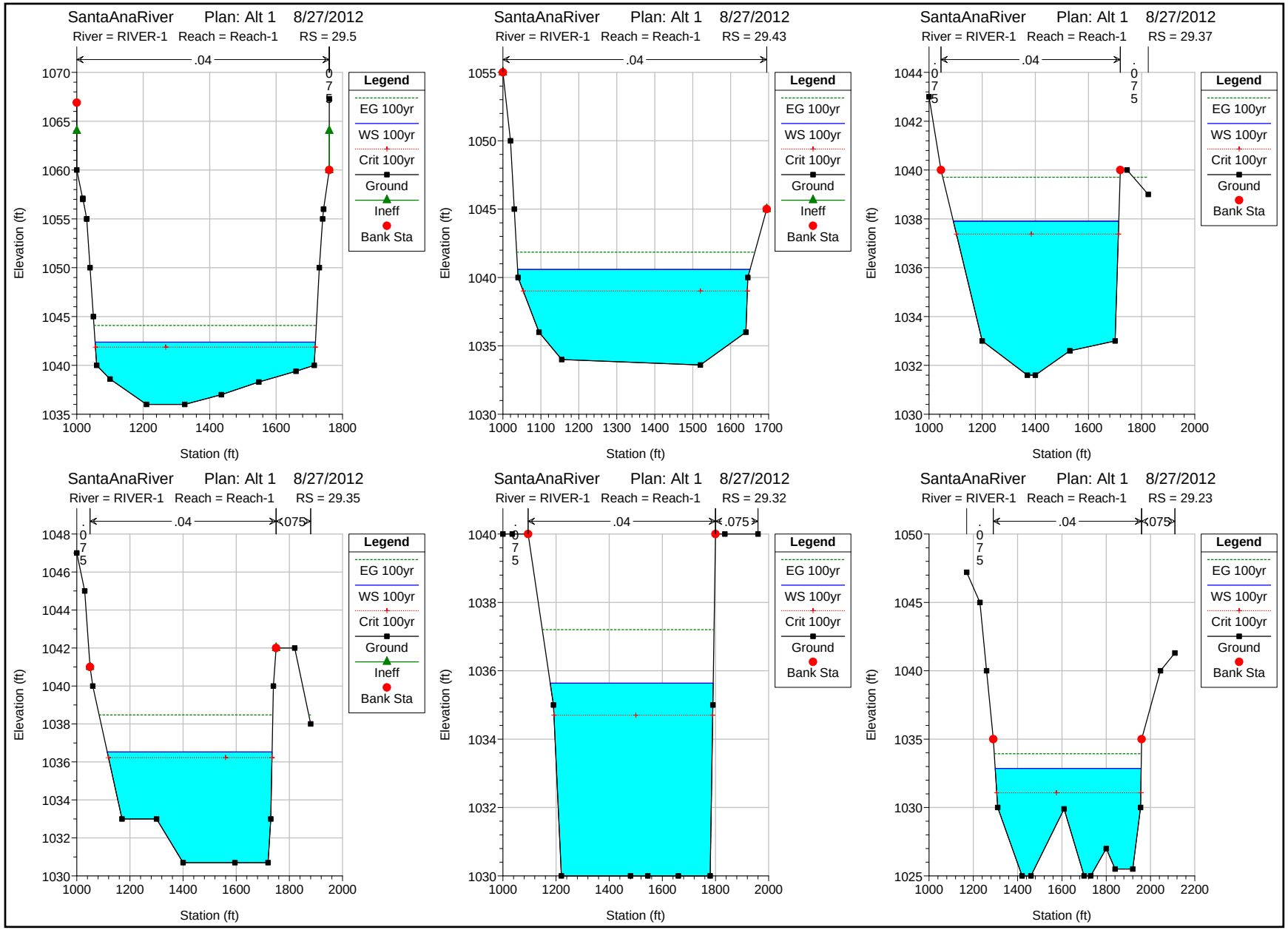

SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.602
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.6
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.597
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.595
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.59
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.58
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
900
1000
1100
1200
1300
1400
1004
1006
1008
1010
1012
1014
1016
1018

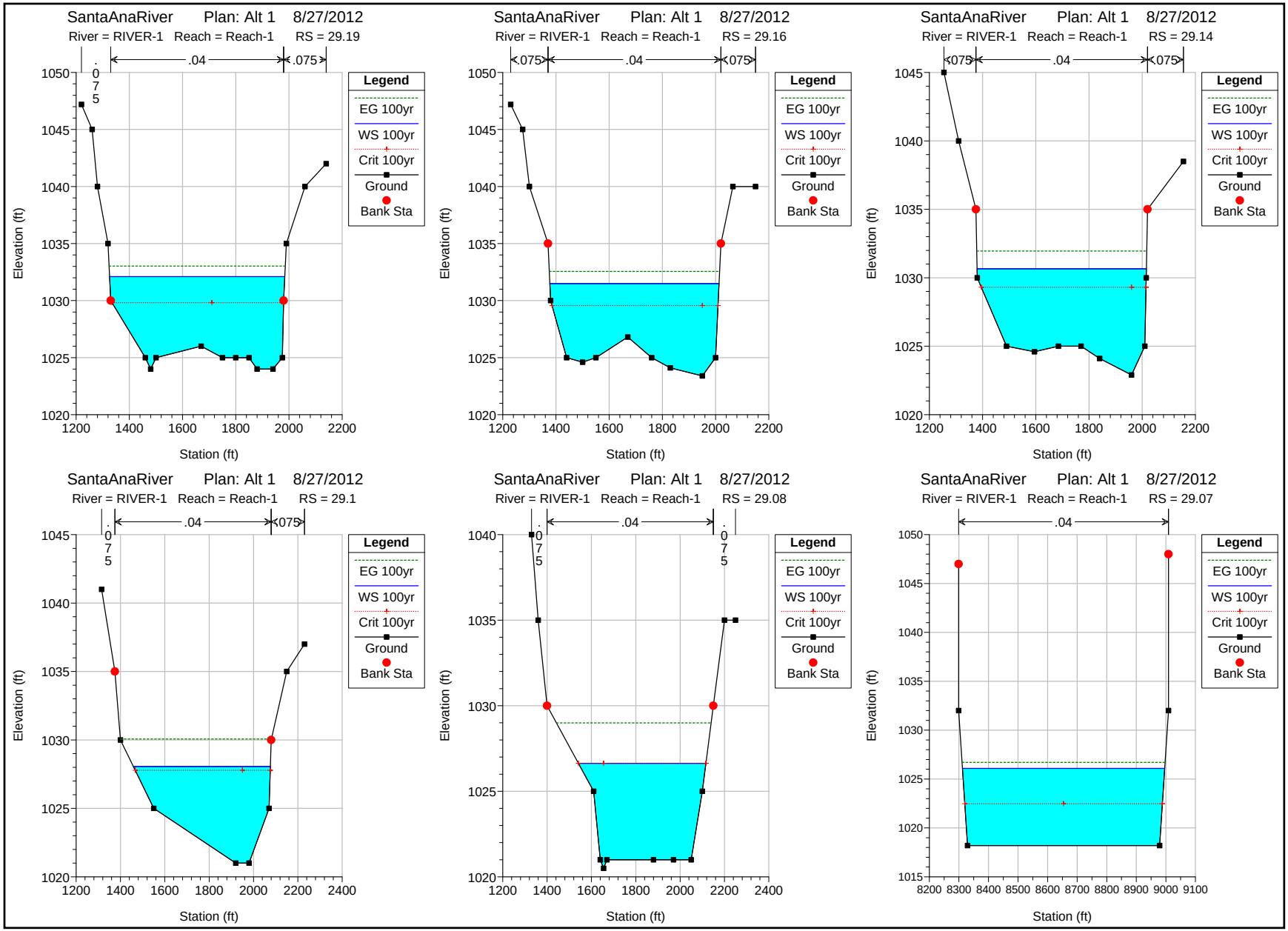

SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.57
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.55
.075
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.53
.075
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.49
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.43
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.38
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

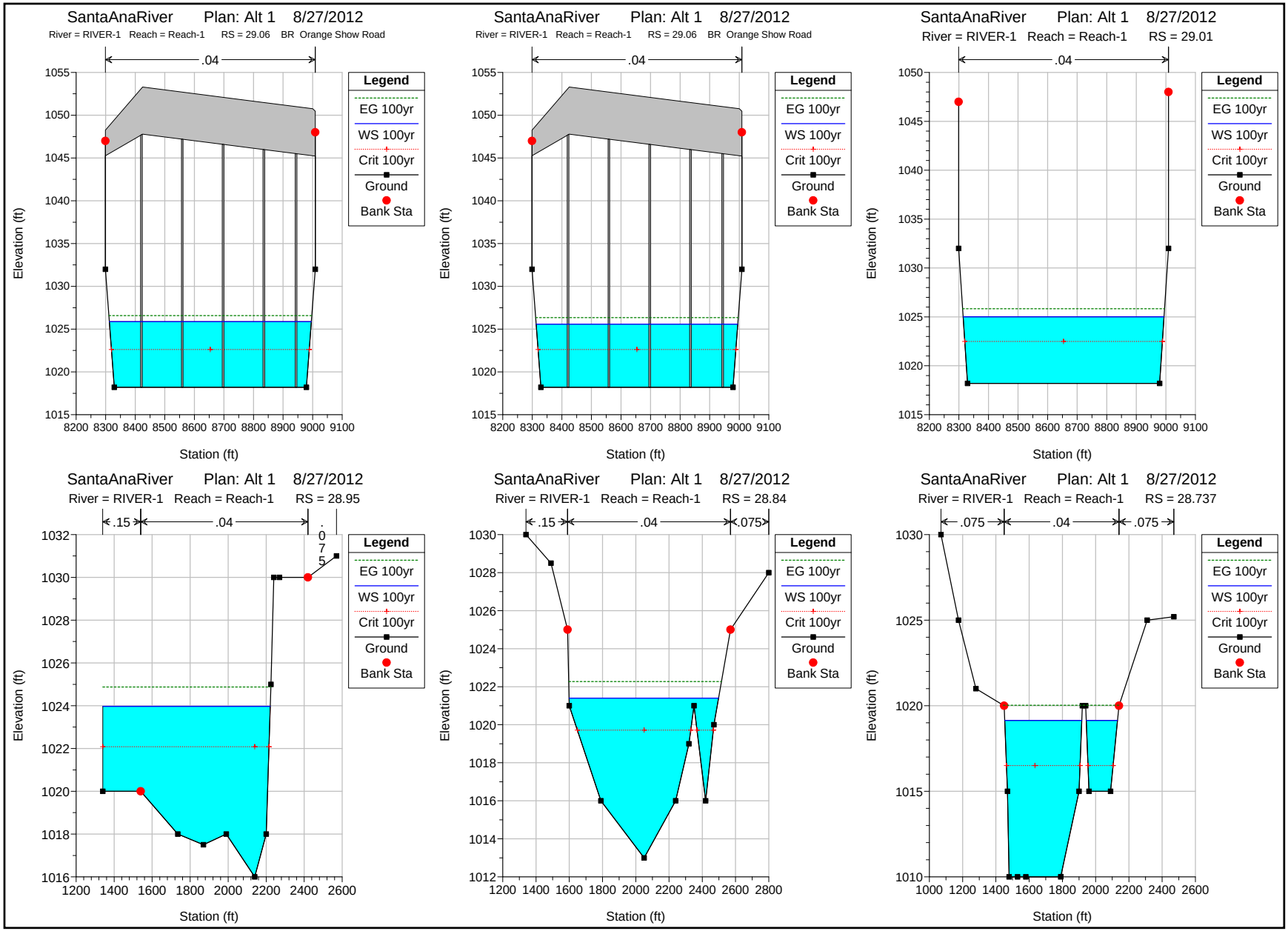

SantaAnaRiver Plan: SAR_EX_Pier 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.3
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
1020
1015
1010
1005
1000
995
1000
1200
1400
1600
1800
2000
2200

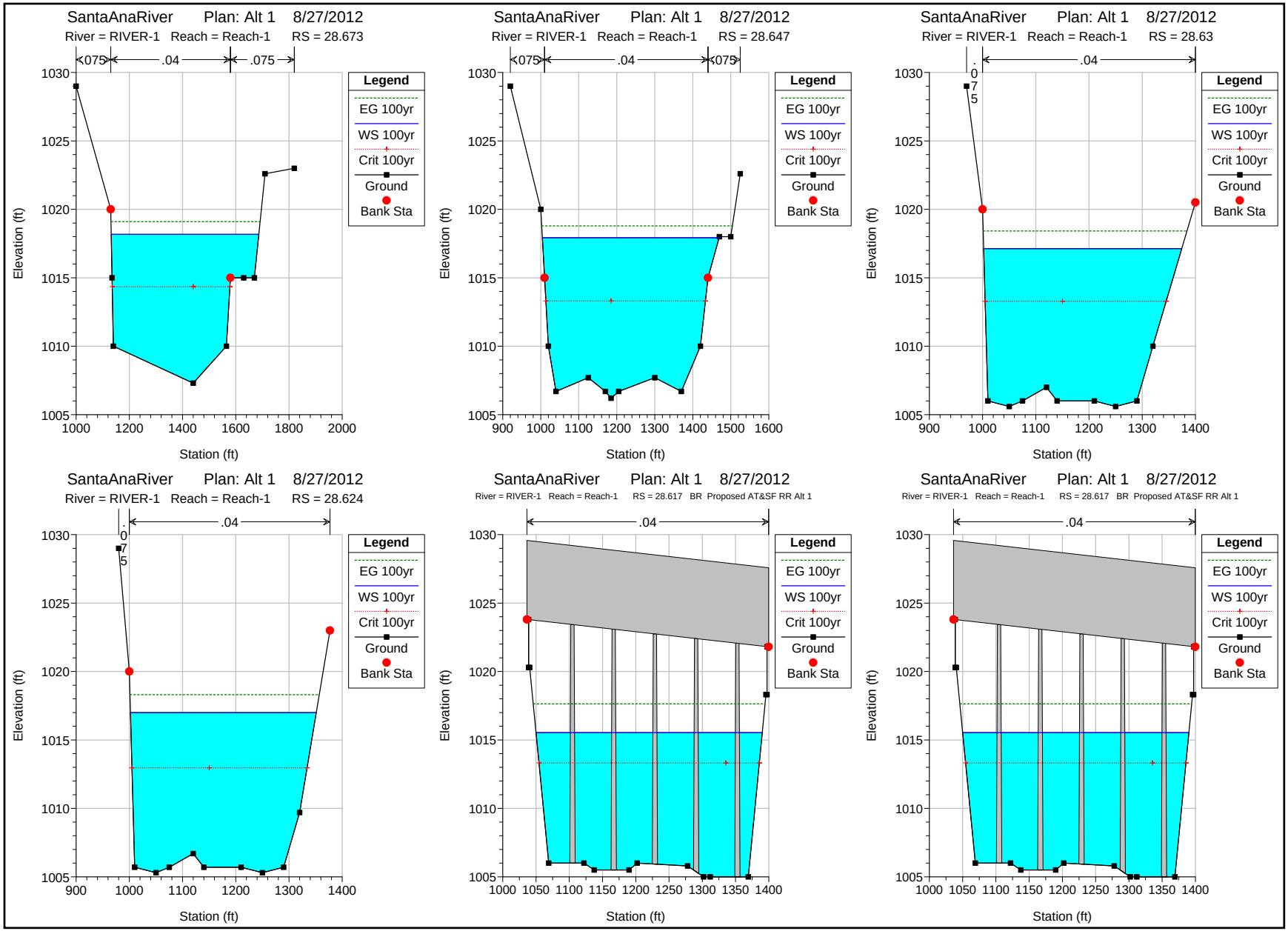

SantaAnaRiver Plan: Alt 1 8/27/2012
RIVER-1 Reach-1
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
LOB
ROB
Elevation (ft)
1070
1060
1050
1040
1030
1020
1010
1000
990
0
1000
2000
3000
4000
5000
6000
7000
Main Channel Distance (ft)
Proposed AT&SF R
Orange Show Road
Tippecanoe Ave


SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.64
.038
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.56
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.53
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.51 TIPPECANOE AVE.
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.505 BR Tippecanoe Ave
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.505 BR Tippecanoe Ave
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.5
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.43
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.37
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.35
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.32
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.23
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.19
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.16
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.14
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.1
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.08
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.07
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.06 BR Orange Show Road
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.06 BR Orange Show Road
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.01
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.95
.15
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.84
.15
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.737
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)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.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.647
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.63
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.624
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.617 BR Proposed AT&SF RR Alt 1
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
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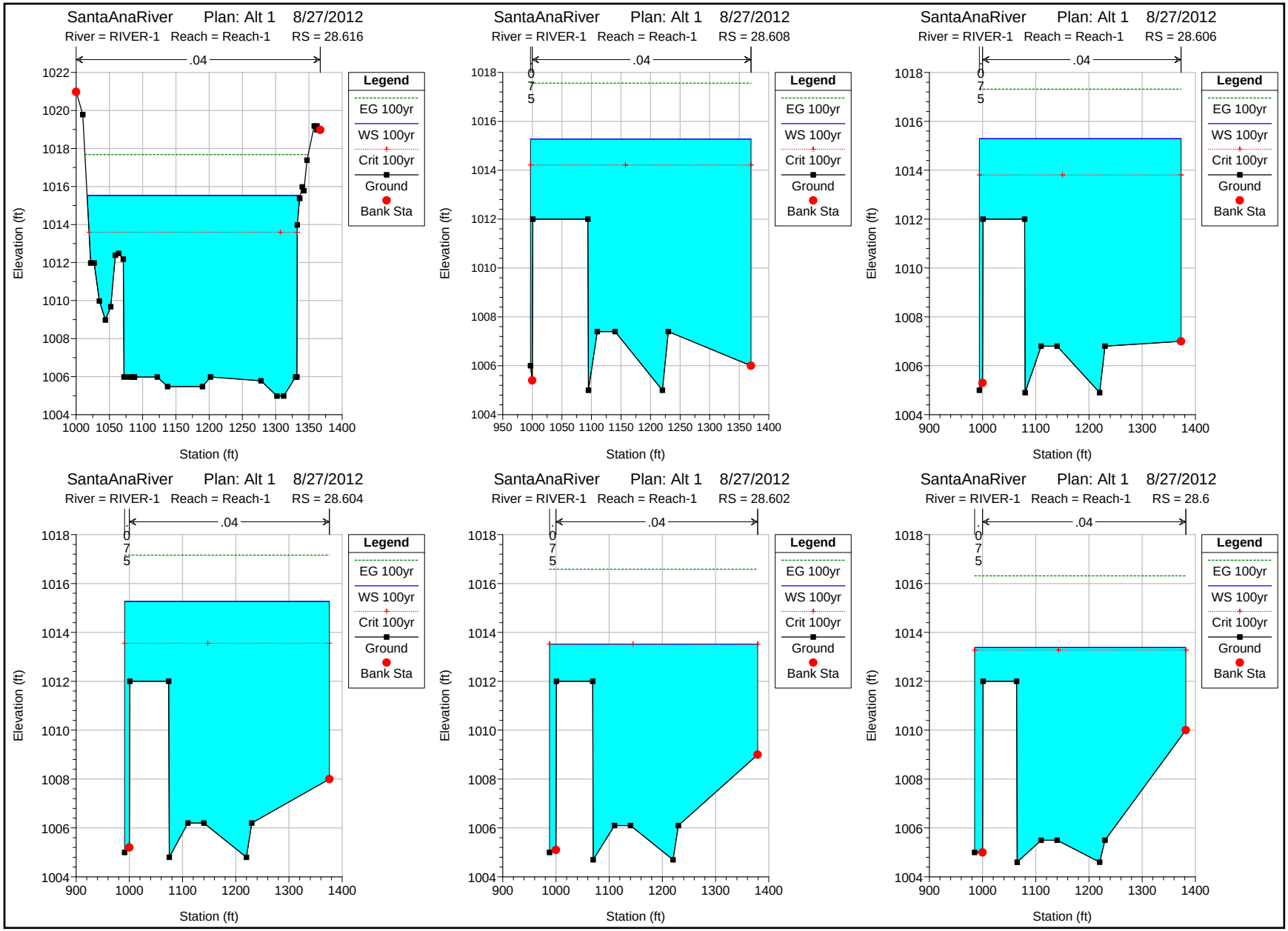
River = RIVER-1 Reach = Reach-1 RS = 28.617 BR Proposed AT&SF RR Alt 1
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)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SantaAnaRiver Plan: Alt 1 8/27/2012
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SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.604
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.602
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.6
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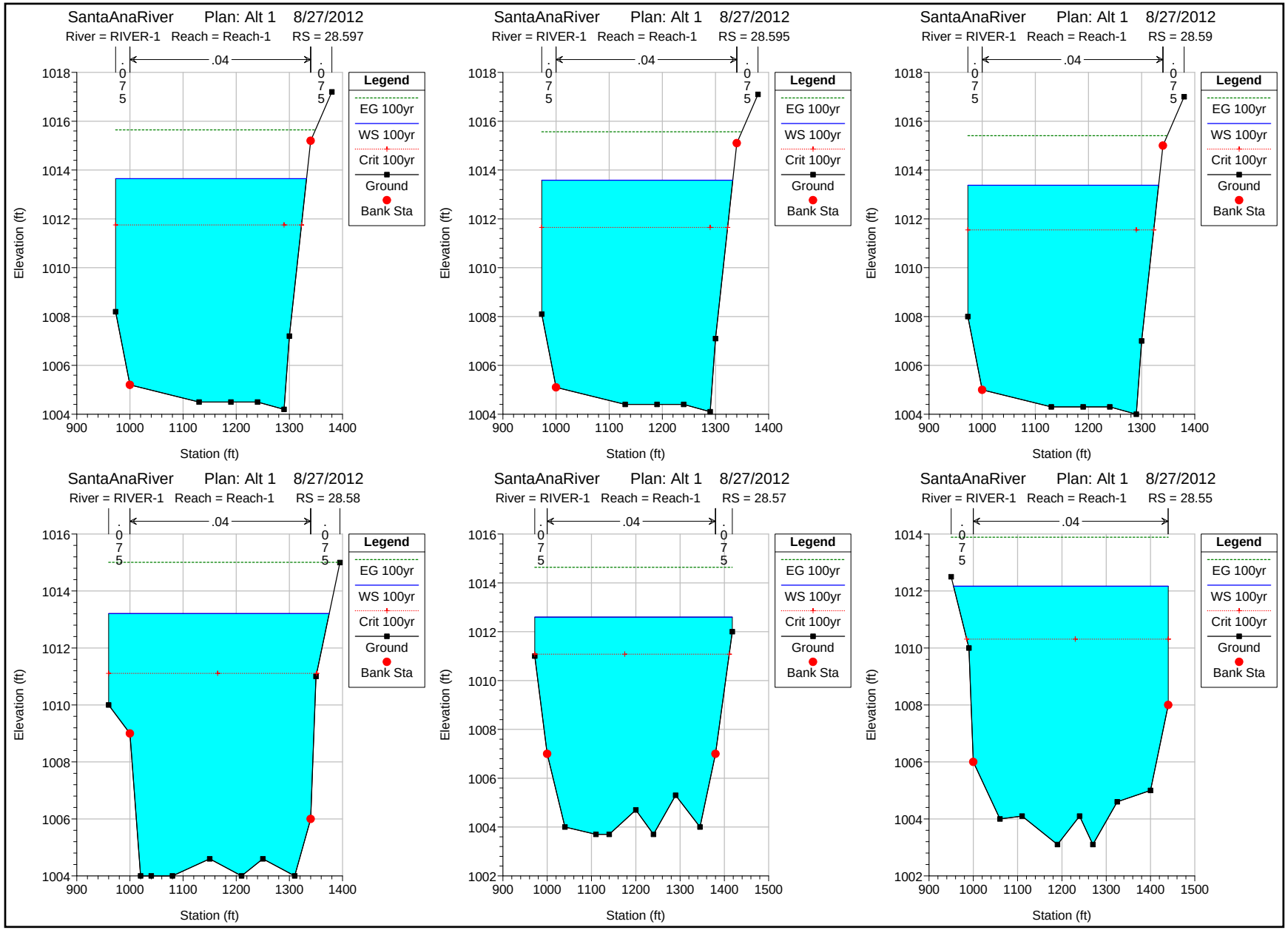
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)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SantaAnaRiver Plan: Alt 1 8/27/2012
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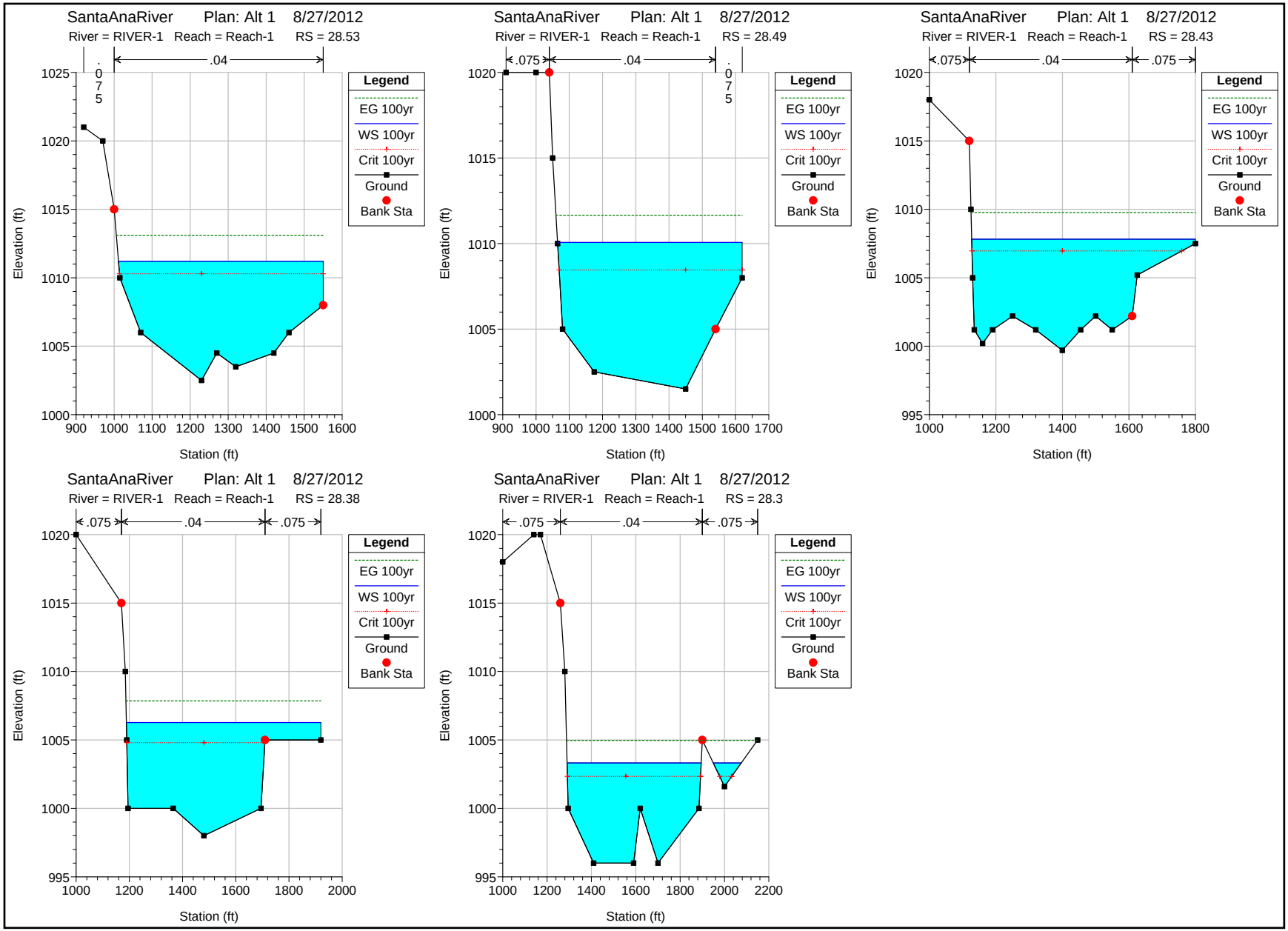
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.58
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.57
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.55
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)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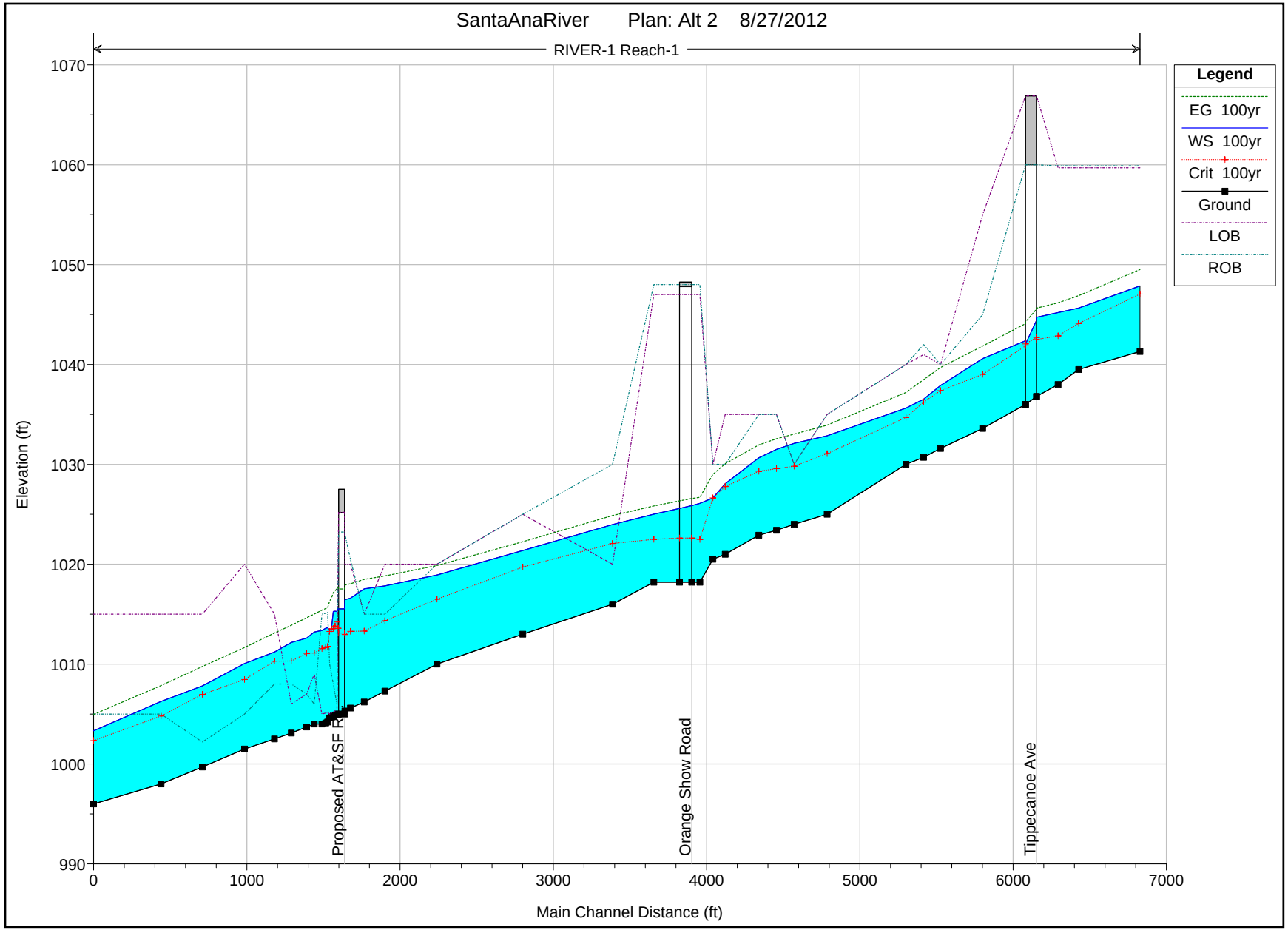
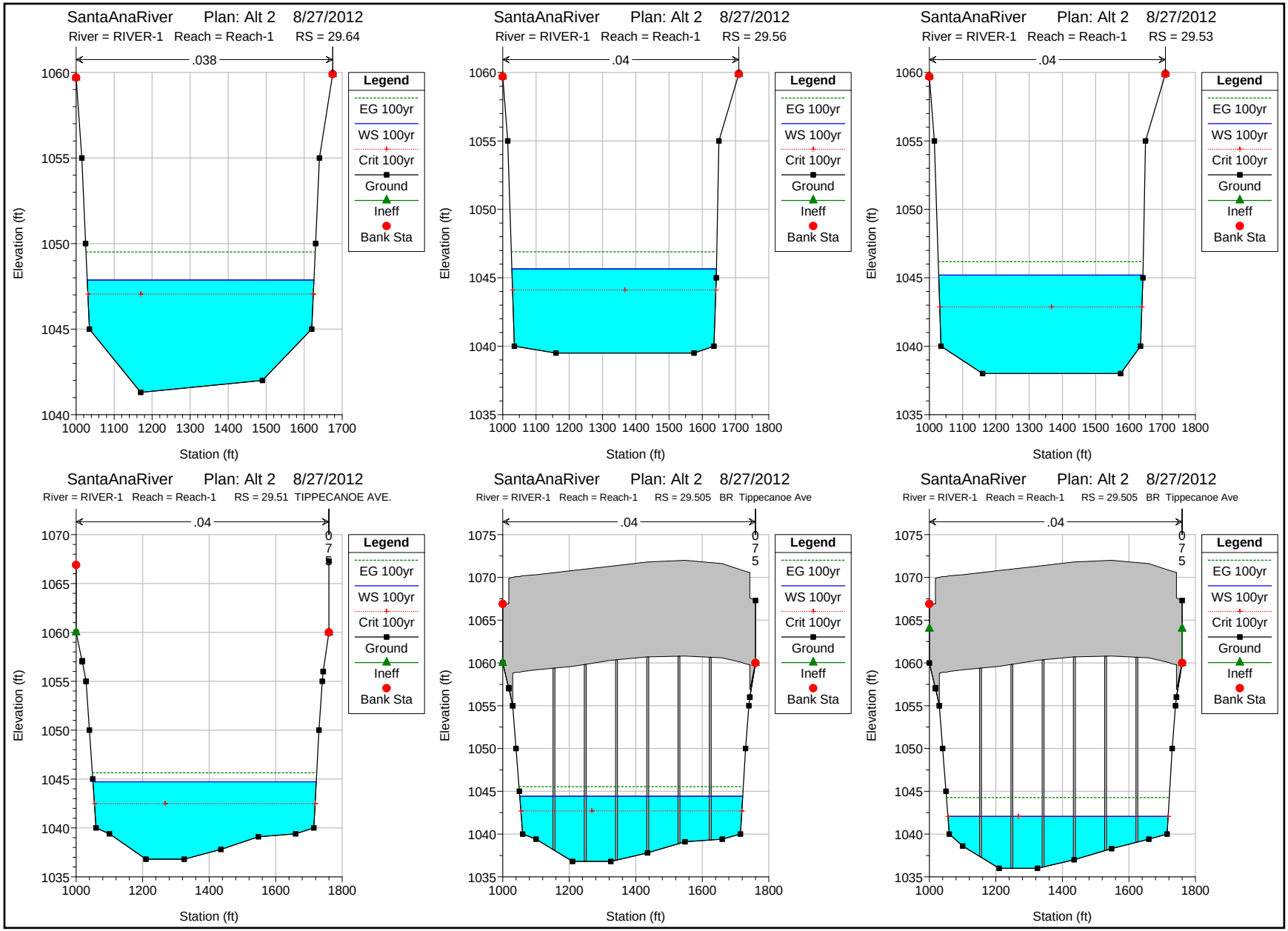
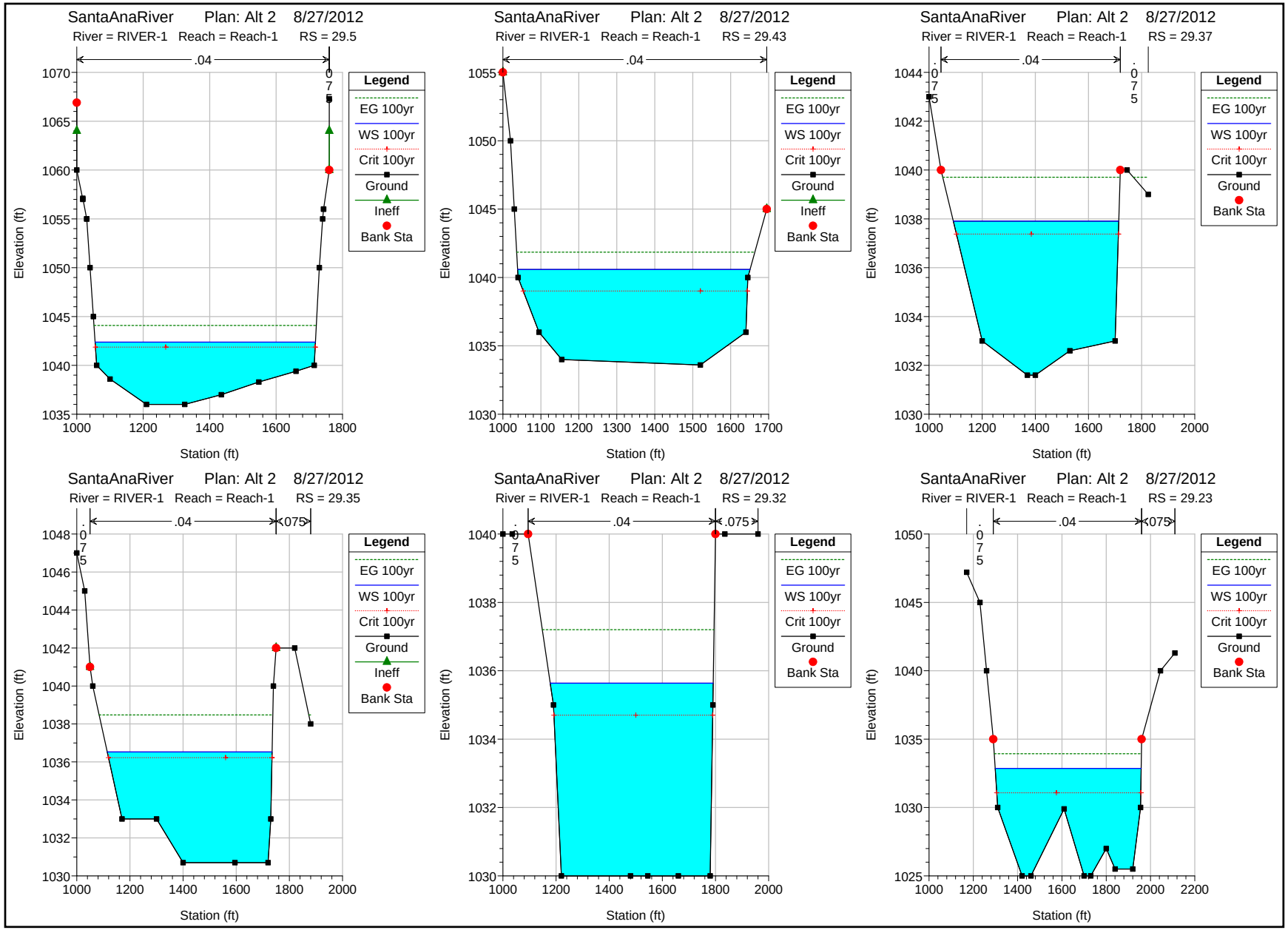
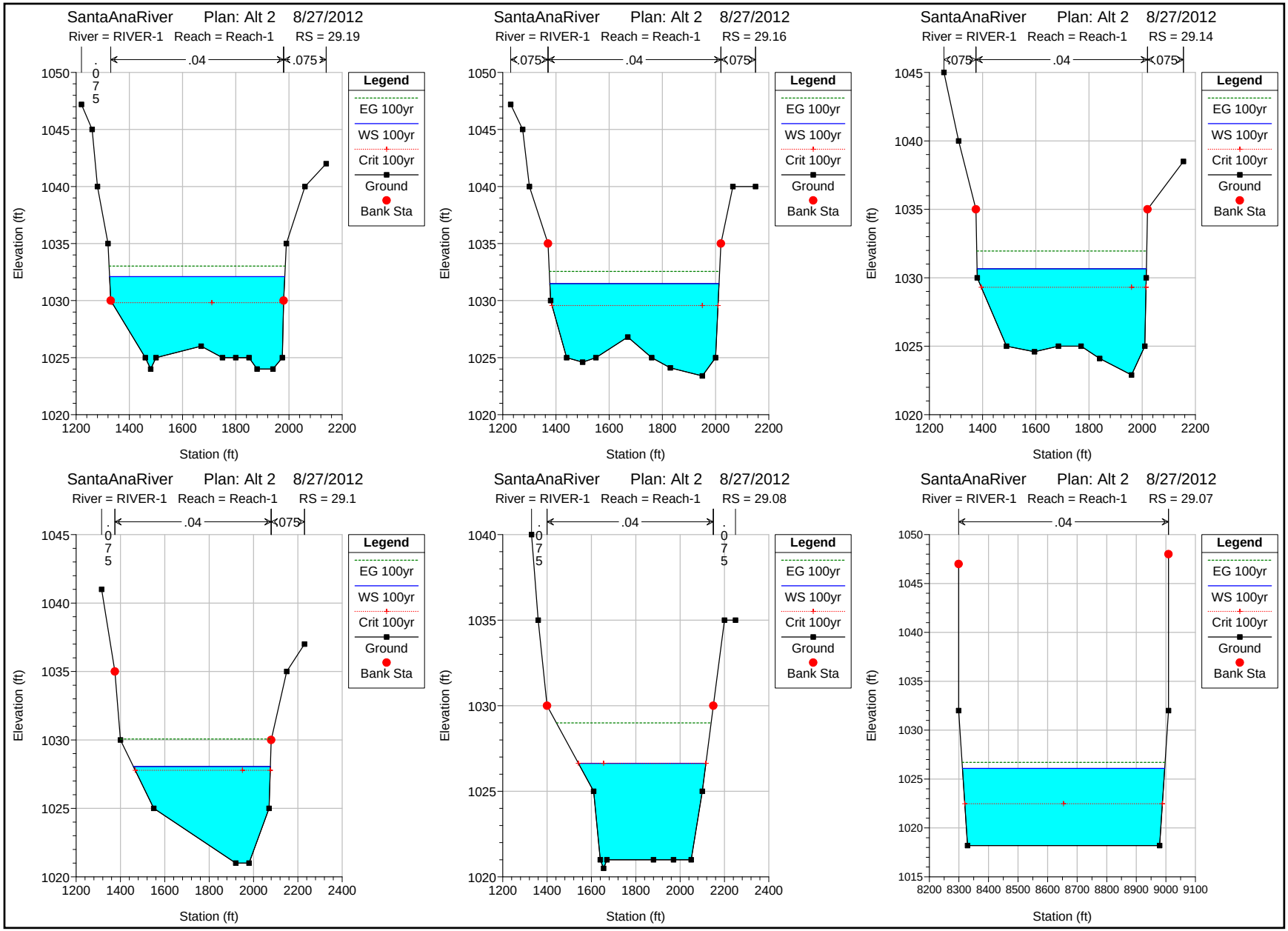
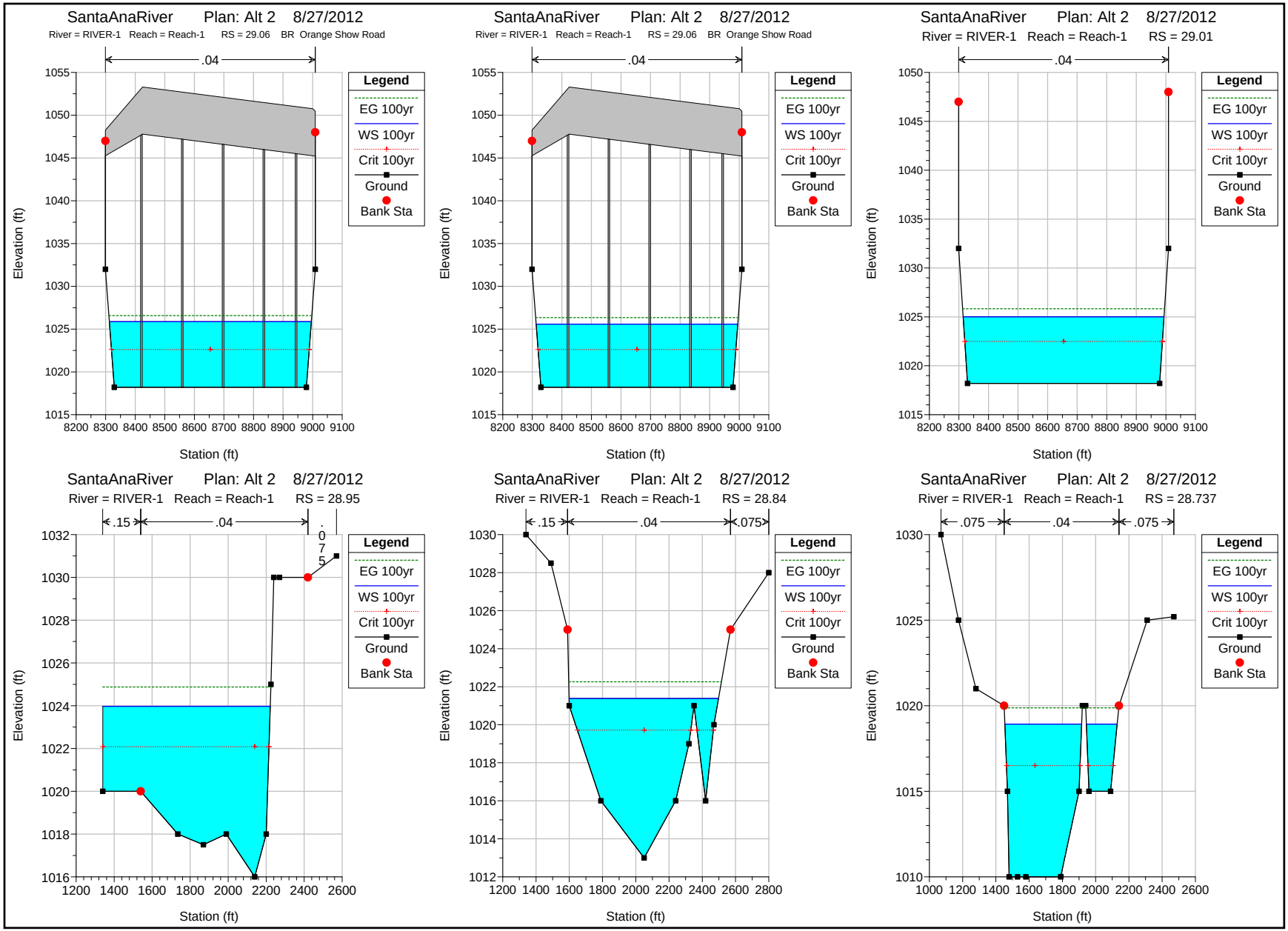
River = RIVER-1 Reach = Reach-1 RS = 28.53
.075
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.49
.075
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.43
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.38
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 1 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.3
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

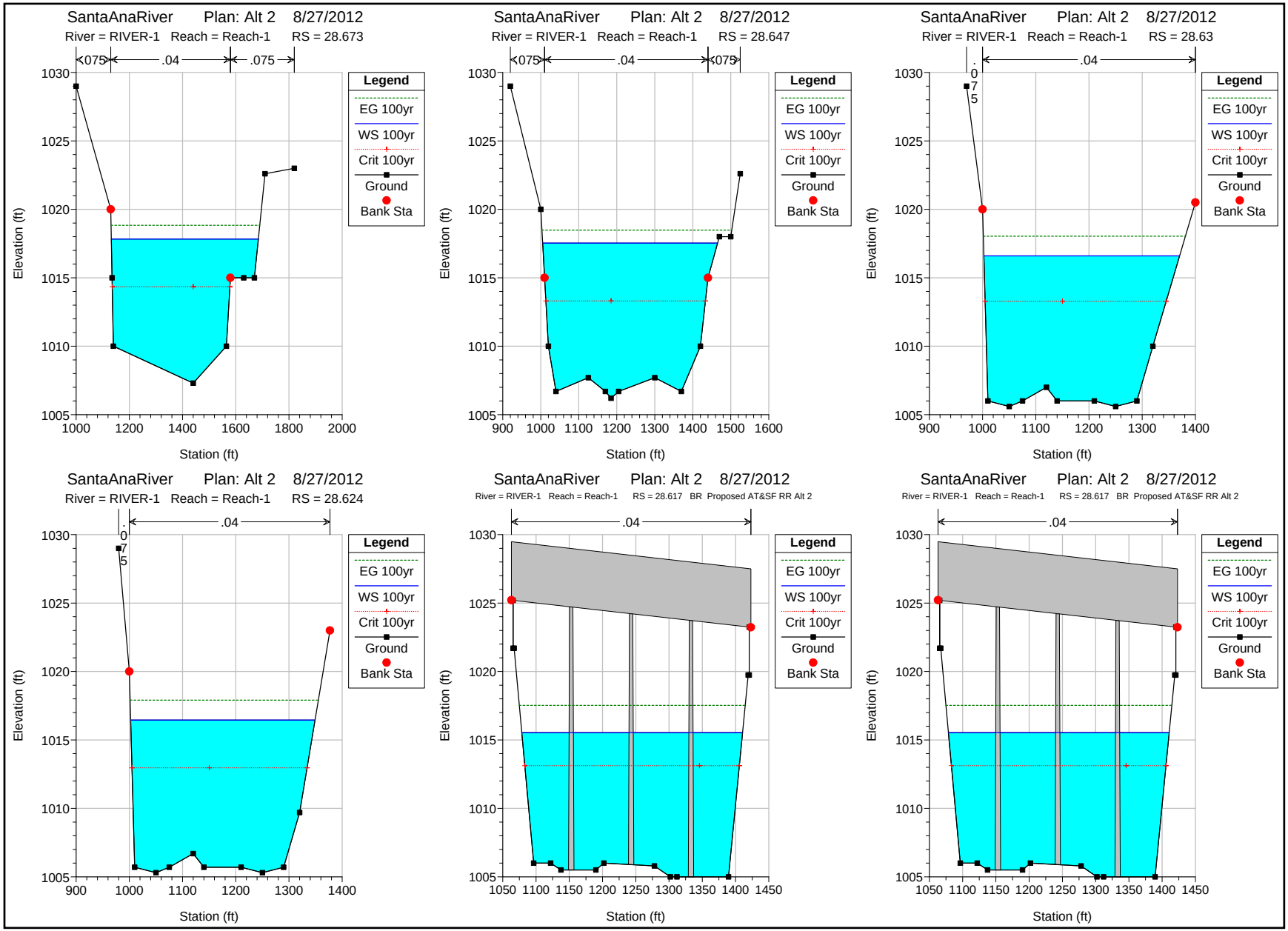

SantaAnaRiver Plan: Alt 2 8/27/2012
RIVER-1 Reach-1
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
LOB
ROB
Elevation (ft)
1070
1060
1050
1040
1030
1020
1010
1000
990
0
1000
2000
3000
4000
5000
6000
7000
Main Channel Distance (ft)
Proposed AT&SF R
Orange Show Road
Tippecanoe Ave


SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.64
.038
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.56
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.53
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.51 TIPPECANOE AVE.
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.505 BR Tippecanoe Ave
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.505 BR Tippecanoe Ave
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.5
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.43
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.37
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.35
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.32
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.23
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.19
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.16
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.14
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.1
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.08
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.07
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.06 BR Orange Show Road
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.06 BR Orange Show Road
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 29.01
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.95
.15
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.84
.15
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.737
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)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River = RIVER-1 Reach = Reach-1 RS = 28.673
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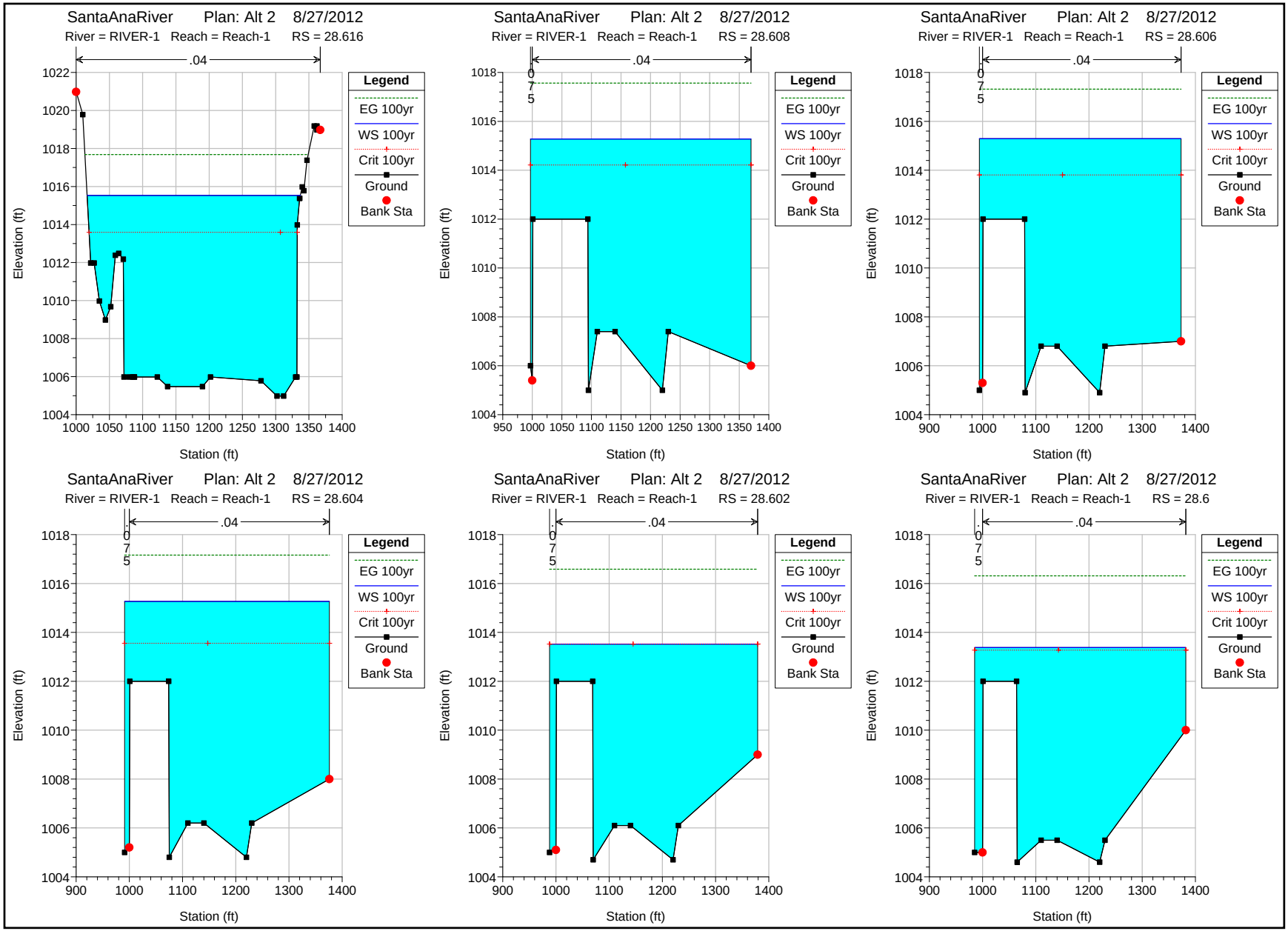
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.647
.075 .04 .075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.63
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.624
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.617 BR Proposed AT&SF RR Alt 2
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.617 BR Proposed AT&SF RR Alt 2
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)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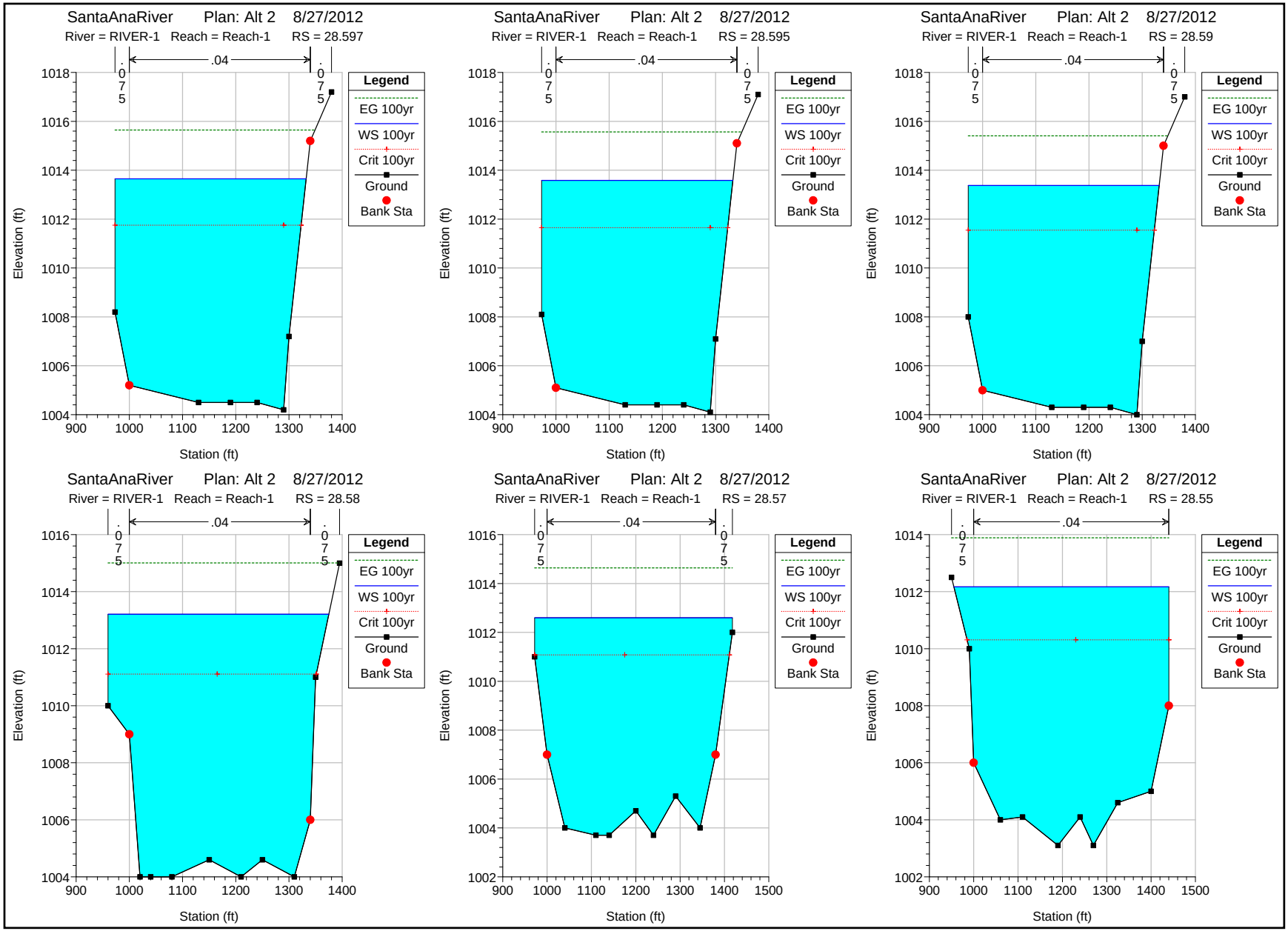
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.608
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.606
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.604
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.602
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.6
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)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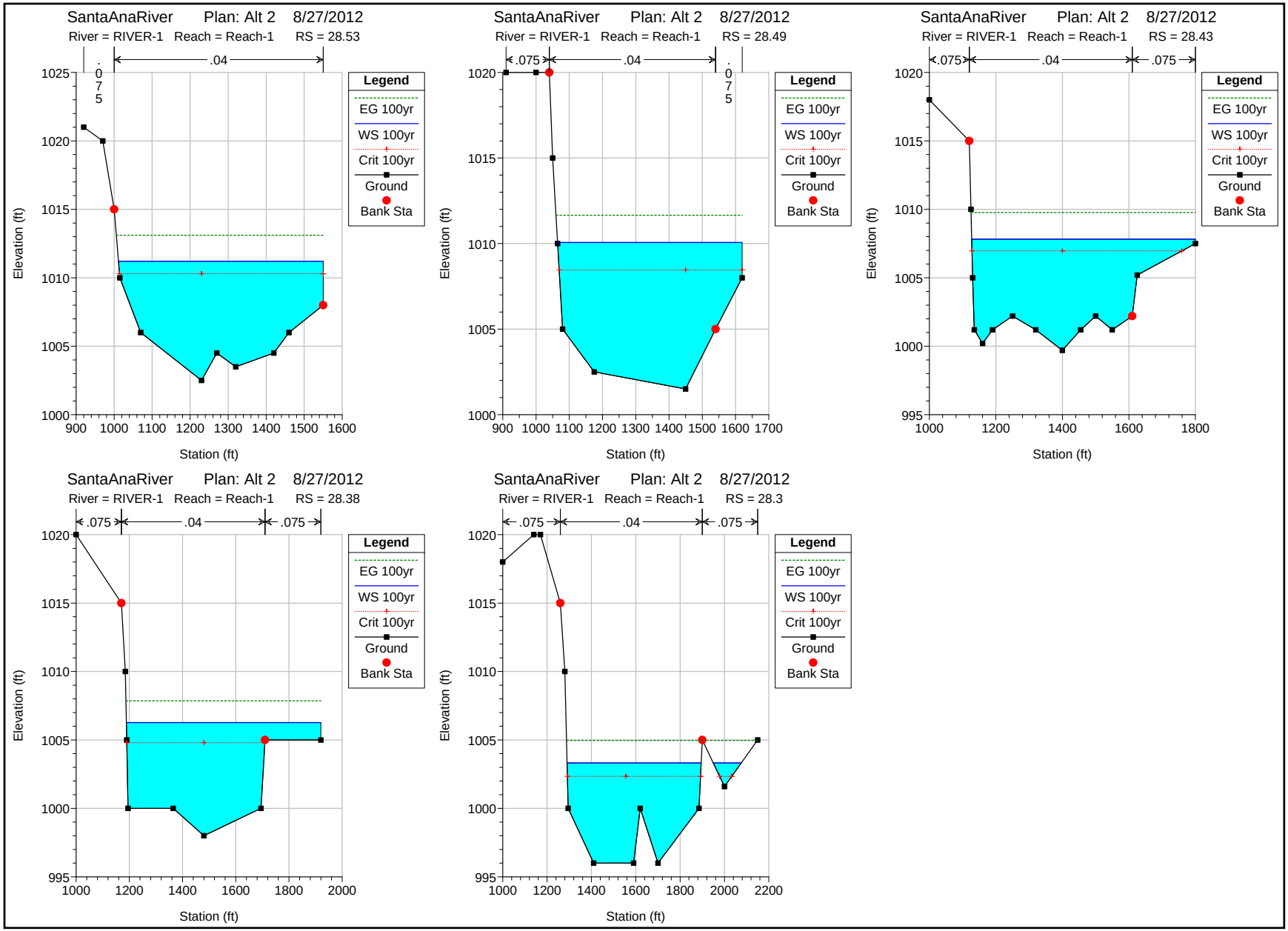
River = RIVER-1 Reach = Reach-1 RS = 28.597
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.595
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.59
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.58
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.57
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.55
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.53
.075
.04
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.49
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.43
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.38
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
SantaAnaRiver Plan: Alt 2 8/27/2012
River = RIVER-1 Reach = Reach-1 RS = 28.3
.075
.04
.075
Legend
EG 100yr
WS 100yr
Crit 100yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

Attachment 2 – Hydraulic Analysis Results

HEC-RAS Plan: Model2_Pier River: RIVER-1 Reach: Reach-1 Profile: 100yr

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	29.64	100yr	33000.00	1041.30	1047.87	1047.05	1049.51	0.007337	10.27	3212.01	596.48	0.78
Reach-1	29.56	100yr	33000.00	1039.50	1045.65	1044.11	1046.89	0.005383	8.95	3685.31	615.05	0.64
Reach-1	29.53	100yr	33000.00	1038.00	1045.20	1042.87	1046.17	0.003551	7.91	4171.84	614.09	0.53
Reach-1	29.51	100yr	33000.00	1036.80	1044.73	1042.49	1045.64	0.003619	7.68	4295.97	671.54	0.54
Reach-1	29.505		Bridge									
Reach-1	29.5	100yr	33000.00	1036.00	1042.38	1041.88	1044.09	0.009995	10.48	3149.66	663.33	0.85
Reach-1	29.43	100yr	33000.00	1033.60	1040.59	1039.01	1041.85	0.005416	9.00	3666.62	612.09	0.65
Reach-1	29.37	100yr	33000.00	1031.60	1037.91	1037.38	1039.71	0.010051	10.77	3065.04	622.62	0.86
Reach-1	29.35	100yr	33000.00	1030.70	1036.52	1036.23	1038.48	0.011479	11.22	2942.21	620.41	0.91
Reach-1	29.32	100yr	33000.00	1030.00	1035.64	1034.70	1037.20	0.007815	10.04	3287.56	613.41	0.76
Reach-1	29.23	100yr	33000.00	1025.00	1032.86	1031.07	1033.93	0.004581	8.31	3972.50	659.31	0.60
Reach-1	29.19	100yr	33000.00	1024.00	1032.10	1029.82	1033.03	0.003548	7.74	4273.08	658.40	0.53
Reach-1	29.16	100yr	33000.00	1023.40	1031.49	1029.57	1032.56	0.004358	8.30	3974.96	635.97	0.59
Reach-1	29.14	100yr	33000.00	1022.90	1030.66	1029.30	1031.96	0.006036	9.15	3606.95	636.31	0.68
Reach-1	29.1	100yr	33000.00	1021.00	1028.06	1027.78	1030.07	0.011944	11.37	2901.58	617.95	0.92
Reach-1	29.08	100yr	33000.00	1020.50	1026.64	1026.64	1028.99	0.014144	12.32	2679.49	575.14	1.01
Reach-1	29.07	100yr	33000.00	1018.20	1026.09	1022.48	1026.70	0.001888	6.27	5264.22	684.31	0.40
Reach-1	29.06		Bridge									
Reach-1	29.01	100yr	33000.00	1018.20	1025.01	1022.49	1025.83	0.003092	7.29	4526.32	679.60	0.50
Reach-1	28.95	100yr	33000.00	1016.00	1023.97	1022.08	1024.88	0.004038	7.78	4876.25	881.32	0.56
Reach-1	28.84	100yr	33000.00	1013.00	1021.52	1019.72	1022.35	0.004526	7.31	4514.60	901.79	0.58
Reach-1	28.737	100yr	33000.00	1010.00	1019.68	1016.50	1020.44	0.002620	7.00	4710.99	662.94	0.46
Reach-1	28.673	100yr	33000.00	1007.30	1018.95	1014.35	1019.72	0.001729	7.15	4907.83	559.71	0.40
Reach-1	28.647	100yr	33000.00	1006.20	1018.75	1013.31	1019.49	0.001421	6.92	4857.34	501.55	0.37
Reach-1	28.63	100yr	33000.00	1005.60	1018.16	1013.27	1019.21	0.002177	8.23	4011.19	380.83	0.45
Reach-1	28.624	100yr	33000.00	1005.30	1018.05	1012.97	1019.12	0.002062	8.32	3966.54	354.41	0.44
Reach-1	28.622	100yr	33000.00	1005.20	1018.01	1012.87	1019.09	0.002027	8.36	3945.54	344.72	0.44
Reach-1	28.62	100yr	33000.00	1005.00	1017.29	1013.96	1018.86	0.003619	10.07	3276.05	332.82	0.57
Reach-1	28.615		Bridge									
Reach-1	28.61	100yr	33000.00	1005.00	1015.58	1013.62	1017.71	0.005847	11.72	2815.08	320.75	0.70
Reach-1	28.608	100yr	33000.00	1005.00	1015.28	1014.21	1017.56	0.008124	12.15	2736.49	373.00	0.79
Reach-1	28.606	100yr	33000.00	1004.90	1015.29	1013.81	1017.32	0.006773	11.46	2918.43	379.00	0.73
Reach-1	28.604	100yr	33000.00	1004.80	1015.27	1013.55	1017.16	0.006161	11.10	3028.83	385.00	0.70
Reach-1	28.602	100yr	33000.00	1004.70	1013.52	1013.52	1016.58	0.014065	14.16	2383.33	391.00	1.02
Reach-1	28.6	100yr	33000.00	1004.60	1013.38	1013.27	1016.31	0.013357	13.88	2439.56	397.00	0.99
Reach-1	28.597	100yr	33000.00	1004.20	1013.65	1011.75	1015.65	0.005597	11.48	2985.02	359.23	0.70
Reach-1	28.595	100yr	33000.00	1004.10	1013.59	1011.65	1015.57	0.005512	11.42	2999.57	359.43	0.69
Reach-1	28.59	100yr	33000.00	1004.00	1013.37	1011.55	1015.41	0.005752	11.58	2959.12	358.87	0.71
Reach-1	28.58	100yr	33000.00	1004.00	1013.21	1011.11	1015.01	0.004741	10.86	3203.66	414.82	0.65
Reach-1	28.57	100yr	36500.00	1003.70	1012.60	1011.08	1014.64	0.005922	11.56	3312.57	446.00	0.71
Reach-1	28.55	100yr	36500.00	1003.10	1012.17	1010.31	1013.89	0.005260	10.55	3523.03	484.69	0.66
Reach-1	28.53	100yr	36500.00	1002.50	1011.21	1010.29	1013.11	0.007996	11.07	3298.01	538.62	0.79
Reach-1	28.49	100yr	36500.00	1001.50	1010.06	1008.46	1011.66	0.005396	10.25	3752.26	555.18	0.67
Reach-1	28.43	100yr	36500.00	999.70	1007.82	1006.96	1009.77	0.007633	11.31	3477.09	672.82	0.78
Reach-1	28.38	100yr	36500.00	998.00	1006.27	1004.80	1007.86	0.005885	10.18	3806.98	731.27	0.69
Reach-1	28.3	100yr	36500.00	996.00	1003.32	1002.34	1004.96	0.007384	10.31	3632.37	731.41	0.75

HEC-RAS Plan: Alt 1 River: RIVER-1 Reach: Reach-1 Profile: 100yr

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	29.64	100yr	33000.00	1041.30	1047.87	1047.05	1049.51	0.007337	10.27	3212.01	596.48	0.78
Reach-1	29.56	100yr	33000.00	1039.50	1045.65	1044.11	1046.89	0.005383	8.95	3685.31	615.05	0.64
Reach-1	29.53	100yr	33000.00	1038.00	1045.20	1042.87	1046.17	0.003551	7.91	4171.84	614.09	0.53
Reach-1	29.51	100yr	33000.00	1036.80	1044.73	1042.49	1045.64	0.003619	7.68	4295.97	671.54	0.54
Reach-1	29.505		Bridge									
Reach-1	29.5	100yr	33000.00	1036.00	1042.38	1041.88	1044.09	0.009995	10.48	3149.66	663.33	0.85
Reach-1	29.43	100yr	33000.00	1033.60	1040.59	1039.01	1041.85	0.005416	9.00	3666.62	612.09	0.65
Reach-1	29.37	100yr	33000.00	1031.60	1037.91	1037.38	1039.71	0.010051	10.77	3065.04	622.62	0.86
Reach-1	29.35	100yr	33000.00	1030.70	1036.52	1036.23	1038.48	0.011479	11.22	2942.21	620.41	0.91
Reach-1	29.32	100yr	33000.00	1030.00	1035.64	1034.70	1037.20	0.007815	10.04	3287.56	613.41	0.76
Reach-1	29.23	100yr	33000.00	1025.00	1032.86	1031.07	1033.93	0.004581	8.31	3972.50	659.31	0.60
Reach-1	29.19	100yr	33000.00	1024.00	1032.10	1029.82	1033.03	0.003548	7.74	4273.08	658.40	0.53
Reach-1	29.16	100yr	33000.00	1023.40	1031.49	1029.57	1032.56	0.004358	8.30	3974.96	635.97	0.59
Reach-1	29.14	100yr	33000.00	1022.90	1030.66	1029.30	1031.96	0.006036	9.15	3606.95	636.31	0.68
Reach-1	29.1	100yr	33000.00	1021.00	1028.06	1027.78	1030.07	0.011944	11.37	2901.58	617.95	0.92
Reach-1	29.08	100yr	33000.00	1020.50	1026.64	1026.64	1028.99	0.014144	12.32	2679.49	575.14	1.01
Reach-1	29.07	100yr	33000.00	1018.20	1026.09	1022.48	1026.70	0.001888	6.27	5264.47	684.31	0.40
Reach-1	29.06		Bridge									
Reach-1	29.01	100yr	33000.00	1018.20	1025.01	1022.49	1025.83	0.003091	7.29	4526.74	679.61	0.50
Reach-1	28.95	100yr	33000.00	1016.00	1023.97	1022.08	1024.88	0.004034	7.78	4877.91	881.33	0.56
Reach-1	28.84	100yr	33000.00	1013.00	1021.40	1019.72	1022.27	0.004909	7.50	4400.13	898.93	0.60
Reach-1	28.737	100yr	33000.00	1010.00	1019.14	1016.50	1020.03	0.003320	7.58	4355.59	651.03	0.52
Reach-1	28.673	100yr	33000.00	1007.30	1018.18	1014.35	1019.10	0.002269	7.78	4479.21	554.89	0.45
Reach-1	28.647	100yr	33000.00	1006.20	1017.92	1013.31	1018.79	0.001846	7.49	4447.87	465.05	0.41
Reach-1	28.63	100yr	33000.00	1005.60	1017.13	1013.28	1018.42	0.002956	9.10	3624.66	372.27	0.51
Reach-1	28.624	100yr	33000.00	1005.30	1017.00	1012.96	1018.31	0.002792	9.17	3598.19	349.19	0.50
Reach-1	28.617		Bridge									
Reach-1	28.616	100yr	33000.00	1004.98	1015.53	1013.59	1017.68	0.005895	11.75	2807.58	320.56	0.70
Reach-1	28.608	100yr	33000.00	1005.00	1015.28	1014.21	1017.56	0.008124	12.15	2736.49	373.00	0.79
Reach-1	28.606	100yr	33000.00	1004.90	1015.29	1013.81	1017.32	0.006773	11.46	2918.43	379.00	0.73
Reach-1	28.604	100yr	33000.00	1004.80	1015.27	1013.55	1017.16	0.006161	11.10	3028.83	385.00	0.70
Reach-1	28.602	100yr	33000.00	1004.70	1013.52	1013.52	1016.58	0.014065	14.16	2383.33	391.00	1.02
Reach-1	28.6	100yr	33000.00	1004.60	1013.38	1013.27	1016.31	0.013357	13.88	2439.56	397.00	0.99
Reach-1	28.597	100yr	33000.00	1004.20	1013.65	1011.75	1015.65	0.005597	11.48	2985.02	359.23	0.70
Reach-1	28.595	100yr	33000.00	1004.10	1013.59	1011.65	1015.57	0.005512	11.42	2999.57	359.43	0.69
Reach-1	28.59	100yr	33000.00	1004.00	1013.37	1011.55	1015.41	0.005752	11.58	2959.12	358.87	0.71
Reach-1	28.58	100yr	33000.00	1004.00	1013.21	1011.11	1015.01	0.004741	10.86	3203.66	414.82	0.65
Reach-1	28.57	100yr	36500.00	1003.70	1012.60	1011.08	1014.64	0.005922	11.56	3312.57	446.00	0.71
Reach-1	28.55	100yr	36500.00	1003.10	1012.17	1010.31	1013.89	0.005260	10.55	3523.03	484.69	0.66
Reach-1	28.53	100yr	36500.00	1002.50	1011.21	1010.29	1013.11	0.007996	11.07	3298.01	538.62	0.79
Reach-1	28.49	100yr	36500.00	1001.50	1010.06	1008.46	1011.66	0.005396	10.25	3752.26	555.18	0.67
Reach-1	28.43	100yr	36500.00	999.70	1007.82	1006.96	1009.77	0.007633	11.31	3477.09	672.82	0.78
Reach-1	28.38	100yr	36500.00	998.00	1006.27	1004.80	1007.86	0.005885	10.18	3806.98	731.27	0.69
Reach-1	28.3	100yr	36500.00	996.00	1003.32	1002.34	1004.96	0.007384	10.31	3632.37	731.41	0.75

HEC-RAS Plan: Alt 2 River: RIVER-1 Reach: Reach-1 Profile: 100yr

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	29.64	100yr	33000.00	1041.30	1047.87	1047.05	1049.51	0.007337	10.27	3212.01	596.48	0.78
Reach-1	29.56	100yr	33000.00	1039.50	1045.65	1044.11	1046.89	0.005383	8.95	3685.31	615.05	0.64
Reach-1	29.53	100yr	33000.00	1038.00	1045.20	1042.87	1046.17	0.003551	7.91	4171.84	614.09	0.53
Reach-1	29.51	100yr	33000.00	1036.80	1044.73	1042.49	1045.64	0.003619	7.68	4295.97	671.54	0.54
Reach-1	29.505		Bridge									
Reach-1	29.5	100yr	33000.00	1036.00	1042.38	1041.88	1044.09	0.009995	10.48	3149.66	663.33	0.85
Reach-1	29.43	100yr	33000.00	1033.60	1040.59	1039.01	1041.85	0.005416	9.00	3666.62	612.09	0.65
Reach-1	29.37	100yr	33000.00	1031.60	1037.91	1037.38	1039.71	0.010051	10.77	3065.04	622.62	0.86
Reach-1	29.35	100yr	33000.00	1030.70	1036.52	1036.23	1038.48	0.011479	11.22	2942.21	620.41	0.91
Reach-1	29.32	100yr	33000.00	1030.00	1035.64	1034.70	1037.20	0.007815	10.04	3287.56	613.41	0.76
Reach-1	29.23	100yr	33000.00	1025.00	1032.86	1031.07	1033.93	0.004581	8.31	3972.50	659.31	0.60
Reach-1	29.19	100yr	33000.00	1024.00	1032.10	1029.82	1033.03	0.003548	7.74	4273.08	658.40	0.53
Reach-1	29.16	100yr	33000.00	1023.40	1031.49	1029.57	1032.56	0.004358	8.30	3974.96	635.97	0.59
Reach-1	29.14	100yr	33000.00	1022.90	1030.66	1029.30	1031.96	0.006036	9.15	3606.95	636.31	0.68
Reach-1	29.1	100yr	33000.00	1021.00	1028.06	1027.78	1030.07	0.011944	11.37	2901.58	617.95	0.92
Reach-1	29.08	100yr	33000.00	1020.50	1026.64	1026.64	1028.99	0.014144	12.32	2679.49	575.14	1.01
Reach-1	29.07	100yr	33000.00	1018.20	1026.09	1022.48	1026.70	0.001887	6.27	5264.80	684.31	0.40
Reach-1	29.06		Bridge									
Reach-1	29.01	100yr	33000.00	1018.20	1025.01	1022.49	1025.84	0.003090	7.29	4527.07	679.61	0.50
Reach-1	28.95	100yr	33000.00	1016.00	1023.97	1022.08	1024.88	0.004032	7.78	4878.72	881.33	0.56
Reach-1	28.84	100yr	33000.00	1013.00	1021.38	1019.72	1022.26	0.004972	7.53	4382.58	898.49	0.60
Reach-1	28.737	100yr	33000.00	1010.00	1018.93	1016.50	1019.88	0.003660	7.82	4217.89	646.36	0.54
Reach-1	28.673	100yr	33000.00	1007.30	1017.83	1014.35	1018.83	0.002585	8.10	4286.54	552.71	0.48
Reach-1	28.647	100yr	33000.00	1006.20	1017.54	1013.31	1018.48	0.002098	7.79	4271.11	460.47	0.44
Reach-1	28.63	100yr	33000.00	1005.60	1016.60	1013.28	1018.04	0.003497	9.62	3429.44	367.88	0.56
Reach-1	28.624	100yr	33000.00	1005.30	1016.46	1012.96	1017.91	0.003304	9.68	3408.88	346.47	0.54
Reach-1	28.617		Bridge									
Reach-1	28.616	100yr	33000.00	1004.98	1015.53	1013.59	1017.68	0.005895	11.75	2807.58	320.56	0.70
Reach-1	28.608	100yr	33000.00	1005.00	1015.28	1014.21	1017.56	0.008124	12.15	2736.49	373.00	0.79
Reach-1	28.606	100yr	33000.00	1004.90	1015.29	1013.81	1017.32	0.006773	11.46	2918.43	379.00	0.73
Reach-1	28.604	100yr	33000.00	1004.80	1015.27	1013.55	1017.16	0.006161	11.10	3028.83	385.00	0.70
Reach-1	28.602	100yr	33000.00	1004.70	1013.52	1013.52	1016.58	0.014065	14.16	2383.33	391.00	1.02
Reach-1	28.6	100yr	33000.00	1004.60	1013.38	1013.27	1016.31	0.013357	13.88	2439.56	397.00	0.99
Reach-1	28.597	100yr	33000.00	1004.20	1013.65	1011.75	1015.65	0.005597	11.48	2985.02	359.23	0.70
Reach-1	28.595	100yr	33000.00	1004.10	1013.59	1011.65	1015.57	0.005512	11.42	2999.57	359.43	0.69
Reach-1	28.59	100yr	33000.00	1004.00	1013.37	1011.55	1015.41	0.005752	11.58	2959.12	358.87	0.71
Reach-1	28.58	100yr	33000.00	1004.00	1013.21	1011.11	1015.01	0.004741	10.86	3203.66	414.82	0.65
Reach-1	28.57	100yr	36500.00	1003.70	1012.60	1011.08	1014.64	0.005922	11.56	3312.57	446.00	0.71
Reach-1	28.55	100yr	36500.00	1003.10	1012.17	1010.31	1013.89	0.005260	10.55	3523.03	484.69	0.66
Reach-1	28.53	100yr	36500.00	1002.50	1011.21	1010.29	1013.11	0.007996	11.07	3298.01	538.62	0.79
Reach-1	28.49	100yr	36500.00	1001.50	1010.06	1008.46	1011.66	0.005396	10.25	3752.26	555.18	0.67
Reach-1	28.43	100yr	36500.00	999.70	1007.82	1006.96	1009.77	0.007633	11.31	3477.09	672.82	0.78
Reach-1	28.38	100yr	36500.00	998.00	1006.27	1004.80	1007.86	0.005885	10.18	3806.98	731.27	0.69
Reach-1	28.3	100yr	36500.00	996.00	1003.32	1002.34	1004.96	0.007384	10.31	3632.37	731.41	0.75

Attachment 3 – Engineering "No Rise" Certificate

NATIONAL FLOOD INSURANCE PROGRAM
ENGINEERING "NO-RISE" CERTIFICATE

SITE INFORMATION

Community	San Bernardino Associated Governments (SANBAG)	County	San Bernardino County
Applicant	SANBAG	Date	08/30/12
Address	1170 W. 3rd St, San Bernardino, CA 92410	Engineer	Mark Seits, P.E., HDR Engineering, Inc.
		Address	8690 Balboa Ave, Suite 200, San Diego, CA 92123
Telephone	909-884-8276	Telephone	858-712-8312
Site Address/ Location	Santa Ana River Bridge 3.4 N34.07515 and W117.2721, California Coordinate System 1983 (ft), Zone 5	Township Section	

PROJECT INFORMATION

Description of Development: New bridge development with ties, subgrade and rails.

Type of Development: Filling ___ Grading _X_ Excavation _X__ Minor Improv ___
Substantial Improv _X_ New Construction ___ Other ___

FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

NFIP map(s) and panel(s) affected: FIRM Map Number- 06071C8684H
Effective date of map: August 28, 2008
Base Flood Elevation (feet): FEMA Effective ; Revised Existing 1017.6; Proposed 1017
Name of flooding source: Santa Ana River

CERTIFICATION

This is to certify that I am a duly qualified Professional Engineer licensed to practice in the State of California. I further certify that the attached engineering data supports the fact the proposed development in the floodway described above will not create any increase in the base flood elevations (100-year flood), floodway elevations and the floodway widths on Santa Ana River at published cross sections listed in the Flood Insurance Study for the above community dated August 28, 2008 and will not create any increase to the base flood elevations (100-year flood), floodway elevations and the floodway widths at unpublished cross-section in the vicinity of the proposed development.

Mark Seits, P.E.
CERTIFIER'S NAME

CA 41103
LICENSE NUMBER

HDR Engineering, Inc.
COMPANY NAME

SIGNATURE

August 30, 2012
DATE

Attachment 4 – Digital Information (CD)

U.S. Department
of Transportation
Federal Transit
Administration

REGION IX
Arizona, California,
Hawaii, Nevada, Guam
American Samoa,
Northern Mariana Islands

201 Mission Street
Suite 1650
San Francisco, CA 94105-1839
415-744-3133
415-744-2726 (fax)

MAY 1 2013

Mr. Kennon Corey
U. S. Fish and Wildlife Service, Southwest Region
777 E. Tahquitz Canyon Way, Suite 208,
Palm Springs, CA 92262

RE: Request for Consultation under Section 7 of the Endangered Species Act, Redlands Passenger Rail Project, San Bernardino County, California

Dear Mr. Corey:

The Federal Transit Administration (FTA), in conjunction with the project sponsor, the San Bernardino Associated Governments (SANBAG), is requesting formal consultation under Section 7(a)(2) of the Endangered Species Act (ESA) for the Redlands Passenger Rail Project (the project), located in southwestern San Bernardino County, California. We are also requesting concurrence with our determination of effects for the project, which is presented in the Biological Technical Report (BTR), enclosed with this letter. FTA is the lead agency for compliance with the National Environmental Protection Act (NEPA) for this project.

The project is intended to provide passenger rail service between the University of Redlands and E Street in the City of San Bernardino. The project will include the construction of five stations along the rail alignment, replacement of existing railroad tracks and ties, reconstruction or rehabilitation of existing bridge structures, construction of a train layover facility, and auxiliary improvements such as parking, at-grade roadway crossings and pedestrian access.

The BTR details potential impacts to listed species and federally-designated critical habitat resulting from the proposed action. The term "action area" is used below to define the portions of the proposed action area that will result in direct impacts to habitat occupied by federally listed species and federally-designated critical habitat or that have the potential to indirectly impact federally listed species.

As detailed in the enclosed BTR, the proposed action area intersects designated critical habitat for the federally endangered San Bernardino kangaroo rat (*Dipodomys merriami parvus*) and the federally threatened Santa Ana sucker (*Catostomus santaaneae*) at the Santa Ana River. The proposed action will impact approximately 2.85 acres of Unit 1 of San Bernardino kangaroo rat Critical Habitat, of which up to 0.70 acres may be permanent. These impacts may affect, but are not likely to adversely affect critical habitat for the species. The proposed action will also impact Santa Ana sucker Critical Habitat where the river provides a sediment source for occupied

habitat downstream. These impacts may affect, but are not likely to adversely affect critical habitat for the species. Focused surveys did not detect San Bernardino kangaroo rat within the action area and Santa Ana sucker is not anticipated to occur within the action area due to the lack of suitable habitat. Therefore, the proposed project is not likely to affect San Bernardino kangaroo rat or Santa Ana sucker.

As described in the enclosed BTR, suitable habitat also occurs within the action area in the vicinity of the Santa Ana River for the federally endangered Least Bell's vireo (*Vireo bellii pusillus*) and federally endangered Southwestern Willow flycatcher (*Empidonax traillii extimus*). Focused surveys did not detect Southwestern Willow flycatcher within the action area, therefore the proposed action is not likely to affect the species. As described in the enclosed BTR, focused surveys identified four Least Bell's vireo territories, including at least one nesting pair, in the vicinity of the proposed action. Based on the proximity of the nesting pair, the proposed action may affect, and is likely to adversely affect the Least Bell's vireo.

Additionally, a single federally endangered Santa Ana River woolly star (*Eriastrum densifolium ssp. sanctorum)* was observed within the proposed action area and, as described in the enclosed BTR, the proposed action may affect, and is likely to adversely affect, the Santa Ana River woolly star.

Based on these determinations, we request initiation of formal consultation under Section 7 of the ESA for the Least Bell's vireo and Santa Ana woolly star. Please contact Mr. Hymie Luden, City and Regional Planner, of my staff regarding this consultation request at (415) 744-2732.

Sincerely,

Leslie T. Rogers
Regional Administrator

Enclosure: Redlands Passenger Rail Project Biological Technical Report (March 2013)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Palm Springs Fish and Wildlife Office
777 East Tahquitz Canyon Way, Suite 208
Palm Springs, California 92262

In Reply Refer To:
FWS-SB-13B0313-13TA0380

AUG - 9 2013

Mr. Leslie T. Rogers
Regional Administrator
Federal Transit Authority
201 Mission Street, Suite 1650
San Francisco, California 94105-1839

Attention: Hymie Luden, City and Regional Planner

Subject: Formal Section 7 Consultation for Least Bell's Vireo and Santa Ana River Woolly-star for the Redlands Passenger Rail Project, San Bernardino County, California

Dear Mr. Rogers:

This letter acknowledges the receipt of your letter dated May 1, 2013, received by the Palm Springs Fish and Wildlife Office on May 6, 2013, requesting initiation of formal section 7 consultation to address impacts from the Redlands Passenger Rail Project (Project) under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). You have determined that the Project may affect, and is likely to adversely affect, the federally endangered least Bell's vireo (*Vireo bellii pusillus*, vireo) and Santa Ana River woolly-star (*Eriastrum densifolium* subsp. *Sanctorum,* woolly-star).

We received the draft biological technical report from HDR Engineering, Inc. (HDR) on May 28, 2013, and although comprehensive, it did not contain all the information needed to initiate formal consultation as outlined in the regulations governing interagency consultations (50 CFR §402.14). A site visit at the Project location was conducted on July 15, 2013, attended by the U.S. Fish and Wildlife Service (Service), California Department of Fish and Wildlife, and a Project representative from HDR, during which we discussed additional information necessary for the Service to initiate consultation. In order to complete the initiation package, we request the following information:

- A finalized biological technical report with the selected project design alternative and corresponding footprint acreage;

- A biological assessment identifying the listed species and critical habitat that may be present in the action area and an evaluation of project related direct and indirect effects to those species and/or critical habitat. The assessment of impacts should include a quantification of permanent and temporary impacts to woolly-star, vireo and designated vireo critical habitat and the permanent and temporary effects of project related noise to vireo;

- An assessment of potential impacts associated with the proposed diversion of the Santa Ana River away from the construction area and a detailed description of the method selected to accomplish the diversion. The assessment should include a hydrological analysis of the proposed diversion and any potential impacts to Santa Ana sucker critical habitat (i.e., changes to downstream movement of sand gravels or cobbles);

- A description of any minimization or avoidance measures to be implemented the benefit of woolly-star (e.g., seed collection prior to construction and active restoration following construction);

- A description of measures addressing the restoration/rehabilitation activities to be completed to minimize temporary and permanent impacts to vireo habitat, including proposed methodology, schedule for restoration activities, success criteria, and schedules for protocol presence/absence surveys in the restored areas following restoration. The restoration /rehabilitation measures can be provided separately in a draft Habitat Management Plan (HMP) or included in the biological assessment described above; and,

- A concurrence letter from U.S. Army Corps of Engineers confirming the Federal Transit Authority's designation as lead Federal agency for the section 7 consultation.

We will initiate formal consultation for the proposed Project after receiving the aforementioned information. Once we receive and review all the requested information, we will notify you of an estimated date by which we expect to complete the biological opinion. If you have any questions regarding this consultation or the consultation process in general, please contact William O'Neill of this office at 760-322-2070, extension 204.

Sincerely,

Kennon A. Corey
Assistant Field Supervisor

cc:
Adam Klein, Environmental Specialist, Federal Transit Authority
Clint Meyer, Senior Environmental Planner, HDR Engineering, Inc.
Shannon Pankratz, Regulatory Specialist, U.S. Army Corps of Engineers

U.S. Department
of Transportation
Federal Transit
Administration

REGION IX
Arizona, California,
Hawaii, Nevada, Guam
American Samoa,
Northern Mariana Islands

201 Mission Street
Suite 1650
San Francisco, CA 94105-1839
415-744-3133
415-744-2726 (fax)

DEC 12 2013

Mr. Kennon Corey
U. S. Fish and Wildlife Service, Southwest Region
777 E. Tahquitz Canyon Way, Suite 208,
Palm Springs, CA 92262
Attention: William O'Neill

Re: Section 7 Endangered Species Act Consultation, Redlands Passenger Rail Project, San Bernardino County, CA

Dear Mr. Corey:

The Federal Transit Administration (FTA) requested the initiation of Section 7 consultation with the US Fish and Wildlife Service (the Service) in our letter, dated May 1, 2013 for the Redlands Passenger Rail Project (the project), located in southwestern San Bernardino County, California. On July 15, 2013, a field walk of the project site was conducted with representatives of the Service, the California Department of Fish and Wildlife and a project representative from HDR, the consultant for the San Bernardino Associated Governments (SANBAG). On August 9, 2013, we received a letter from the Service requesting additional information before the Section 7 consultation could formally begin.

In accordance with your August 9, 2013 letter, we are providing the Service with the requested information. This information includes the following:

- A Final Biological Technical Report (BTR) – Sent to the Service on July 24, 2013;
- A Biological Assessment (BA) – See Enclosure;
- A discussion of hydrological effects within Santa Ana River during construction and post-construct – See pages 3-23 through 3-25 of the BA and Appendix I of the BA;
- Avoidance/Minimization Measures for Santa Ana River woolly star - See page 3-5 of the BA;
- A Habitat Management Plan (HMP) – See Section 4 of the BA; and
- Concurrence from the U. S. Army Corps of Engineers (USACE) that FTA will act as the lead Federal agency for the Section 7 Consultation – See Enclosure.

As documented in the attached BA, the determination of effects to federally listed species are summarized below:

- least Bells vireo (*Vireo bellii pusillus*, FE) - likely to adversely affect;
- San Bernardino kangaroo rat (*Dipodomys merriami parvus,* FE) - not likely to affect;
- Santa Ana sucker (*Catostomus santaaneae*, FT) - not likely to affect;
- Southwestern willow flycatcher (*Empidonax traillii extimus,* FE) - not likely to affect; and

- Santa Ana River woolly star (*Eriastrum densifolium ssp. sanctorum,* FE*)* - likely to adversely affect.

As described in our May 1, 2013 letter (enclosed), the project encompasses an approximately nine mile corridor extending east from the City of San Bernardino to the City of Redlands within the southwestern corner of the County of San Bernardino. The project extends along an existing railroad right-of-way owned by SANBAG, and the project is intended to provide passenger rail service between the University of Redlands and E Street in the City of San Bernardino. The project will include the construction of five stations along the rail alignment, replacement of existing railroad tracks and ties, reconstruction or rehabilitation of existing bridge structures, construction of a train layover facility, and auxiliary improvements such as parking, at-grade roadway crossings and pedestrian access.

As the lead federal agency under the National Environmental Protection Action (NEPA), FTA requests that the Service initiate Section 7 consultation for the project and that the Service concur with these findings of effect. Should you have any questions regarding our request, please contact Dominique Paukowits, FTA Community Planner, at (415) 744-2735. Thank you for your cooperation in this matter.

Sincerely,

Leslie T. Rogers
Regional Administrator

Enclosures: November 2013 Biological Assessment, Redlands Passenger Rail Project
August 21, 2013 Email from Shannon Pankratz, US Army Corps of Engineers
August 9, 2013 Letter from Kennon A. Corey (Assistant Field Supervisor, USFWS) to Leslie T. Rogers (Regional Administrator, FTA Region IX)
May 1, 2013 Letter from Leslie T. Rogers to Kennon A. Corey

cc: Mitch Alderman, SANBAG (via email)
Clint Meyer, HDR (via email)

Governments
SANBAG
Working Together

San Bernardino Associated Governments

1170 W. 3rd Street, 2nd Fl, San Bernardino, CA 92410
Phone: (909) 884-8276 Fax: (909) 885-4407
Web: www.sanbag.ca.gov

TRANSPORTATION MEASURE I

•San Bernardino County Transportation Commission •San Bernardino County Transportation Authority
•San Bernardino County Congestion Management Agency •Service Authority for Freeway Emergencies

November 21, 2013

Raymond Sukys
Federal Transit Administration, Region 9
201 Mission St., Suite 1650
San Francisco CA 94105

Subject: Redlands Passenger Rail Project – Request to Initiate Formal Section 7 Consultation

Dear Mr. Sukys,

The San Bernardino Associated Governments (SANBAG) is proposing the Redlands Passenger Rail Project (project) to address the transit needs of the Redland Corridor consistent with SANBAG's Measure I Strategic Plan and the Southern California Association Governments' (SCAG) Regional Transportation Plan (2012). SANBAG plans to pursue federal funding for the project from the Federal Transit Administration (FTA), Region 9, and as a result, is currently preparing a joint Environmental Impact Statement and Environmental Impact Report (EIS/EIR) with FTA for the project.

As part of FTA's role as the federal lead agency under the National Environmental Policy Act (NEPA), FTA is required to consult with other federal agencies that have jurisdiction by law over one or more aspects of the project. This includes the U. S. Fish and Wildlife Service (USFWS), which is responsible for regulating the 'take" of federally threatened and endangered species. Based on the findings of a Biological Assessment (November 2013) prepared for the project, there is a potential for project-related activities to result in direct and indirect impacts to habitat occupied by federally listed species and federally-designated critical habitat. The BA specifically concluded that the project is not likely to affect the Federally endangered (FE) San Bernardino kangaroo rat (*Dipodomys merriami parvus*), Federally threatened (FT) Santa Ana sucker (*Catostomus santaaneae*), and FE Southwestern willow flycatcher (*Empidonax traillii extimus*). The BA also concluded that the project is likely to adversely affect the FE least Bells vireo (*Vireo bellii pusillus*) and FE Santa Ana River woolly star (*Eriastrum densifolium* ssp. *sanctorum*).

Based on these findings, SANBAG hereby requests that FTA initiate formal consultation with the USFWS per the requirements of Section 7 of the Endangered Species Act for the least Bell's vireo and Santa Ana woolly star. Please contact Mr. Justin Fornelli, Chief of Rail and Transit, or myself with any questions regarding this request at (909) 884-8276.

Sincerely,

Mitchell A. Alderman

Mitchell A. Alderman, P.E.
Director of Transit and Rail Programs

cc: Justin Fornelli, SANBAG
Mike Boraks, HDR
Clint Meyer, HDR

RS132111-maa

Klein, Adam CTR (FTA)

From: Pankratz, Shannon L SPL <Shannon.L.Pankratz@usace.army.mil>
Sent: Wednesday, August 21, 2013 9:33 AM
To: Klein, Adam CTR (FTA); Clint.Meyer@hdrinc.com
Subject: RE: Redlands Passenger Rail Project (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hello Adam,

We concur the Federal Transit Authority (FTA) would be the lead federal agency for the Section 7 consultation process with USFWS for the Redlands Passenger Rail Project, as FTA is the lead federal agency under NEPA. In cooperation and coordination with FTA, it is appropriate for FTA as the lead Federal agency to act on the Corps' behalf to ensure the impacts associated with our federal action(s) are adequately addressed in the overall Section 7 coordination.

Thanks,
Shannon

Shannon Pankratz
U.S. Army Corps of Engineers, Regulatory Division
915 Wilshire, Suite 13060
Los Angeles, CA 90017
Phone: 213.452.3412
Fax: 213.452.4196
Assist us in better serving you!
You are invited to complete our customer survey, located at the following link: http://per2.nwp.usace.army.mil/survey.html
Note: If the link is not active, copy and paste it into your internet browser.

-----Original Message-----
From: adam.klein.ctr@dot.gov [mailto:adam.klein.ctr@dot.gov]
Sent: Tuesday, August 20, 2013 5:06 PM
To: Pankratz, Shannon L SPL; Clint.Meyer@hdrinc.com
Subject: [EXTERNAL] FW: Redlands Passenger Rail Project

Shannon - per our conversation on the phone today, here is the original email from USFWS with their letter requesting a concurrence letter from USACE regarding designating FTA as lead agency for the Section 7 consultation process. As we discussed, since we are still in the EIS preparation phase, USACE would not be involved in the project at this stage, and it is appropriate for FTA to be the lead federal agency for the Section 7 consultation with USFWS.

I will get back in touch with USFWS and provide them with this information. Thanks again for your help on this challenging and exciting project.

Adam

Adam Klein

Senior Environmental Specialist

Resource Management Concepts, Inc., supporting

Federal Transit Administration Region IX

201 Mission Street, Suite 1650

San Francisco, CA 94105

Tel: 415-744-0141

From: Morales, Jackie [mailto:jackie_morales@fws.gov]
Sent: Monday, August 12, 2013 11:55 AM
To: Klein, Adam CTR (FTA); clint.meyer@hdrinc.com; shannon.l.pankratz@usace.army.mil
Cc: Karin Cleary-Rose; William O'Neill
Subject: Redlands Passenger Rail Project

Please see attachment for Formal Section 7 Consultation for Least Bell's Vireo and Santa Ana River Woolly-star

for the Redlands Passenger Rail Project, San Bernardino County, California.

Thank you

Jackie Morales

Secretary

Palm Springs Fish and Wildlife Office

777 E. Tahquitz Canyon Way, Suite 208

Palm Springs, California 92262

Office 760-322-2070

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Palm Springs Fish and Wildlife Office
777 East Tahquitz Canyon Way, Suite 208
Palm Springs, California 92262

In Reply Refer To:
FWS-SB-13B0313-13TA0380

AUG - 9 2013

Mr. Leslie T. Rogers
Regional Administrator
Federal Transit Authority
201 Mission Street, Suite 1650
San Francisco, California 94105-1839

Attention: Hymie Luden, City and Regional Planner

Subject: Formal Section 7 Consultation for Least Bell's Vireo and Santa Ana River Woolly-star for the Redlands Passenger Rail Project, San Bernardino County, California

Dear Mr. Rogers:

This letter acknowledges the receipt of your letter dated May 1, 2013, received by the Palm Springs Fish and Wildlife Office on May 6, 2013, requesting initiation of formal section 7 consultation to address impacts from the Redlands Passenger Rail Project (Project) under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). You have determined that the Project may affect, and is likely to adversely affect, the federally endangered least Bell's vireo (*Vireo bellii pusillus*, vireo) and Santa Ana River woolly-star (*Eriastrum densifolium* subsp. *Sanctorum,* woolly-star).

We received the draft biological technical report from HDR Engineering, Inc. (HDR) on May 28, 2013, and although comprehensive, it did not contain all the information needed to initiate formal consultation as outlined in the regulations governing interagency consultations (50 CFR §402.14). A site visit at the Project location was conducted on July 15, 2013, attended by the U.S. Fish and Wildlife Service (Service), California Department of Fish and Wildlife, and a Project representative from HDR, during which we discussed additional information necessary for the Service to initiate consultation. In order to complete the initiation package, we request the following information:

- A finalized biological technical report with the selected project design alternative and corresponding footprint acreage;

- A biological assessment identifying the listed species and critical habitat that may be present in the action area and an evaluation of project related direct and indirect effects to those species and/or critical habitat. The assessment of impacts should include a quantification of permanent and temporary impacts to woolly-star, vireo and designated vireo critical habitat and the permanent and temporary effects of project related noise to vireo;

- An assessment of potential impacts associated with the proposed diversion of the Santa Ana River away from the construction area and a detailed description of the method selected to accomplish the diversion. The assessment should include a hydrological analysis of the proposed diversion and any potential impacts to Santa Ana sucker critical habitat (i.e., changes to downstream movement of sand gravels or cobbles);

- A description of any minimization or avoidance measures to be implemented the benefit of woolly-star (e.g., seed collection prior to construction and active restoration following construction);

- A description of measures addressing the restoration/rehabilitation activities to be completed to minimize temporary and permanent impacts to vireo habitat, including proposed methodology, schedule for restoration activities, success criteria, and schedules for protocol presence/absence surveys in the restored areas following restoration. The restoration /rehabilitation measures can be provided separately in a draft Habitat Management Plan (HMP) or included in the biological assessment described above; and,

- A concurrence letter from U.S. Army Corps of Engineers confirming the Federal Transit Authority's designation as lead Federal agency for the section 7 consultation.

We will initiate formal consultation for the proposed Project after receiving the aforementioned information. Once we receive and review all the requested information, we will notify you of an estimated date by which we expect to complete the biological opinion. If you have any questions regarding this consultation or the consultation process in general, please contact William O'Neill of this office at 760-322-2070, extension 204.

Sincerely,

Kennon A. Corey
Assistant Field Supervisor

cc:
Adam Klein, Environmental Specialist, Federal Transit Authority
Clint Meyer, Senior Environmental Planner, HDR Engineering, Inc.
Shannon Pankratz, Regulatory Specialist, U.S. Army Corps of Engineers

U.S. Department
of Transportation
**Federal Transit
Administration**

REGION IX
Arizona, California,
Hawaii, Nevada, Guam
American Samoa,
Northern Mariana Islands

201 Mission Street
Suite 1650
San Francisco, CA 94105-1839
415-744-3133
415-744-2726 (fax)

MAY 1 2013

Mr. Kennon Corey
U. S. Fish and Wildlife Service, Southwest Region
777 E. Tahquitz Canyon Way, Suite 208,
Palm Springs, CA 92262

RE: Request for Consultation under Section 7 of the Endangered Species Act, Redlands Passenger Rail Project, San Bernardino County, California

Dear Mr. Corey:

The Federal Transit Administration (FTA), in conjunction with the project sponsor, the San Bernardino Associated Governments (SANBAG), is requesting formal consultation under Section 7(a)(2) of the Endangered Species Act (ESA) for the Redlands Passenger Rail Project (the project), located in southwestern San Bernardino County, California. We are also requesting concurrence with our determination of effects for the project, which is presented in the Biological Technical Report (BTR), enclosed with this letter. FTA is the lead agency for compliance with the National Environmental Protection Act (NEPA) for this project.

The project is intended to provide passenger rail service between the University of Redlands and E Street in the City of San Bernardino. The project will include the construction of five stations along the rail alignment, replacement of existing railroad tracks and ties, reconstruction or rehabilitation of existing bridge structures, construction of a train layover facility, and auxiliary improvements such as parking, at-grade roadway crossings and pedestrian access.

The BTR details potential impacts to listed species and federally-designated critical habitat resulting from the proposed action. The term "action area" is used below to define the portions of the proposed action area that will result in direct impacts to habitat occupied by federally listed species and federally-designated critical habitat or that have the potential to indirectly impact federally listed species.

As detailed in the enclosed BTR, the proposed action area intersects designated critical habitat for the federally endangered San Bernardino kangaroo rat (*Dipodomys merriami parvus*) and the federally threatened Santa Ana sucker (*Catostomus santaanae*) at the Santa Ana River. The proposed action will impact approximately 2.85 acres of Unit 1 of San Bernardino kangaroo rat Critical Habitat, of which up to 0.70 acres may be permanent. These impacts may affect, but are not likely to adversely affect critical habitat for the species. The proposed action will also impact Santa Ana sucker Critical Habitat where the river provides a sediment source for occupied

habitat downstream. These impacts may affect, but are not likely to adversely affect critical habitat for the species. Focused surveys did not detect San Bernardino kangaroo rat within the action area and Santa Ana sucker is not anticipated to occur within the action area due to the lack of suitable habitat. Therefore, the proposed project is not likely to affect San Bernardino kangaroo rat or Santa Ana sucker.

As described in the enclosed BTR, suitable habitat also occurs within the action area in the vicinity of the Santa Ana River for the federally endangered Least Bell's vireo (*Vireo bellii pusillus*) and federally endangered Southwestern Willow flycatcher (*Empidonax traillii extimus*). Focused surveys did not detect Southwestern Willow flycatcher within the action area, therefore the proposed action is not likely to affect the species. As described in the enclosed BTR, focused surveys identified four Least Bell's vireo territories, including at least one nesting pair, in the vicinity of the proposed action. Based on the proximity of the nesting pair, the proposed action may affect, and is likely to adversely affect the Least Bell's vireo.

Additionally, a single federally endangered Santa Ana River woolly star (*Eriastrum densifolium ssp. sanctorum)* was observed within the proposed action area and, as described in the enclosed BTR, the proposed action may affect, and is likely to adversely affect, the Santa Ana River woolly star.

Based on these determinations, we request initiation of formal consultation under Section 7 of the ESA for the Least Bell's vireo and Santa Ana woolly star. Please contact Mr. Hymie Luden, City and Regional Planner, of my staff regarding this consultation request at (415) 744-2732.

Sincerely,

Leslie T. Rogers
Regional Administrator

Enclosure: Redlands Passenger Rail Project Biological Technical Report (March 2013)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Palm Springs Fish and Wildlife Office
777 East Tahquitz Canyon Way, Suite 208
Palm Springs, California 92262

In Reply Refer To:
FWS-SB-13B0313-14TA0145

JAN 31 2014

Mr. Leslie T. Rogers
Regional Administrator
Federal Transit Administration
201 Mission Street, Suite 1650
San Francisco, CA 94105-1839

Attention: Ms. Dominique Paukowits, FTA Community Planner

Subject: Initiation of Formal Section 7 Consultation for least Bell's vireo and Santa Ana woolly-star for The Redlands Passenger Rail Project, San Bernardino County, California

Dear Mr. Rogers:

This letter acknowledges the receipt of your letter dated December 12, 2013, received by the Palm Springs Fish and Wildlife Office on Dec. 16, 2013, re-requesting initiation of formal section 7 under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). The consultation concerns the possible effects of the construction, operations and maintenance of the Redlands Passenger Rail Project (Project) on the federally endangered least Bell's vireo (*Vireo bellii pusillus*) and the Santa Ana woolly-star (*Eriastrium densifolium ssp sanctorum*).

On May 6, 2013, the Palm Springs Fish and Wildlife Office received your initial letter requesting section 7 consultation. Following a Project site visit on July 15, 2013, with the US Fish and Wildlife Service (Service), HDR, Inc., San Bernardino Associated Governments (SANBAG), and California Department of Fish and Wildlife (CDFW), issues were discovered that needed to be addressed prior to the Service initiating consultation. On August 9, 2013, the Service responded to your letter requesting additional information to complete the Section 7 initiation package for the Project. On January 7, 2014, the updated biological assessment was received by the Service.

Sufficient information to initiate consultation was contained in the documents provided or is otherwise accessible for our consideration and reference, therefore consultation was initiated on January 7, 2014. Section 7 of the Act allows us up to 90 days to conclude formal consultation with your agency and an additional 45 days to prepare our biological opinion (unless we mutually agree to an extension). We expect to issue the biological opinion on or before May 22, 2014. Please refer to file number FWS-SB-13B0313-14F0146 in any future correspondence for this consultation.

Although we have adequate information to initiate formal consultation, we may request clarification of project details during the consultation period. Please note that after initiation of formal consultation, the Act requires that the Federal action agency make no irreversible or irretrievable commitment of resources that limits future options. This practice ensures that agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitat.

We appreciate the opportunity to comment on this proposed action. If you have questions, please contact William O'Neill of this office at 760-322-2070, extension 204.

Sincerely,

Kennon A. Corey
Assistant Field Supervisor

cc:
Clint Meyer, HDR Inc
Kim Freeburn, CDFW
Mitch Alderman, SANBAG
Justin Fornelli, SANBAG

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Palm Springs Fish and Wildlife Office
777 East Tahquitz Canyon Way, Suite 208
Palm Springs, California 92262

In Reply Refer To:
FWS-SB-13B0313-14F0146

Mr. Leslie T. Rogers
Regional Administrator
Federal Transit Administration
201 Mission Street, Suite 1650
San Francisco, CA 94105-1839

Attention: Ms. Dominique Paukowits, FTA Community Planner

Subject: DRAFT Formal Section 7 Consultation for the proposed Redlands Passenger Rail Project, San Bernardino County, California

Dear Mr. Rogers:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the Redlands Passenger Rail Project (Project) and its effects on the federally endangered least Bell's vireo (*Vireo bellii pusillus*, vireo) and the federally endangered Santa Ana River woolly-star (*Eriastrum densifolium* subsp. *sanctorum*, woolly-star) in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq*.). San Bernardino County Associated Governments (SANBAG) is the non-Federal applicant (Applicant).

This biological opinion does not address critical habitat for vireo nor does it address three federally listed species with ranges that include the larger project vicinity: federally endangered San Bernardino kangaroo rat *(Dipodomys merriami parvus*), the federally threatened Santa Ana sucker (*Catostomus santaanae*), or the federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*; flycatcher). In the letter requesting initiation, your agency—the Federal Transportation Administration (FTA), indicated that the Project is not likely to affect these species. We do not expect San Bernardino kangaroo rat, Santa Ana sucker, or flycatcher to be present in the project area, and Project impacts to their respective designated critical habitats will be temporary and not significant. We therefore do not consider them further in this biological opinion.

This biological opinion is based on the following information: (1) *Biological Technical Report for Redlands Passenger Rail Project* (BTR, HDR 2013a); (2) *Biological Assessment for Redlands Passenger Rail Project* (HDR 2013b); (3) *San Bernardino Kangaroo Rat (Dipodomys merriami parvus) Habitat Assessment & Focused Survey Report (TDA 2012);* (4) *Results of a*

Focused Rare Plant Survey (HDR 2013b); (5) *Redlands Passenger Rail Project Draft Environmental Impact Statement / Environmental Impact Report;* and (6) other information in our files. In addition, information was provided during informal consultation at a site visit and meeting, and by written correspondence, electronic mail, telephone conversations, and other sources of information compiled during the course of discussions. A complete record of this consultation is on file at the Carlsbad Fish and Wildlife Office (CFWO).

CONSULTATION HISTORY

On May 1, 2013, the Palm Springs Fish and Wildlife Office (PFWO) received your letter requesting initiation of formal consultation under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*), to address impacts from the proposed federal action. On May 28, 2013, we received the draft biological technical report for the Project. During a site visit on July 15, 2013, attended by the Service, HDR, Inc., San Bernardino Associated Governments (SANBAG), and California Department of Fish and Wildlife (CDFW), biological concerns were identified. On August 9, 2013, the Service responded to your letter, requesting additional information to complete the Section 7 initiation package for the Project. The biological assessment (BA), dated November 2013 was received by the Service on January 7, 2014.

We received a letter on December 12, 2013, re-requested initiation of formal Section 7 consultation. Sufficient information to initiate consultation was contained in the documents provided or is otherwise accessible for our consideration and reference, therefore consultation was initiated on January 7, 2014. Due to workload and staffing constraints within our office we requested and received a 60-day extension on the due date for the biological opinion by the Federal Transit Administration (FTA), and subsequently two separate 30-day extensions.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Redlands Passenger Rail Project proposes commuter rail improvements along the approximately nine-mile Redlands Corridor from the City of San Bernardino east to the City of Redlands in southwestern corner of San Bernardino County, California. These improvements will facilitate an increase in rail traffic from five trips per week to 25 trips per day (22 trips during daylight hours and three during evening hours). The Project right-of-way is owned by SANBAG and includes the existing rail and adjacent areas from E Street in San Bernardino to just east of University Avenue near the University of Redlands in the city of Redlands. The Project will facilitate passenger service along this route with five station stops. Four new station stops will be constructed in conjunction with the Project. From the west to the east station stops will be at Tippecanoe Avenue or Waterman Avenue within the City of San Bernardino, and New York Street, Orange Street, and University Street within the City of Redlands. The Fifth station stop will be constructed at E Street and is associated with a different project - the Downtown San Bernardino Passenger Rail Project. A layover facility just south of Interstate 10 freeway and

west of California Street, which would contain up to seven tracks, is also proposed. Light rail maintenance activities and operational activities including the storage of trains will be carried out at this facility.

Project activities involve the demolition and replacement of the existing track, the track ballast, and the sub-grade along the nine-mile corridor. The new track will be generally reconstructed to 50 feet in width and all construction activities will be confined to this area. Exceptions will be at bridge crossings and where development constrains the track width. Track improvements are proposed to include the installation of new continuously welded rail on concrete ties and new ballast and sub-ballast sections throughout the rail corridor. Additional proposed activities include the replacement or retrofitting of structural crossings and bridges, installation of redesigned roadway grade crossings and signaling, addition of rail platforms, addition of a train layover facility, utility replacement and relocation, drainage facility improvements, and railroad right-of-way maintenance. Construction is proposed to start in 2015 and take up to 36 months to complete and would proceed from the west to the east.

The Project will require replacement or retrofitting of crossings at Warm Creek, Twin Creek, the Santa Ana River (SAR), Mission Zanja Flood Control Channel, and Mill Creek Zanja for the purpose of facilitating increased loading requirements of passenger trains. Crossings vary from 40 to 100 feet in width and are expected to impact 3.47 acres of southern willow scrub (temporary impacts, 0.10 acres; permanent impacts, 0.02 acres) and southern cottonwood willow riparian forest (temporary impacts, 2.83 acres; permanent impacts, 0.52 acres). Vireo and woolly-star are present at the SAR crossing location, which includes both the SAR and Mission Zanja Flood Control Channel crossing. A majority of the riparian impacts will also occur at the SAR crossing. The Project will also have both temporary (6.46 acres) and permanent (0.29 acres) impacts to waters of the United States.

Santa Ana River Crossing

The existing bridge at the SAR will be widened by 20 feet and lengthened by approximately 70 feet. The bridge abutment cone will be graded, blended and re-contoured to match the riverbank slopes to the greatest extent practicable. Armoring is anticipated at the abutments and will use either riprap or articulated concrete block matting. The existing bridge piers will be removed and replaced with longer piers to accommodate the increased bridge width. Existing bridge piers will be removed after installation of the new bridge foundation. Construction activities within the SAR during periods when the river is flowing may require the installation of a cofferdam and/or construction work pad to isolate the work area within the wetted portions of the river. In addition, it may be necessary to conduct such work during the nesting season. The Project requires a permit from the United States Army Corps of Engineers for impacts to waters of the United States. For the proposed action, the FTA is the lead for the Section 7 consultation process with the Service.

This consultation analyzed the impacts associated with the reconstruction of a single set of

railroad tracks. The increase in pier length proposed by the Applicant is to allow a second set of tracks to be constructed at a later date. The second track is not anticipated to be constructed in the foreseeable future and impacts associated with a second rail were not analyzed in this biological opinion.

Conservation Measures

The measures identified below have been incorporated into the proposed Project for the purpose of offsetting or avoiding and/or minimizing impacts to the vireo in the action area.

1. Access roads and construction areas that are off of existing paved surfaces will be clearly flagged prior to construction activities.

2. Within the construction footprint, areas to remain undisturbed will be clearly flagged or otherwise delineated prior to any construction activities. A biological monitor will be on site to monitor all activities that result in the removal of sediment or vegetation and ensure that these activities do not encroach into the delineated avoidance areas. The biological monitor will have the authority to halt Project activities occurring outside of designated construction areas.

3. All permanent impacts to suitable vireo habitat (0.96 acres) and temporary impacts to occupied vireo habitat within Mission Zanja Channel (0.14 acres) will be replaced at a ratio of 3:1 (2.88 + 0.42 = 3.30 acres). Additional temporary impacts to suitable vireo habitat within Mission Zanja Channel (0.60 acres) will be replaced at a ratio of 2:1 (1.20 acres). All 1.70 acres of permanent and temporary impacts to suitable vireo habitat will be compensated through an in-lieu fee payment to an appropriate conservation bank for the establishment of 4.50 acres of vireo habitat located within the Santa Ana River Watershed. SANBAG will provide the Service with proof of purchase of credits for 4.5 acres of vireo habitat in the SAR above Prado dam, prior to ground breaking or vegetation removal activities.

4. All temporarily impacted riparian habitat areas will be restored to pre-grade contours following the completion of construction activities. To minimize soil erosion a Service pre-approved native seed mix, including locally occurring shrub species, will be broadcast over the areas via hand-seeding or hydroseeding and allowed to revegetate naturally. These areas will be monitored and maintained for five years, until vireo is documented using the re-established habitat or until habitat attains 80 percent cover (shrub and tree canopy). If recruitment of woody riparian plant species is not evident within two years of project construction or habitat has not attained 60 percent cover within three years, impacts will be treated as permanent and additional conservation acreage for areas not meeting success criteria shall be provided through in-lieu fee payment to an appropriate conservation bank in the Santa Ana River Watershed at a ratio of 1:1.

5. Vegetation removal will be conducted between September 15 and March 15 (outside of the vireo nesting season).

6. When construction activities occur on the southern bank of the of the SAR in the period between March 15 and August 15 (vireo nesting season), the FTA or SANBAG will require a qualified biologist to survey any potential vireo habitat within 500 feet of the active work area weekly during the breeding season. In the event that vireo nesting activity is detected within 500 feet of the work area, if feasible a 500 foot buffer will be established between the construction area and the approximate edge of the vireo territory, to avoid affects to nesting vireo. If this is not possible, construction noise will be reduced so as to not exceed 60 decibels at the approximate edge of the vireo territory, with the use of noise attenuation structures. These structures will remain in place until all nestlings have fledged or construction activities have moved 500 feet beyond that are of vireo activity.

7. A qualified biologist (or environmental monitor) will monitor construction activities to ensure compliance with environmental commitments, which include:

    a. Prior to construction activities, a qualified biologist will conduct pre-construction training for all construction crew members. The training will focus on required mitigation measures and conditions of regulatory agency permits and include a summary of sensitive species and habitats potentially present within and adjacent to the proposed Project site and staging areas, including both southern cottonwood willow riparian forest and southern willow scrub habitat and the potential use of these habitats by vireo.

    b. Immediately prior to construction activities and throughout any portion of the construction period that takes place during the vireo breeding season, a qualified biologist will inspect the construction site and adjacent areas (using non-protocol surveys) to determine if any vireos are nesting within 500 feet of the construction site. If active nests are found, the biologist will coordinate with the Service and/or the CDFW to determine appropriate avoidance and/or minimization measures.

    c. Monitoring to ensure that construction noise at vireo use areas is maintained at less than 60 decibels until all nestlings have fledged.

8. SANBAG will submit a final report to the PSFWO within 30 days of completing the Project. This report will include a summary of all Project activities conducted within the action area including, timing and duration of activities, methods and equipment used to conduct activities, quantity and type of sediment and/or vegetation removed, total area of impacts, a map identifying locations of activities, a list of avoidance and minimization

measures implemented during activities, and before and after photographs of temporary impact areas.

The measures identified below have been incorporated into the proposed Project for the purpose of avoiding and/or minimizing vireo effects downstream of the Project and/or within the surrounding watershed.

9. Equipment will be in proper working condition and inspected for leaks and drips on a daily basis prior to commencement of any in-channel work during construction activities.

10. A spill prevention and remediation plan will be developed and implemented during construction and operation activities. Workers will be instructed as to the requirements listed in the plan. Construction supervisors and workers and maintenance personnel will be instructed to (1) be alert for indications of equipment-related contamination such as stains and odors, and (2) respond immediately with appropriate actions as detailed in the spill prevention and remediation plan if indications of equipment-related contamination are noted.

11. Sediment barriers (e.g., sandbags, silt fence, temporary containment dam) will be placed downstream of each major construction operation to prevent downstream sedimentation.

12. Areas of exposed soil, dirt stockpiles, dirt berms, and temporary dirt roads will be stabilized with controlled amounts of sprinkled water during construction.

13. Construction wastes and will be contained and disposed of away from the Project construction sites.

14. Vehicles and equipment storage shall occur away from waterways in pre-determined staging areas.

15. Project-related vehicle traffic shall be restricted to established roads and areas used for construction, storage, staging, or parking.

16. Refueling and maintenance of equipment and vehicles will be prohibited within 50 feet of waterways during construction activities.

17. Spill kits containing absorbent materials will be kept at the Project site during construction activities.

18. Fuels and other hazardous materials will be stored in designated areas away from drainage areas.

These conservation measures have been included in the project description for the purpose of

avoiding and minimizing Project impacts to woolly-star.

19. Prior to construction activities, a qualified biologist will conduct pre-construction surveys within appropriate habitat in the SAR and Mission Zanja Channel for federally listed plant species occurring in the Project area. If additional woolly-star plants or other listed plant species are located within the action area then the Applicant will contact the Service immediately.

20. Prior to construction activities, the Applicant will erect exclusionary construction fencing creating a five-foot buffer around the perimeter of the woolly-star plant. Exclusionary fencing will be maintained throughout the construction period unless it is necessary to remove the plant for the creation of a cofferdam and/or construction work pad. Exclusionary fencing will be removed at the conclusion of construction work in that area as approved by the biological monitor.

21. Seeds from the closest known occurrences of woolly-star plants found both upstream and downstream of the Project area in the SAR shall be collected in the fall prior to construction of the SAR crossing. If construction activities require the loss of the single wooly-star at the SAR crossing, the collected seeds will be broadcast in the temporary impact areas, near the impacted woolly-star plant, after construction activities are complete and soils have been restored to pre-Project contours.

    a. Seed collection and broadcast methodologies will be proposed by a qualified seed collector approved by the Service prior to seed collection in a Santa Ana Woolly-Star Management Plan.

    b. Seed harvest shall be from a minimum of three plants per collection location, limited to no more than 50 percent of the available seeds from any one woolly-star plant.

    c. Seeds shall be held at the appropriate temperature and humidity for the shortest length of time necessary prior to planting.

    d. Planting of seeds shall be coordinated to occur prior to the first rains of the season, typically during early fall.

    e. If the woolly-star plant known in the Project area is avoided, collected seeds will be hand broadcast near the parental plants where they were collected.

22. Woolly-star seedlings will be monitored and maintained for a period of two years to maximize successful establishment in all planted areas. At minimum, one flowering individual shall be required to satisfy this measure. If no plants are established during this two year period, replanting in the impact area, off-site restoration, or purchase of mitigation

credits will be required. This conservation measure is exempt in the event no impact to a woolly-star plant occurs.

Action Area

According to 50 CFR § 402.2, pursuant to section 7 of the Act, the "action area" includes all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. Areas subject to direct effects include all those areas within the Project footprint including construction vehicle access routes, staging areas, and maintenance areas. Indirect effects include degradation of adjacent occupied vireo habitat from construction activities and edge effects. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based on the action area as determined by our agency. We have defined the action area to include the approximately nine-mile Redlands Corridor from the City of San Bernardino east to the City of Redlands, with a 500-foot buffer to account for those areas where we anticipate project-related effects such as increased noise, light, dust levels and human activity during construction of the Project. To encompass indirect effects from Project impacts to water crossings, the action area was extended downstream to the next confluence for each crossing.

STATUS OF THE SPECIES

Least Bell's vireo

The following section summarizes information about the federally endangered Least Bell's vireo relative to its legal status and biology. For detailed information on the vireo's biology, ecology, rangewide status, threats, and conservation needs, please refer to the draft recovery plan (Service 1998) and 5-year review (Service 2006). Additional information is also available in the final rule designating critical habitat for vireo (59 FR 4845). These documents are available on the internet at: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B067

The vireo was listed as endangered on May 2, 1986 (51 FR 16474), in response to a dramatic decline in population and widespread loss of riparian habitat. Critical habitat for vireo was designated on February 3, 1994. A draft recovery plan was published in March 1998 (Service 1998), though a final plan has not been issued. We completed a 5-year review for vireo in September 2006 in which we indicated that, due to new information on the species and an improved understanding of ongoing recovery actions to reduce threats, the recovery goals and strategies should be modified and refined. In addition, we recommended that the vireo be down-listed from endangered status to threatened status because of a ten-fold increase in population size since its listing in 1986, expansion of locations with breeding vireo throughout southern California, and conservation and management of suitable breeding habitat throughout its range (Service 2006).

The vireo historically occupied willow riparian habitats from Tehama County in northern

California, southward to northwestern Baja California, Mexico, and as far east as Owens Valley, Death Valley, and the Mojave River (Grinnell and Miller 1944, Service 1998). Greater than 99 percent of the remaining vireos occur in southern California, south of the Tehachapi Mountains (Service 2006). Thus, despite a significant increase in overall population numbers, and a slight shift northward in the species overall distribution, the population remains restricted to the southern portion of its historic range (Service 2006).

Vireos use a number of riparian habitat types, including cottonwood-willow woodlands/forests, oak woodlands, and mule fat scrub. However, vegetation structure is an important determinant of vireo site use. The vireo is an obligate riparian species during the breeding season, and prefers diverse early successional riparian habitat. Early successional riparian vegetation typically supports the dense shrub cover required for nesting and also a structurally diverse canopy for foraging (Service 1998). Occupied breeding habitat generally includes dense cover within 3 to 6 feet of the ground for nesting and a dense, stratified canopy for foraging. Plant species composition does not appear as important a determinant in nesting site selection as habitat structure. As riparian vegetation matures, the tall stands tend to shade out the shrub layer, making the sites less suitable for vireo nesting. In addition, vireo nests tend to occur in openings and along the riparian edge, where exposure to sunlight allows the development of shrubs (Service 1998). Ecological processes that contribute to the formation of early successional riparian habitat include channel scour and deposition associated with periodic storm events. Therefore, occupied vireo habitat that is adjacent to highly urbanized areas or within major river systems continues to be impacted by flood control and water impoundment projects and may be subject to ongoing and future habitat loss or degradation due to alteration of vegetation structure.

The overall positive population trend for vireo since its listing is primarily due to efforts to reduce threats such as wholesale loss and degradation of riparian habitat and cowbird parasitism. Several large, regional habitat conservation plans in southern California have addressed the effects of urban development on this species. These plans are expected to provide long-term protection of core occurrences of vireos in western Riverside, southern Orange, and San Diego counties. The control of giant reed (*Arundo donax*) has been effective at improving habitat since the original listing of the vireo. Continued control will be needed to achieve local eradications and to address invasions by other exotic plants that continue to degrade existing riparian habitat.

Santa Ana River Woolly-Star

We listed the woolly-star as endangered on September 28, 1987 (52 FR 36265). We have not designated critical habitat for woolly-star because we determined at the time of listing that designation was not prudent. The species occupies the Santa Ana River Watershed within the Counties of San Bernardino and Riverside. The extant range of the woolly-star is from the base of the San Bernardino Mountain Range west along the river and associated alluvial fan, to just beyond the county line in Riverside County. Historically, the species ranged into Orange County but urban development and hydrogeomorphological changes to the Santa Ana River have extirpated the woolly-star from a majority of its historical range.

The woolly-star is susceptible to various threats including habitat destruction, degradation, and fragmentation resulting from urban development, lack of flooding to maintain appropriate habitat conditions for germination and establishment of plants, competition from nonnative grasses (Zembal and Kramer 1984, Burk et al. 1988, Burk et al. 2007), and destruction of individual plants from OHV use (Service 2010). Within the action area, permanent changes to hydrology, infrastructure and other development constitute the greatest threats to the woolly-star. However, despite previous permanent alteration of the hydrologic and sediment transport systems within the remnant fan of the SAR drainage, sufficient storm flow maintains habitat conditions and facilitates germination and recruitment of plants, which is evidenced by the recruitment of a single plant within the action area.

To maintain or improve the status of the woolly-star, occupied areas should be protected and managed to maintain the distribution and increase abundance of the woolly-star. The natural fluvial ecosystem processes necessary to maintain viable, dynamic habitat for woolly-star must also be maintained or restored where feasible within occupied habitat to support woolly-star in the long term. Two woolly-star conservation banks exist on Lytle and Cajon Creeks (Lytle Creek Conservation Bank and Cajon Creek Conservation Bank) near Muscoy, CA, as well as a large conservation area (Woolly-Star Preserve Area) associated with the mainstem of the SAR near Redlands, CA. Please see the recent 5-year review for more specific information on the species description, habitat affinities, life history, status and distribution, threats, and conservation needs of the woolly-star across its current range (Service 2010), which is available at http://ecos.fws.gov/speciesProfile.

ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR § 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation and the impacts of State and private actions that are contemporaneous with the consultation in progress.

The action area is located in the Cities of San Bernardino and Redlands within the historic floodplain of the SAR. The SAR flows over 100 miles from its headwaters in the San Bernardino Mountains to the Pacific Ocean. The SAR has been highly modified to accommodate urban development (flood control), diversion of flows for agricultural or residential use and diversion for storage (ground water recharge). Hydrological modification and habitat loss play significant roles in the distribution of suitable habitat for both vireo and woolly-star throughout the SAR watershed. Habitat for both vireo and woolly-star is maintained through flood disturbance.

Least Bell's Vireo

The Project area is outside of vireo critical habitat. Currently, the only suitable vireo habitat where vireos were observed during 2012 surveys within the action area is located at the SAR crossing location and in the Mission Zanja Channel (GLA 2012). Suitable vireo habitat does not exist in any of the other water crossing locations. Survey records for the SAR indicate that vireos have been consistently observed over the past two decades in the vicinity of the SAR crossing location (Museum 2002, SBCDPW 2002, MBA 2005, SAWA 2006, and GLA 2012). Generally the area supports 2 or more territories in a given year. Four vireo territories (occupied by three single males and one nesting pair) were recorded in the most recent focused surveys (GLA 2012). Of these, three territories were located west of the SAR crossing location, including one nesting pair located adjacent the Project footprint in the Mission Zanja Channel confluence with the SAR.

Santa Ana River Woolly-Star

Seven Oaks Dam is a Corps-built structure maintained and operated by Orange County Flood Control District as a flood control structure and located in the foothills of the San Bernardino Mountains on the SAR upstream of the action area. Seven Oaks Dam is operated in tandem with Prado dam to minimize the risk of flooding San Bernardino, Riverside and Orange Counties. Historically, storm flows maintained woolly-star habitat and dispersed seeds. The natural floodplain of the river is a large alluvial fan, but Seven Oaks Dam operations have reduced the frequency and extent of flooding. It has also reduced sediment transport, and affected the creation and maintenance of woolly-star habitat. Impacts to woolly-star from Seven Oaks Dam were offset through the creation of the Woolly-star Preserve Area (WSPA) located approximately five miles upstream of the action area, where woolly-star is can be found in large numbers.

One woolly-star plant was observed near the overcrossing of the commuter rail bridge within the active floodplain of the SAR (GLA 2012, HDR 2013b). This individual is located within the area of the temporary impact. No other woolly-star plants have been reported in the immediate vicinity of the project footprint. The nearest woolly-star occurrence is located 0.7 miles upstream, so this individual is likely a recent colonizer dispersed downstream by flood water during a storm event.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action, are later in time, and still reasonably certain to

occur.

Both vireo and woolly-star occur in the Project footprint. Focused vireo surveys were conducted by Glenn Lukos Associates biologists on April 16 and 27, May 8 and 21, June 1, 11, and 25, and July 5, 2012. Four vireo territories were identified during the survey period (GLA 2012). One pair was observed exhibiting nesting behavior approximately 150 ft to the south of the Project footprint near the confluence of the SAR and Mission Zanja Channel. This pair was first observed on June 1, 2012 and remained until July 5, 2012. Three individual male vireos were observed at greater distance from the Project area (400 to 500 ft). These were associated with the southern side of the river channel with two territories found west of the Project crossing and one found to the east.

During rare plant surveys, one woolly-star plant was detected within the Project footprint (HDR 2013b). The wooly-star was observed within the temporary impact area of the SAR crossing.

Least Bell's vireo

Direct Effects

Excavation, grading, and disturbance associated with equipment and vehicle access would occur on approximately 5.3 acres along the SAR and Mission Zanja Channel. The Project will result in the destruction of 1.70 acres of riparian habitat used by vireos for breeding, roosting, foraging, and dispersal (HDR 2013b). Since vegetation clearing will be completed outside of the vireo breeding and nesting season when migratory vireos are absent from the area, no eggs, nestlings, or adults will be killed or injured by the proposed Project. Additionally, vegetation removal and other construction activities will be observed by the biological monitor.

Vireos typically return to established breeding territories year after year. We expect one breeding territory within the Project footprint will be partially destroyed as a result of vegetation removal. When vireos return to the Project area to breed, they may be forced to find and compete for habitat elsewhere until suitable riparian vegetation is restored within the riparian corridor. Because suitable habitat will remain downstream and upstream of the Project area, the one affected vireo pair may attempt to use the adjacent habitat. However, these vireos may be subject to the effects of displacement (e.g., delayed breeding, fewer nesting attempts per season or inability to attract a mate, and increased probability of brood parasitism) resulting in an overall reduction in reproductive output (Beck 1996). This is expected to adversely affect displaced birds, and to some extent may interfere with the mating and rearing success of other vireos as habitat areas become more crowded. If displaced birds cannot find suitable habitat in which to forage and shelter, we anticipate they will be more vulnerable to predation and may otherwise die or be injured.

Construction noise may negatively affect the behavior of any vireos located in habitat near the Project area. Noise and vibration are thought to be potentially harmful to a variety of bird

species (RECON 1990, Pike and Hays 1992, Kaseloo 2006). There are four major categories of noise effects on wildlife: (1) auditory physiological; (2) non-auditory physiological; (3) behavioral; and (4) masking (i.e., interference with the reception of auditory signals because of interfering environmental noise) (Dufour 1980). Masking and interference from noise may affect breeding behaviors and reproductive success (Ward and Stehn 1989, RECON 1990, Barrett 1996, Schroeder et al. 2012). If construction and maintenance occur entirely within the non-breeding season (August 16 to March 14), vireos will not be affected by noise, vibration, or human presence from construction activity.

Vireos typically arrive in southern California in mid to late March, with territory establishment and nesting taking place from March through late July (Pike et al. 2011). The species usually departs the breeding grounds by the third week of September. If construction occurs during the breeding season, vireos could be affected by construction-related noise and vibration. Measures to avoid and minimize disturbance from noise and construction impacts include seasonal restrictions on vegetation removal and a biological monitor will be present to ensure that a 500-foot buffer is maintained around any vireos present during construction. After vegetation removal in the construction area, vireos may be present up or down stream from construction activity and in riparian habitat adjacent to the SAR crossing location.

Four vireo territories were identified in 2012 (GLA 2012). One nesting pair of vireo was observed approximately 150 feet to the south of the Project footprint near the confluence of the SAR and Mission Zanja Channel. This pair was first observed on June 1, 2012 and remained until July 5, 2012. Three individual male vireos were observed at greater distance from the Project area (400 to 600 feet). All individual male territories were associated with the southern side of the river channel with two territories found west of the Project crossing location and one found to the east. Due to the distance from the Project footprint we do not expect these individual males to be impacted by Project-related activities.

The FTA and Applicant have incorporated avoidance measures to prevent take of vireos adjacent to construction. To offset the loss of currently occupied vireo habitat in the Mission Zanja Channel, and displacement of as many as one pair of vireo, the Applicant will compensate through an in-lieu fee payment to an appropriate conservation bank for the establishment of 4.50 acres of vireo habitat located within the Santa Ana River Watershed prior to the initiation of vegetation removal activities at the SAR crossing. In addition, temporarily impacted areas within the SAR and Mission Zanja Channel will be restored to pre-grade contours following the completion of construction activities. To minimize soil erosion a Service pre-approved native seed mix, including locally occurring shrub and grass species, will be broadcast over the areas via hand-seeding or hydroseeding, and the areas will be allowed to revegetate naturally. These areas will be monitored and maintained for five years, until vireo is documented using the re-established habitat or until habitat attains 80 percent cover (shrub and tree canopy). If recruitment of woody riparian plant species is not evident within two years of project construction or habitat has not attained 60 percent cover within three years, impacts will be treated as permanent and additional conservation acreage for areas not meeting success criteria

shall be provided through in-lieu fee payment to an appropriate conservation bank in the Santa Ana River Watershed at a ratio of 1:1.

Indirect Effects

The Project is expected to result in an increase in rail traffic from five trips per week to 161 trips per week, with a maximum of two trips per hour (DOT 2014). Although the increase in rail traffic is substantial, cumulative noise is expected to be below 60 Leq in the riparian vegetation near the tracks, since train speed is expected to average 35 miles per hour and the track is elevated above the vireo habitat in the SAR crossing location (DOT 2014). Lights on trains operating at night are not expected to negatively affect vireo due to the elevation of the track above the vireo habitat. Additionally, vireos are frequently detected near human activities that generate intermittent or background noise and lights (e.g. at or near airports and along roadways, including freeways). We therefore do not expect the increase in rail traffic to limit or otherwise disrupt vireo use of the habitat around the SAR crossing.

Effects on Recovery

According to section 2(b), the primary purposes of the Act are to provide a means whereby the ecosystems upon which listed species depend may be conserved, and to provide a program for the recovery of listed species. Under section 2(c), Congress established a policy requiring all Federal agencies to use their authorities in seeking to recover listed species in furtherance of the purposes of the Act. Consistent with these purposes and Congressional policy, sections 3(5), 4(f), 7(a)(1), the implementing regulations to section 7(a)(2) at 50 CFR § 402.02 and related preamble at 51 FR 19926 (June 3, 1986) generally require Federal agencies to further the survival and recovery of listed species in the use of their authorities. According to these mandates, our analysis below assesses (1) whether the proposed action adequately offsets its adverse effects to the environmental baselines for the vireo, and (2) the extent to which the proposed action would cause "significant impairment of recovery efforts" or adversely affect the "species' chances for survival to the point that recovery is not attainable" (51 FR 19926).

Implementation of the proposed Project will result in the temporary loss of a portion of the foraging and nesting habitat of one breeding pair of vireo. Suitable riparian habitat in the action area will be temporarily reduced but the Project is providing for the conservation and management of 4.5 acres of riparian habitat for the benefit if vireo. Over the long term, the action area should support a similar or potentially higher number of vireo pairs as the baseline condition. The population of vireo on the SAR is increasing and we anticipate that the vireo will be maintained in the action area with no appreciable reduction in the numbers, reproduction, or distribution over time. We conclude that the proposed Project does not impair prospects for vireo recovery.

<u>Santa Ana River woolly-star</u>

Direct Effects

One woolly-star plant within the SAR may be impacted by the proposed Project. The Applicant has proposed a conservation measure in an effort to avoid impacting the woolly-star plant in the construction footprint, which includes the use of exclusionary fencing around the plant to minimize the potential for trampling. If excavation, grading, or the installation of a cofferdam and/or construction work pad cannot avoid the plant, it may be killed. No other woolly-star plants are known from the action area.

A common conservation measure used to offset impacts to plants is the collection and planting of seeds or the vegetative propagation by way of stem cutting from the plants proposed for impact. Wooly star is not known to be propagated by stem cuttings and cross pollination is required to produce viable seeds. The individual that is at risk from the Project is isolated from other wooly-star plants and therefore not expected to produce much, if any viable seed. . So, collection and planting of seed from this individual would fail to offset the loss this individual in the distribution of the species in the SAR. The Project proposes to offset the potential impact to woolly-star by collecting seed from wooly star plants up and down stream of the at risk individual distributing the seed in the temporary effect area where the existing plant is located. and the replanting area will be monitored for two years. The area will also be weeded during that two year period.

Adherence to Project limits of construction and implementation of best management practices as described in the conservation measures section of this biological opinion are intended to preclude any direct adverse effects on unidentified plants adjacent to the in-stream portion of the Project footprint.

Indirect Effects

Negative indirect effects to woolly-star resulting from the Project are not anticipated. Changes in hydrology, caused by widening the expanse of the bridge by 70 feet in the SAR crossing location, will alter habitats downstream. With increased capacity under this structure, the velocity and scour caused by flood flows will be reduced. This has benefits to wildlife and potentially to woolly-star downstream of the Project location, although the habitat in this portion of the river is marginal for woolly-star. It is assumed that the net benefit to the species will not be measureable.

Effects on Recovery

The individual wooly-star in the Project footprint represents a recruiting plant. Although there is low probability that this plant will reproduce successfully, removing the potential for reproduction is harmful to the species. Downstream (west) of Orange Street (City of Redlands) to the County of Riverside the species becomes more infrequent in the SAR landscape, and thus each individual is more valuable to the species as a whole. These isolated plants or small groups

of plants represent 'stepping stones' of genetic diversity as well as increase the potential for cross pollination. The SAR crossing location is downstream of Orange Street and as such each plant is very important. Impacts to single plants in this section of the SAR reduce the chance for species recovery by limiting its distribution.

The proposed conservation measures for woolly-star would offset these Project impacts and by replacing the single lost individual with a group of plants that would be reproductive, which would maintain and improve the distribution of the plant in the River. This would contribute to recovery of the species by increasing both genetic diversity and numbers of plants in the action area portion of the river.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We are unaware of any non-Federal actions affecting listed species that are reasonably certain to occur within the action area considered by this biological opinion.

CONCLUSION

After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the proposed Redlands Passenger Rail Project with its associated activities, including pre-construction surveys, is not likely to jeopardize the continued existence of the vireo or woolly-star. We reached these conclusions for the following reasons:

1. The Project proposes to impact 1.70 acres of occupied vireo habitat within the SAR and Mission Zanja Channel. This represents a small portion of the available riparian habitat in the immediate vicinity and we do not expect a permanent reduction in the number of vireo in the action area.

2. Substantial efforts will be undertaken to minimize injury and mortality of both vireo and woolly-star in the SAR crossing location during construction activities which includes the installation of noise attenuation structures during the vireo nesting season and fencing to minimize construction impacts to the single woolly-star plant.

3. Permanent impacts to unoccupied suitable vireo habitat and temporary impacts to occupied vireo habitat will be compensated at a ratio of 3:1 (3.30 acres) and temporary impacts to unoccupied suitable habitat will be compensated at a ratio of 2:1 (1.2 acres), for a total of 4.50 acres of conserved habitat to be purchased through an in-lieu fee payment to an appropriate conservation bank within the Santa Ana River watershed.

4. Seeds from the closest population of woolly-star found upstream of the Project area will be collected and planted in the temporary impact area after grading activities are completed and soils have been re-contoured to pre-Project conditions. Seed harvest shall be limited to no more than 50 percent from any woolly-star plant. Planting of seeds shall be coordinated to occur prior to the first rains of the season, typically during early fall.

5. Woolly-star seedlings will be monitored and maintained for a period of two years to maximize successful establishment.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that actually kills or injures listed wildlife by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is further defined as an intentional or negligent act or omission that creates the likelihood of injury to listed wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and 7(o)(2) of the Act, such incidental take is not considered a prohibited taking under the Act, provided that such taking is in compliance with this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by the Applicant so that they become binding conditions of any permit or grant documents issued to the permittee, as appropriate, for the exemption in section 7(o)(2) to apply. The Applicant has a continuing duty to regulate the activity covered by this incidental take statement. If the Applicant fails to assume and implement the terms and conditions of the incidental take statement or to make them enforceable terms of permit or grant documents, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of the incidental take, the Applicant must report the progress of the action and its impact on the species to the PSFWO as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

Impacts to vireo habitat caused by Project activities will lead to reduced breeding success for vireos in the vicinity of the project. The estimated level of take for vireo is based on the number of vireo pairs in the vicinity of the project and the amount of vireo habitat that will be impacted. If the amount or extent of incidental take is exceeded (i.e., number of vireo pairs affected or amount of habitat impacted), it will trigger reinitiation of consultation.

Take for the Project is exempted as follows:

- Harm to no more than one pair of vireo is expected, as defined in 50 CFR § 17.3, due to the direct loss of no more than 1.70 acres of occupied and suitable vireo habitat (HDR 2014b), that includes a significant portion of the potential use area for this pair. These birds are not expected to die but are anticipated to suffer a reduction in fitness and productivity. The reduction in productivity may extend for a period of up to 5 years or until riparian habitat has regrown within temporary impact areas in the Project area.

EFFECT OF TAKE

In the accompanying biological opinion, we have determined the level of anticipated take noted above would not result in an appreciable reduction in the number, distribution, or reproduction of vireo or woolly-star, and is thus not likely to result in jeopardy to the vireo or woolly-star.

REASONABLE AND PRUDENT MEASURES

The FTA and/or the Applicant shall implement the conservation measures included as part of the proposed action analyzed in this biological opinion to minimize the incidental take of vireo. In addition to these conservation measures, we consider the following reasonable and prudent measures are necessary to minimize the effects of incidental take on vireo:

1. The FTA and/or the Applicant shall monitor and report on compliance with the established take thresholds for vireo associated with the proposed action.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the FTA and/or the Applicant shall comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

To implement reasonable and prudent measure number 1 (monitor and report on compliance with established vireo take thresholds), the FTA and/or the Applicant shall:

1.1 Ensure biological monitors meet the standards for a qualified biologist and have been pre-approved by PSFWO for work on this Project.

1.2 If the biological monitor detects impacts to vireo from Project-related activities in excess of that described in the above incidental take statement, the FTA and/or the Applicant, their agents, or the biological monitor will contact the PSFWO immediately.

1.3 The qualified biologist will submit a brief summary report to the PSFWO identifying the number of vireo that were relocated and any other measures that were taken to minimize

impacts to vireo. The report will be submitted to the PSFWO no more than 60 days following capture and relocation activities. The purpose of this report is to ensure impacts to vireo from the Project do not exceed take thresholds.

DISPOSITION OF SICK, INJURED, OR DEAD SPECIMENS

The Applicant shall notify the PSFWO (see address and phone number below) within 3 working days if any endangered or threatened species is found dead or injured as a direct or indirect result of Project implementation. Notification must include the date, time, and location of the injured animal or carcass, and any other pertinent information. In addition, mark dead animals appropriately, photograph, and leave the carcass on site; transport injured animals to a qualified veterinarian; and contact the PSFWO regarding the final disposition of any treated animals that survive.

REINITIATION NOTICE

This concludes formal consultation regarding the Project as described in materials submitted to us. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In all instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

For further information about this biological opinion, please contact Kai Palenscar of the PSFWO, 777 E. Tahquitz Canyon Way, Suite 208, Palm Springs, California 92262 at 760-322-2070, extension 208.

Sincerely,

G. Mendel Stewart
Field Supervisor

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February 6, 2015

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Subject: Proposed Mitigation Plan for Redlands Passenger Rail Project – USACE Permit SPL-2013-00117 and CDFW SSA 1600-2014-0227-R6

Ms. Pankratz and Ms. Freeburn:

The San Bernardino Associated Governments (SANBAG) is proposing the Redlands Passenger Rail Project (RPRP or project) to provide local transit and express passenger rail service between the Cities of San Bernardino and Redlands in southwestern San Bernardino County, California. Five station stops are proposed along a nine-mile section of railroad owned by SANBAG; commonly referred to as the "Redlands Spur" with two stations located at E Street and Waterman Avenue in San Bernardino and three in Redlands at New York Street, Downtown Redlands, and the University of Redlands.. The project proposes replacement of rail infrastructure along the full length of the corridor including track, siding, and subgrade improvements, new rail stations, replacement of existing bridge structures, and rehabilitation of existing at-grade roadway crossings. Consistent with SANBAG's Locally Preferred Alternative (LPA), the project will operate a diesel multiple unit (DMU) vehicle with layover operations integrated into existing train layover facilities.

On-Site Jurisdictional Areas (Baseline)

The project permit area contains five (5) jurisdictional drainages identified as Warm Creek (Historic), Twin Creek, Santa Ana River (SAR), the Mission Zanja Flood Control Channel (MZC), and Mill Creek Zanja as depicted in Figure 1. These drainages are jurisdictional according to criteria applied by U. S. Army Corps of Engineers (USACE) and the California Department of Fish and Wildlife (CDFW), Inland Deserts Region. Federal and state jurisdiction areas contained within the physical footprint for the project totals up to 6.009 acres of waters of the United States (U.S.), including 0.05 acre of federal wetlands within Twin Creek, and 14.697 acres of waters of the State.

Jurisdictional Impacts

Implementation of the project would result in a total of 6.009 acres of impacts to waters of the U.S. and 14.697 acres of CDFW jurisdictional areas. Tables 1 and 2 provide a breakdown of project-related impacts to USACE and CDFW jurisdictional areas by permit area. This includes up to

13,860 linear feet of impacts to five jurisdictional drainages, which consists mainly of disturbed habitat, unvegetated channel, and concrete-lined channel. As provided in Table 1, the vast majority of this distance occurs along the MZC, which parallels and is contained within the southern portion of SANBAG's right-of-way for a distance of approximately (2.55 miles). Elements of Southern Cottonwood Willow Riparian Forest (SCWRF), Riversidean alluvial fan sage scrub (RAFSS), and Southern Willow Scrub (SWS) are contained within the SAR and western-most portion of the MZC. These areas would be impacted from temporary construction activities and though the placement of approximately 644 cubic yards of soil and concrete through the placement of new bridge piers and drainage outfalls. Bank improvements for track stabilization and safety are also proposed using an articulated concrete block (ACB), which would be placed along up to 13,650 linear feet of the northern bank of the MZC. These improvements would require the placement of up to 4,987 cubic yards of fill.

As shown in Table 3, the total area within the five jurisdictional drainages permanently impacted by the Project-related fill is approximately 0.30 acre of USACE jurisdiction and 1.65 acres of CDFW jurisdiction. These permanent effects would be partially compensated through up to 0.1 acre of creation of waters of the U. S. and State through bridge widening at the SAR (estimated at 100 feet). The remaining effects to the five jurisdictional drainages would consist of temporary impacts during construction. All jurisdictional areas temporarily disturbed during channel-related construction activities and outside SANBAG's right-of-way would be naturally revegetate using native seed mixes.

In addition to impacts to USACE and CDFW jurisdictional areas, up to 1.7 acres of marginally suitable least Bell's vireo habitat (LBV) would be directly impacted by project construction. The 1.70 acres of marginally suitable LBV habitat partially overlaps with the 0.30 acres of USACE jurisdiction and 1.70 acres of CDFW jurisdiction within the permit area. For this reason and based on the mitigation ratios applied in the final Biological Opinion (FWS-SB-13B0313-14F0146), as shown in Table 3 the proposed on-site mitigation for up to 13.157 acres and off-site mitigation for up to 4.285 acres will satisfy the habitat compensation requirements for the project.

This mitigation plan also addresses direct impacts to the Santa Ana River woolly star (SARWS), which is located in an area mapped at non-vegetated channel. Mitigation for SARWS will occur through a combination of on-site restoration following protocols outlined in the final BO combined with the off-site mitigation of 0.01 acre. These combined measures would address the temporal effects of construction until SARWS can be reseeded on-site during site revegetation.

Table 1. Jurisdictional Impacts by Permit Area (USACE)

Habitat[1]	Permit Area 1		Permit Area 2		Permit Area 3		Permit Area 4		Permit Area 6	
	Temp.	*Perm.*	*Temp.*	*Perm.*	*Temp.*	*Perm.*	*Temp.*	*Perm.*	*Temp.*	*Perm.*
Disturbed Habitat	--	--	--	--	0.002 ac	--	--	--	--	--
Disturbed Wetland	--	--	0.020 ac	--	--	--	--	--	--	--
Non-vegetated channel	0.046 ac	--	0.483 ac	--	0.782 ac	0.055 ac	4.104 ac	0.173 ac	0.101 ac	0.022 ac
SWS	--	--	0.027 ac	--	0.051 ac	--	--	--	--	--
SCWRF	--	--	--	--	--	0.002 ac	0.094 ac	0.046 ac	--	--
Total	0.046 ac	--	0.529 ac	--	0.833 ac	0.058 ac	4.198 ac	0.219 ac	0.101 ac	0.022 ac
Length (Linear Feet)	112 feet		253 feet		240 feet		13,860 feet[2]		90 feet[3]	

1. Habitats include those located at Warm Creek (Permit Area 1), Twin Creek (Permit Area 2), Santa Ana River (Permit Area 3), Mission Zanja Channel (Permit Area 4), and Mill Creek Zanja (Permit Area 6). Permit Area 5 does not include any USACE jurisdictional areas that would be subject the discharge of fill as a result of the project.
2. Breakdown of linear footage: 400 feet for drainage outfalls and 13,460 feet for bank improvements.
3. Breakdown of linear footage: 20 feet for drainage outfalls and 70 feet for bridge improvements.

Table 2. Jurisdictional Impacts by Permit Area (CDFW)

Habitat[1]	Permit Area 1		Permit Area 2		Permit Area 3		Permit Area 4		Permit Area 6	
	Temp.	*Perm.*	*Temp.*	*Perm.*	*Temp.*	*Perm.*	*Temp.[2]*	*Perm.[3]*	*Temp.*	*Perm.*
Disturbed Habitat	--	--	--	--	0.047 ac	--	0.044 ac	0.203 ac	--	--
Disturbed Wetland	--	--	0.020 ac	--	--	--	--	--	--	--
Eucalyptus Woodland	--	--	--	--	0.031 ac	--	--	--	--	--
Non-vegetated channel	0.046 ac	--	0.694 ac	--	0.824 ac	0.055 ac	10.418 ac	0.336 ac	0.192 ac	0.124 ac
RAFSS	--	--	--	--	0.046 ac	--	--	--	--	--
SWS	--	--	0.027 ac	--	0.089 ac	--	--	--	--	--
SCWRF	--	--	--	--	0.265 ac	0.021 ac	0.304 ac	0.910 ac	--	--
Total	0.046 ac	--	0.740 ac	--	1.256 ac	0.077 ac	10.723 ac	1.246 ac	0.192 ac	0.124 ac

1. Habitats include those located at Warm Creek (Permit Area 1), Twin Creek (Permit Area 2), Santa Ana River (Permit Area 3), Mission Zanja Channel (Permit Area 4), and Mill Creek Zanja (Permit Area 6). Permit Area 5 does not include any CDFW jurisdictional areas that would be subject the discharge of fill as a result of the project.

Table 3. Jurisdictional Impact Summary and Proposed Mitigation

Habitat[1]	USACE		CDFW		USFWS		Required Mitigation		Proposed Mitigation		Net Impacts
	Temp.	*Perm.*	*Temp.*	*Perm.*	*Temp.*	*Perm.*	*Temp.[2]*	*Perm.[3]*	*On-site*	*Off-site*	
Disturbed Habitat	0.002 ac	--	0.091 ac	0.203 ac	--	--	0.091 ac[4]	0.203 ac[4,5]	--	--	None
Disturbed Wetland	0.020 ac	--	0.020 ac	--	--	--	0.020 ac	--	0.020 ac	--	
Eucalyptus Woodland	--	--	0.031 ac	--	--	--	0.031 ac[4]	--	--	--	
Non-vegetated channel	5.515 ac	0.252 ac	12.175 ac	0.516 ac	--	--	12.175 ac	0.516 ac[5]	12.397 ac[6]	0.619 ac	
RAFSS	--	--	0.046 ac	--	--	--	0.093 ac[7]	--	0.046 ac	0.046 ac	
SWS	0.077 ac	--	0.569 ac	0.931 ac	0.620 ac[7]	0.960 ac[8]	0.240 ac	--	0.120 ac	0.120 ac	
SCWRF	0.094ac	0.048 ac	0.115 ac	--	0.120 ac[7]	--	1.240 ac	2.880 ac	0.620 ac	3.5 ac	
Total	5.709 ac	0.300 ac	13.047 ac	1.650 ac	0.74 ac	0.96 ac	13.889 ac	4.206 ac	13.157 ac	4.285 ac	

1. Habitats include those located at Warm Creek, Twin Creek, Santa Ana River, Mission Zanja Channel, and Mill Creek Zanja.
2. Temporary impacts to waters of the U. S. and State are mitigated at a ratio of 1:1 unless otherwise noted.
3. Permanent impacts to Waters of the U. S. and State are mitigated at a ratio of 2:1 unless otherwise noted.
4. Disturbed habitat and eucalyptus woodlands are replaced as non-vegetated channel.
5. Permanent impacts to disturbed habitat and non-vegetated channel are mitigated at a ratio of 1:1.
6. Channel widening at Bridge 3.4 would create up to 0.10 acre of non-vegetated channel, thereby resulting in a net increase.
7. Temporary impacts to RAFSS are mitigated at a ratio of 2:1.
8. In accordance with FWS-SB-13B0313-14F0146, temporary impacts are mitigated at a ratio of 2:1 to account for temporal changes in habitat conditions following construction and prior to natural revegetation. 0.14 acre of LBV occupied habitat is mitigated at 3:1.
9. In accordance with FWS-SB-13B0313-14F0146, permanent impacts are mitigated at a ratio of 3:1.

Proposed On-Site and In-Lieu Fee Mitigation

As part of the RPRP, SANBAG will implement this mitigation plan to compensate for effects to waters of the U. S., waters of the State, including RAFSS, and direct impacts to LBV and SARWS. Table 3 outlines the Project-related impacts and proposed mitigation for these impacts. Consistent with current USFWS's mitigation policy (501 FW 2) and USACE's Mitigation Rule, SANBAG proposes to purchase in-lieu fee credits for off-site mitigation to compensate for temporal and permanent impacts to waters of the U. S., waters of the State, and LBV habitat. The basis for selecting In-Lieu Fee (ILF) credits to support off-site mitigation is centered on two primary issues: (1) SANBAG's need to maintain its ROW free of vegetation and related obstructions; and (2) the fact that adjacent lands impacted by construction are owned by the San Bernardino County Flood Control District (SBCFCD) and subject to existing and planned maintenance.

Mitigation – Permanent Impacts

SANBAG proposes ILF mitigation through the purchase of mitigation credits from the Corona Riverside Resource Conservation District (RCD) ILF Program. SANBAG proposes payment into the RCD's Rehabilitation Category to compensate for up to 4.20 acres of combined permanent impacts to LBV habitat and CDFW jurisdictional areas. This compensation acreage would include an envelop that encompass USACE's jurisdiction. This mitigation proposal would result in a much higher quality of habitat being preserved and restored under the Riverside-Corona RCD ILF Program when compared to the degraded habitat conditions within the railroad ROW. ILF credits would be purchased prior to the start of construction, which is scheduled for 2016. Evidence of payment would be provided to USACE, CDFW, the Regional Water Quality Control Board (RWQCB), Santa Ana Region, and USFWS.

To compensate for the temporal loss of SARWS and RAFSS habitat during construction, SANBAG proposes the purchasing of up to 0.085 acre of credits through the Lytle Creek Conservation Bank. ILF credits would be purchased prior to the start of construction, which is scheduled for 2016. Evidence of payment would be provided to CDFW.

Mitigation – Temporary Impacts

All temporarily disturbed areas will be re-contoured to pre-project conditions. Temporarily impacted areas outside of the active floodplain will be hydroseeded with native grasses and shrubs for long-term erosion control. Riparian areas within the active floodplain and adjacent terraces will revegetate through natural processes. Natural recruitment is anticipated to occur rapidly due to the large amount of intact native riparian habitat that will remain as a seed source. Additionally, the riparian habitat being impacted is adapted to frequent disturbance. The individual species making up the community tend to have large quantities of seeds and very rapid growth that promote rapid re-establishment. Container planting and seeding has not been proposed due to potential conflicts with the SBCFCD Flood Control Maintenance requirements and high risk of plant material being washed out during subsequent storm events.

Temporary impacts to SWS, RAFSS, and SCWRF would be mitigated at a ratio of 2:1 with the on-site disturbance area being restored following construction and the purchasing of off-site credits to

compensate for the temporal loss. Direct impacts to the SARWS would be compensated through a combination of on-site restoration following protocols outlined in the final BO combined with the purchasing of ILF credits as described above.

Biotechnical bank stabilization methods such as straw wattles and biodegradable erosion control mats may also be implemented as needed and where appropriate. To avoid possible entrapment of small animals, including listed species, plastic monofilament netting will not be used. The temporary impact areas will be monitored annually for five years, until LBV is documented using the re-established habitat or until habitat attains 80-percent cover including both shrub and overstory stratum. If recruitment of SCWRF and SWS species is not evident within two years of project construction or habitat has not attained 60-percent cover within three years, impacts will be treated as permanent and additional mitigation for areas not meeting success criteria shall be provided.
No long-term management of the restored areas outside of SANBAG's ROW is proposed as these areas would be subject to long-term maintenance activities routinely implemented by SBCFCD.

Financial Assurances

Our correspondence with the Riverside-Corona RCD and the Lytle Creek Conservation Bank indicates that sufficient habitat credits are available within their ILF Programs to provide mitigation credits for this project. The estimated cost for participation in Riverside-Corona RCD's ILF Program Ongoing Restoration Category is up to $770,000.00. The estimated cost for participation in Lytle Creek Conservation Bank is up to $22,950.00. SANBAG will provide the ILF payment to Riverside-Corona RCD and Lytle Creek Conservation Bank prior to the start of construction, which is expected to start in 2016. SANBAG agrees to adherence with the Riverside-Corona RCD and Lytle Creek Conservation Bank Mitigation Guidelines and will provide evidence of the ILF payment to USACE, USFWS, RWQCB, and CDFW prior to the start of construction.

Please contact me or Justin Fornelli (909.884.8276) with any questions.

Sincerely,

_____

Mitch Alderman, PE
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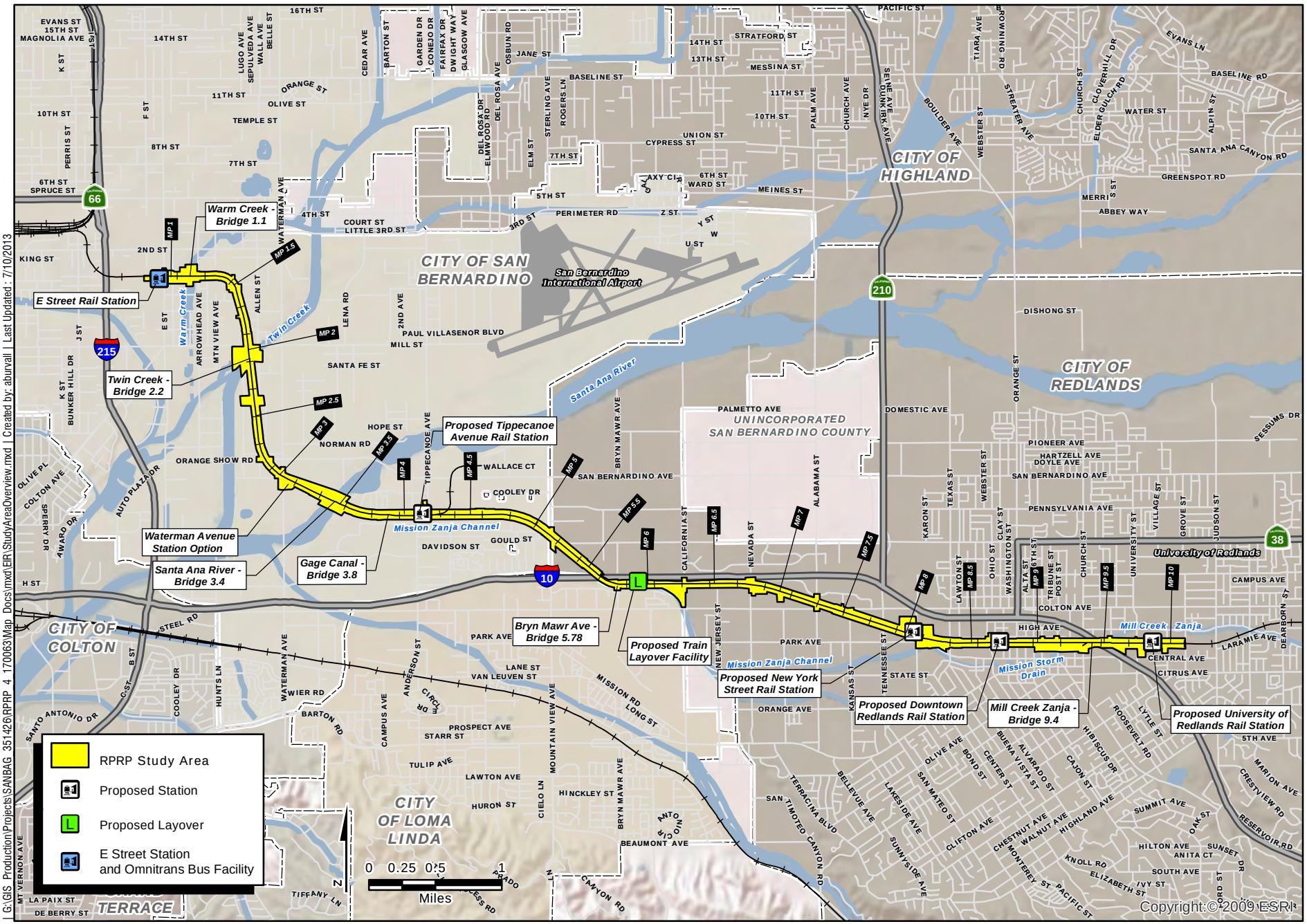
San Bernardino Associated Governments
1170 W. 3rd Street, 2nd Fl,
San Bernardino, CA 92410



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RPRP Overview

Figure 1

FTA/SANBAG | Redlands Passenger Rail Project | MMP

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer To:
FWS-SB-13B0313-14F0168

FEB 09 2015

Mr. Leslie T. Rogers
Regional Administrator
Federal Transit Administration
201 Mission Street, Suite 1650
San Francisco, California 94105-1839

Attention: Ms. Dominique Paukowits, FTA Community Planner

Subject: Formal Section 7 Consultation for the proposed Redlands Passenger Rail Project, San Bernardino County, California

Dear Mr. Rogers:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the Redlands Passenger Rail Project (Project) and its effects on the federally endangered least Bell's vireo (*Vireo bellii pusillus*, vireo) and the federally endangered Santa Ana River woolly-star (*Eriastrum densifolium* subsp. *sanctorum*, woolly-star) in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*). San Bernardino County Associated Governments (SANBAG) is the non-Federal applicant (Applicant).

This biological opinion does not address critical habitat for vireo, nor does it address three federally listed species with ranges that include the larger Project vicinity: federally endangered San Bernardino kangaroo rat *(Dipodomys merriami parvus*), the federally threatened Santa Ana sucker (*Catostomus santaanae*), or the federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*; flycatcher). In the letter requesting initiation, your agency - the Federal Transportation Administration (FTA), indicated that the Project is not likely to affect these species. We do not expect the San Bernardino kangaroo rat, Santa Ana sucker, or the flycatcher to be present in the Project area, and Project impacts to their respective designated critical habitats will be temporary and not significant. We therefore do not consider them further in this biological opinion.

This biological opinion is based on the following information: (1) *Biological Technical Report for Redlands Passenger Rail Project* (HDR 2013a); (2) *Biological Assessment for Redlands Passenger Rail Project* (HDR 2013b); (3) *San Bernardino Kangaroo Rat (Dipodomys merriami parvus) Habitat Assessment & Focused Survey Report* (TDA 2012); (4) *Results of a Focused Rare Plant Survey* (HDR 2013b); (5) *Redlands Passenger Rail Project Draft*

Environmental Impact Statement / Environmental Impact Report (DOT 2014); and (6) other information in our files. In addition, information was provided during informal consultation at a site visit and meeting, and by written correspondence, electronic mail, telephone conversations, and other sources of information compiled during the course of discussions. A complete record of this consultation is on file at the Carlsbad Fish and Wildlife Office (CFWO).

CONSULTATION HISTORY

On May 1, 2013, the Palm Springs Fish and Wildlife Office (PFWO) received your letter requesting initiation of formal consultation under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*), to address impacts from the proposed federal action. On May 28, 2013, we received the draft biological technical report for the Project. During a site visit on July 15, 2013, attended by the Service, HDR, Inc., San Bernardino Associated Governments (SANBAG), and California Department of Fish and Wildlife (CDFW), biological concerns were identified. On August 9, 2013, the Service responded to your letter, requesting additional information to complete the Section 7 initiation package for the Project. The biological assessment (BA), dated November 2013 was received by the Service on January 7, 2014.

We received a letter on December 12, 2013, which re-requested initiation of formal Section 7 consultation. Sufficient information to initiate consultation was contained in the documents provided or is otherwise accessible for our consideration and reference, therefore consultation was initiated on January 7, 2014. Due to workload and staffing constraints within our office we requested and received a 60-day extension on the due date for the biological opinion by the Federal Transit Administration (FTA), and subsequently two separate 30-day extensions.

The Project requires a permit from the United States Army Corps of Engineers for impacts to waters of the United States. The FTA is the lead for the Section 7 consultation process with the Service.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Redlands Passenger Rail Project proposes commuter rail improvements along the approximately nine-mile Redlands Corridor from the City of San Bernardino east to the City of Redlands in southwestern corner of San Bernardino County, California. These improvements will facilitate an increase in rail traffic from 5 trips per week to 25 trips per day (22 trips during daylight hours and 3 during evening hours). The Project right-of-way is owned by SANBAG and includes the existing rail and adjacent areas from E Street in San Bernardino to just east of University Avenue near the University of Redlands in the city of Redlands. The Project will facilitate passenger service along this route with five station stops. Four new station stops will be constructed in conjunction with the Project. From the west to the east along the Project route, station stops will be at Tippecanoe Avenue or Waterman Avenue within the City of San

Bernardino, and New York Street, Orange Street, and University Street within the City of Redlands. The fifth station stop will be constructed at E Street and is associated with a different project; the Downtown San Bernardino Passenger Rail Project. A layover facility just south of Interstate 10 freeway and west of California Street, which would contain up to seven tracks, is also proposed. Light rail maintenance activities and operational activities including the storage of trains will be carried out at this facility. Project activities involve the demolition and replacement of the existing track, the track ballast, and the sub-grade along the nine-mile corridor. The new track will be generally reconstructed to 50 feet in width and all construction activities will be confined to this area. Exceptions will be at bridge crossings and where development constrains the track width. Track improvements are proposed to include the installation of new continuously welded rail on concrete ties and new ballast and sub-ballast sections throughout the rail corridor. Additional proposed activities include the replacement or retrofitting of structural crossings and bridges, installation of redesigned roadway grade crossings and signaling, addition of rail platforms, utility replacement and relocation, drainage facility improvements, and railroad right-of-way maintenance. Construction is proposed to start in 2015 and take up to 36 months to complete and would proceed from the west to the east.

The Project will require replacement or retrofitting of crossings at Warm Creek, Twin Creek, the confluence of Santa Ana River (SAR) and Mission Zanja Flood Control Channel, and Mill Creek Zanja for the purpose of facilitating increased loading requirements of passenger trains. Crossings vary from 40 to 100 feet in width and are expected to impact 3.47 acres of riparian habitat including both southern willow scrub and southern cottonwood-willow riparian forest. Vireo and woolly-star have been observed at crossing over the confluence of the SAR and the Mission Zanja Flood Control Channel. The majority of the Project-related riparian impacts will occur at this crossing.

Santa Ana River Crossing

The existing bridge at the SAR will be widened by 20 feet and lengthened by approximately 70 feet. The bridge abutment cone will be graded, blended, and re-contoured to match the riverbank slopes to the greatest extent practicable. Armoring is anticipated at the abutments and will use either riprap or articulated concrete block matting. The existing bridge piers will be removed and replaced with longer piers to accommodate the increased bridge width. Existing bridge piers will be removed after installation of the new bridge foundation.

Construction activities within the SAR during periods when the river is flowing may require the installation of a cofferdam and/or construction work pad to isolate the work area within the wetted portions of the river. It may be necessary to conduct such work during the nesting season.

The increased bridge width and pier length will accommodate the installation of a second set of tracks at a future date. The installation of the second track is not anticipated in the near term and impacts associated with a second rail are not analyzed in this biological opinion.

Conservation Measures

The measures identified below have been incorporated into the proposed Project for the purpose of offsetting or avoiding and/or minimizing impacts to the vireo in the action area.

1. Access roads and construction areas that are off of existing paved surfaces will be clearly flagged prior to construction activities.

2. Within the construction footprint, areas to remain undisturbed will be clearly flagged or otherwise delineated prior to any construction activities. A biological monitor will be on site to monitor all activities that result in the removal of sediment or vegetation and ensure that these activities do not encroach into the delineated avoidance areas. The biological monitor will have the authority to halt Project activities occurring outside of designated construction areas.

3. All permanent impacts to suitable vireo habitat (0.96 acre) and temporary impacts to occupied vireo habitat within Mission Zanja Channel (0.14 acre) will be replaced at a ratio of 3:1 (2.88 + 0.42 = 3.30 acres), of which 0.14 acre will be restored on-site. Additional temporary impacts to suitable vireo habitat within Mission Zanja Channel (0.60 acre) will be replaced at a ratio of 2:1 (1.20 acres), of which 0.60 acre will be restored on-site. In total 4.50 acres of vireo habitat will be replaced, including 0.74 acre to be restored on-site associated with temporary impact locations and 3.76 acres will be compensated off-site through an in-lieu fee payment to an appropriate conservation bank located within the Santa Ana River Watershed. SANBAG will provide the Service with proof of purchase of credits for 3.76 acres of vireo habitat in the SAR above Prado dam, prior to ground breaking or vegetation removal activities.

4. All temporarily impacted riparian habitat areas will be restored to pre-grade contours following the completion of construction activities. To minimize soil erosion a Service pre-approved native seed mix, including locally occurring shrub species, will be broadcast over the areas via hand-seeding or hydroseeding and allowed to revegetate naturally. These areas will be monitored and maintained for 5 years, until vireo is documented using the re-established habitat or until habitat attains 80 percent cover (shrub and tree canopy). An annual report describing conditions in the monitored and maintained area will be provided to the Service each year by October 1. If recruitment of woody riparian plant species is not evident within 2 years of Project construction or habitat has not attained 60 percent cover within 3 years, impacts will be treated as permanent and additional conservation acreage for areas not meeting success criteria shall be provided through in-lieu fee payment to an appropriate conservation bank in the Santa Ana River Watershed at a ratio of 1:1.

5. Vegetation removal will be conducted between September 16 and March 14 (outside of the vireo nesting season).

6. When construction activities occur on the southern bank of the of the SAR in the period between March 15 and August 15 (vireo nesting season), the FTA or SANBAG will require a qualified biologist to survey any potential vireo habitat within 500 feet of the active work area weekly during the breeding season. In the event that vireo nesting activity is detected within 500 feet of the work area, if feasible, a 500 foot buffer will be established between construction activities and the approximate edge of the vireo territory, to avoid affects to nesting vireo. If this is not possible, noise attenuation structures will be placed at the edge of the work area to reduce construction noise to 60 decibels or less at the approximate edge of the vireo territory. These structures will remain in place until all nestlings have fledged or construction activities have moved 500 feet beyond that area of vireo activity.

7. Prior to construction activities, a qualified biologist will conduct pre-construction training for all construction crew members. The training will identify all required vireo and woolly-star avoidance and minimization measures and include information on sensitive species and vegetation communities present within and adjacent to the proposed Project site and staging areas. Southern cottonwood willow riparian forest, southern willow scrub habitat, vireo and woolly star will all be addressed.

8. A qualified biologist (or environmental monitor) will monitor construction activities to document compliance with conservation measures. A weekly summary report will be provided to SANBAG.

9. SANBAG will submit a final report to the PSFWO within 30 days of completing the Project. This report will include a summary of all Project activities conducted within the action area including, timing and duration of activities, methods and equipment used to conduct activities, quantity and type of sediment and/or vegetation removed, total area of impacts, a map identifying locations of activities, a list of avoidance and minimization measures implemented during activities, and before and after photographs of temporary impact areas.

The measures identified below have been incorporated into the proposed Project for the purpose of avoiding and/or minimizing vireo effects downstream of the Project and/or within the surrounding watershed.

10. Equipment will be in proper working condition and inspected for leaks and drips on a daily basis prior to commencement of any in-channel work during construction activities.

11. A spill prevention and remediation plan will be developed and implemented during construction and operation activities. Workers will be instructed as to the requirements listed in the plan. Construction supervisors and workers and maintenance personnel will be instructed to (1) be alert for indications of equipment-related contamination such as stains and odors, and (2) respond immediately with appropriate actions as detailed in the

spill prevention and remediation plan if indications of equipment-related contamination are noted.

12. Sediment barriers (e.g., sandbags, silt fence, temporary containment dam) will be placed downstream of each major construction operation to prevent downstream sedimentation.

13. Areas of exposed soil, dirt stockpiles, dirt berms, and temporary dirt roads will be stabilized with controlled amounts of sprinkled water during construction.

14. Construction waste will be contained and disposed of away from the Project construction sites.

15. Vehicles and equipment storage shall occur away from waterways in pre-determined staging areas.

16. Project-related vehicle traffic shall be restricted to established roads and areas used for construction, storage, staging, or parking.

17. Refueling and maintenance of equipment and vehicles will be prohibited within 50 feet of waterways during construction activities.

18. Spill kits containing absorbent materials will be kept at the Project site during construction activities.

19. Fuels and other hazardous materials will be stored in designated areas away from drainage areas.

These conservation measures have been included in the Project description for the purpose of avoiding and minimizing Project impacts to woolly-star.

20. Prior to construction activities, a qualified biologist will conduct pre-construction surveys within appropriate habitat in the SAR and Mission Zanja Channel for federally listed plant species occurring in the Project area. If additional woolly-star plants or other listed plant species are located within the action area then the Applicant will contact the Service immediately.

21. Prior to construction activities, the Applicant will erect exclusionary construction fencing creating a five-foot buffer around the perimeter of the woolly-star plant. Exclusionary fencing will be maintained throughout the construction period unless it is necessary to remove the plant for the creation of a cofferdam and/or construction work pad. Exclusionary fencing will be removed at the conclusion of construction work in that area as approved by the biological monitor.

22. Seeds from the closest known occurrences of woolly-star plants found both upstream and downstream of the Project area in the SAR shall be collected in the fall prior to construction of the SAR crossing. If construction activities require the loss of the single woolly-star at the SAR crossing, the collected seeds will be broadcast in the temporary impact areas, near the impacted woolly-star plant, after construction activities are complete and soils have been restored to pre-Project contours.

    a. Seed collection and broadcast methodologies will be proposed by a qualified seed collector approved by the Service prior to seed collection in a Santa Ana Woolly-Star Management Plan.

    b. Seed harvest shall be from a minimum of 3 plants per collection location, limited to no more than 50 percent of the available seeds from any 1 woolly-star plant.

    c. Seeds shall be held at the appropriate temperature and humidity for the shortest length of time necessary prior to planting.

    d. Planting of seeds shall be coordinated to occur prior to the first rains of the season, typically during early fall.

    e. If the woolly-star plant known in the Project area is avoided, collected seeds will be hand broadcast near the parental plants where they were collected.

23. Woolly-star seedlings will be monitored and maintained for a period of 2 years to maximize successful establishment in all planted areas. At minimum, one flowering individual shall be required to satisfy this measure. If no plants are established during this 2 year period, replanting in the impact area, off-site restoration, or purchase of mitigation credits will be required. This conservation measure is exempt in the event no impact to a woolly-star plant occurs. The status of the woolly-star individuals in monitored and maintained area will be included in the annual report identified in Conservation Measure 4.

Action Area

According to 50 CFR § 402.2, pursuant to section 7 of the Act, the “action area” includes all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. Areas subject to direct effects include all those areas within the Project footprint including construction vehicle access routes, staging areas, and maintenance areas. Indirect effects include degradation of adjacent occupied vireo habitat from construction activities and edge effects. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based on the action area as determined by our agency. We have defined the action area to include the approximately 9 mile Redlands Corridor from the City of San Bernardino east to the City of Redlands, with a 500-foot buffer to account for those

areas where we anticipate Project-related effects such as increased noise, light, dust levels and human activity during construction of the Project. To encompass indirect effects from Project impacts to water crossings, the action area was extended downstream to the next confluence for each crossing.

STATUS OF THE SPECIES

Least Bell's vireo

The following section summarizes information about the federally endangered Least Bell's vireo relative to its legal status and biology. For detailed information on the vireo's biology, ecology, range-wide status, threats, and conservation needs, please refer to the draft recovery plan (Service 1998) and 5-year review (Service 2006). Additional information is also available in the final rule designating critical habitat for vireo (59 FR 4845). These documents are available on the internet at: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B067

The vireo was listed as endangered on May 2, 1986 (51 FR 16474), in response to a dramatic decline in population and widespread loss of riparian habitat. Critical habitat for vireo was designated on February 3, 1994. A draft recovery plan was published in March 1998 (Service 1998), though a final plan has not been issued. We completed a 5-year review for vireo in September 2006 in which we indicated that, due to new information on the species and an improved understanding of ongoing recovery actions to reduce threats, the recovery goals and strategies should be modified and refined. In addition, we recommended that the vireo be down-listed from endangered status to threatened status because of a ten-fold increase in population size since its listing in 1986, expansion of locations with breeding vireo throughout southern California, and conservation and management of suitable breeding habitat throughout its range (Service 2006).

The vireo historically occupied willow riparian habitats from Tehama County in northern California, southward to northwestern Baja California, Mexico, and as far east as Owens Valley, Death Valley, and the Mojave River (Grinnell and Miller 1944, Service 1998). Greater than 99 percent of the remaining vireos occur in southern California, south of the Tehachapi Mountains (Service 2006). Thus, despite a significant increase in overall population numbers, and a slight shift northward in the species overall distribution, the population remains restricted to the southern portion of its historic range (Service 2006).

Vireos use a number of riparian habitat types, including cottonwood-willow woodlands/forests, oak woodlands, and mule fat scrub. However, vegetation structure is an important determinant of vireo site use. The vireo is an obligate riparian species during the breeding season, and prefers diverse early successional riparian habitat. Early successional riparian vegetation typically supports the dense shrub cover required for nesting and also a structurally diverse canopy for foraging (Service 1998). Occupied breeding habitat generally includes dense cover within 3 to 6 feet of the ground for nesting and a dense, stratified canopy for foraging. Plant

species composition does not appear as important a determinant in nesting site selection as habitat structure. As riparian vegetation matures, the tall stands tend to shade out the shrub layer, making the sites less suitable for vireo nesting. In addition, vireo nests tend to occur in openings and along the riparian edge, where exposure to sunlight allows the development of shrubs (Service 1998). Ecological processes that contribute to the formation of early successional riparian habitat include channel scour and deposition associated with periodic storm events. Therefore, occupied vireo habitat that is adjacent to highly urbanized areas or within major river systems continues to be impacted by flood control and water impoundment projects and may be subject to ongoing and future habitat loss or degradation due to alteration of vegetation structure.

The overall positive population trend for vireo since its listing is primarily due to efforts to reduce threats such as wholesale loss and degradation of riparian habitat and cowbird parasitism. Several large, regional habitat conservation plans in southern California have addressed the effects of urban development on this species. These plans are expected to provide long-term protection of core occurrences of vireos in western Riverside, southern Orange, and San Diego counties. The control of giant reed (*Arundo donax*) has been effective at improving habitat since the original listing of the vireo. Continued control will be needed to achieve local eradications and to address invasions by other exotic plants that continue to degrade existing riparian habitat.

Santa Ana River Woolly-Star

We listed the woolly-star as endangered on September 28, 1987 (52 FR 36265). We have not designated critical habitat for woolly-star because we determined at the time of listing that designation was not prudent. The species occupies the Santa Ana River Watershed within the Counties of San Bernardino and Riverside. The extant range of the woolly-star is from the base of the San Bernardino Mountain Range west along the river and associated alluvial fan, to just beyond the county line in Riverside County. Historically, the species ranged into Orange County but urban development and hydrogeomorphological changes to the Santa Ana River have extirpated the woolly-star from a majority of its historical range.

The woolly-star is susceptible to various threats including habitat destruction, degradation, and fragmentation resulting from urban development, lack of flooding to maintain appropriate habitat conditions for germination and establishment of plants, competition from nonnative grasses (Zembal and Kramer 1984, Burk *et al.* 1988, Burk *et al.* 2007), and destruction of individual plants from OHV use (Service 2010). Within the action area, permanent changes to hydrology, infrastructure and other development constitute the greatest threats to the woolly-star. However, despite previous permanent alteration of the hydrologic and sediment transport systems within the remnant fan of the SAR drainage, sufficient storm flow maintains habitat conditions and facilitates germination and recruitment of plants, which is evidenced by the recruitment of a single plant within the action area.

To maintain or improve the status of the woolly-star, occupied areas should be protected and managed to maintain the distribution and increase abundance of the woolly-star. The natural fluvial ecosystem processes necessary to maintain viable, dynamic habitat for woolly-star must also be maintained or restored where feasible within occupied habitat to support woolly-star in the long term. Two woolly-star conservation banks exist on Lytle and Cajon Creeks (Lytle Creek Conservation Bank and Cajon Creek Conservation Bank) near Muscoy, California, as well as a large conservation area (Woolly-Star Preserve Area) associated with the mainstem of the SAR near Redlands, California. Please see the recent 5-year review for more specific information on the species description, habitat affinities, life history, status and distribution, threats, and conservation needs of the woolly-star across its current range (Service 2010), which is available at http://ecos.fws.gov/speciesProfile.

ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR § 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation and the impacts of State and private actions that are contemporaneous with the consultation in progress.

The action area is located in the Cities of San Bernardino and Redlands within the historic floodplain of the SAR. The SAR flows over 100 miles from its headwaters in the San Bernardino Mountains to the Pacific Ocean. The SAR has been highly modified to accommodate urban development (flood control), diversion of flows for agricultural or residential use and diversion for storage (ground water recharge). Hydrological modification and habitat loss play significant roles in the distribution of suitable habitat for both vireo and woolly-star throughout the SAR watershed. Habitat for both vireo and woolly-star is maintained through flood disturbance.

Least Bell's Vireo

The Project area is outside of vireo critical habitat. Currently, the only suitable vireo habitat where vireos were observed during 2012 surveys within the action area is located at the SAR crossing location and in the Mission Zanja Channel (GLA 2012). Suitable vireo habitat does not exist in any of the other water crossing locations. Survey records for the SAR indicate that vireos have been consistently observed over the past two decades in the vicinity of the SAR crossing location (Museum 2002, SBCDPW 2002, MBA 2005, SAWA 2006, and GLA 2012). Generally the area supports 2 or more territories in a given year. Four vireo territories (occupied by three single males and one nesting pair) were recorded in the most recent focused surveys (GLA 2012). Of these, three territories were located west of the SAR crossing location, including one nesting pair located adjacent the Project footprint in the Mission Zanja Channel confluence with the SAR.

Santa Ana River Woolly-Star

Seven Oaks Dam is a Corps-built structure maintained and operated by Orange County Flood Control District as a flood control structure, and located in the foothills of the San Bernardino Mountains on the SAR upstream of the action area. It is operated in tandem with Prado Dam to minimize the risk of flooding to San Bernardino, Riverside, and Orange Counties. Historically, storm-flows maintained woolly-star habitat by thinning perennial vegetation, transporting sediment, and dispersing seeds in the Santa Ana River Watershed. The natural floodplain of the river is a large alluvial fan, but Seven Oaks Dam operations have reduced the frequency and extent of flooding, thus reducing sediment transport and the creation and maintenance of woolly-star habitat. Impacts to woolly-star from Seven Oaks Dam were offset through the creation of the Woolly-star Preserve Area located approximately 5 miles upstream of the action area, where woolly-star can be found in large numbers.

One woolly-star plant was observed in the proposed Project footprint at the SAR crossing location (GLA 2012, HDR 2013b). No other woolly-star plants have been reported in the immediate vicinity of the Project work area. The nearest woolly-star occurrence is located 0.7 miles upstream, so this individual is likely a colonizer dispersed downstream by flood water during a recent storm event.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action, are later in time, and still reasonably certain to occur.

Both vireo and woolly-star occur in the Project footprint. Focused vireo surveys were conducted by Glenn Lukos Associates' biologists on April 16 and 27, May 8 and 21, June 1, 11, and 25, and July 5, 2012. Four vireo territories were identified during the survey period (GLA 2012). One pair was observed exhibiting nesting behavior approximately 150 feet to the south of the Project footprint near the confluence of the SAR and Mission Zanja Channel. This pair was first observed on June 1, 2012 and remained until July 5, 2012. Three individual male vireos were observed at greater distance from the Project area (400 to 500 feet). These were associated with the southern side of the river channel with two territories found west of the Project crossing and one found to the east.

During rare plant surveys, one woolly-star plant was detected within the Project footprint (HDR 2013b). The woolly-star was observed within the temporary impact area of the SAR crossing.

Least Bell's vireo

Direct Effects

Excavation, grading, and disturbance associated with equipment and vehicle access would occur on approximately 5.3 acres along the SAR and Mission Zanja Channel. The Project will result in the destruction of 1.70 acres of riparian habitat used by vireos for breeding, roosting, foraging, and dispersal (HDR 2013b). Since vegetation clearing will be completed outside of the vireo breeding and nesting season when migratory vireos are absent from the area, no eggs, nestlings, or adults will be killed or injured by the proposed Project. Additionally, vegetation removal and other construction activities will be observed by the biological monitor.

Vireos typically return to established breeding territories year after year. We expect one breeding territory within the Project footprint will be partially destroyed as a result of vegetation removal. When vireos return to the Project area to breed, they may be forced to find and compete for habitat elsewhere until suitable riparian vegetation is restored within the riparian corridor. Because suitable habitat will remain downstream and upstream of the Project area, the one affected vireo pair may attempt to use the adjacent habitat. However, these vireos may be subject to the effects of displacement (e.g., delayed breeding, fewer nesting attempts per season or inability to attract a mate, and increased probability of brood parasitism) resulting in an overall reduction in reproductive output (Beck 1996). This is expected to adversely affect the displaced birds, and to some extent may interfere with the mating and rearing success of other vireos as habitat areas become more crowded. If the displaced birds cannot find suitable habitat in which to forage and shelter, we anticipate they will be more vulnerable to predation and may otherwise die or be injured.

Construction noise may negatively affect the behavior of any vireos located in habitat near the Project area. Noise and vibration are thought to be potentially harmful to a variety of bird species (RECON 1990, Pike and Hays 1992, Kaseloo 2006). There are four major categories of noise effects on wildlife: (1) auditory physiological; (2) non-auditory physiological; (3) behavioral; and (4) masking (i.e., interference with the reception of auditory signals because of interfering environmental noise) (Dufour 1980). Masking and interference from noise may affect breeding behaviors and reproductive success (Ward and Stehn 1989, RECON 1990, Barrett 1996, Schroeder *et al*. 2012). If construction and maintenance occur entirely within the non-breeding season (September 16 to March 14), vireos will not be affected by noise, vibration, or human presence from construction activity.

Vireos typically arrive in southern California in mid to late March, with territory establishment and nesting taking place from March through late July (Pike *et al*. 2011). The species usually departs the breeding grounds by the third week of September. If construction occurs during the breeding season, vireos could be affected by construction-related noise and vibration. Measures to avoid and minimize disturbance from noise and construction impacts include seasonal restrictions on vegetation removal and a biological monitor will be present to ensure that a

500-foot buffer is maintained around any vireos present during construction. After vegetation removal in the construction area, vireos may be present up or down stream from construction activity and in riparian habitat adjacent to the SAR crossing location.

Four vireo territories were identified in 2012 (GLA 2012). One nesting pair of vireo was observed approximately 150 feet to the south of the Project footprint near the confluence of the SAR and Mission Zanja Channel. This pair was first observed on June 1, 2012 and remained until July 5, 2012. Three individual male vireos were observed at greater distance from the Project area (400 to 600 feet). All individual male territories were associated with the southern side of the river channel with two territories found west of the Project crossing location and one found to the east. Due to the distance from the Project footprint we do not expect these individual males to be impacted by Project-related activities.

The FTA and Applicant have incorporated avoidance measures to prevent take of vireos adjacent to construction. To offset the loss of currently occupied vireo habitat in the Mission Zanja Channel, and displacement of as many as one pair of vireo, the Applicant will compensate through an in-lieu fee payment to an appropriate conservation bank for the establishment of 3.76 acres of vireo habitat located within the Santa Ana River Watershed prior to the initiation of vegetation removal activities at the SAR crossing. In addition, temporarily impacted areas within the SAR and Mission Zanja Channel will be restored to pre-grade contours following the completion of construction activities. To minimize soil erosion a Service pre-approved native seed mix, including locally occurring shrub and grass species, will be broadcast over the areas via hand-seeding or hydroseeding, and the areas will be allowed to revegetate naturally. These areas will be monitored and maintained for 5 years, until vireo is documented using the re-established habitat or until habitat attains 80 percent cover (shrub and tree canopy). If recruitment of woody riparian plant species is not evident within 2 years of Project construction or habitat has not attained 60 percent cover within 3 years, impacts will be treated as permanent and additional conservation acreage for areas not meeting success criteria shall be provided through in-lieu fee payment to an appropriate conservation bank in the Santa Ana River Watershed at a ratio of 1:1.

Indirect Effects

The Project is expected to result in an increase in rail traffic from five trips per week to 161 trips per week, with a maximum of 2 trips per hour (DOT 2014). Although the increase in rail traffic is substantial, cumulative noise is expected to be below 60 Leq (equivalent continuous noise level) in the riparian vegetation near the tracks, since train speed is expected to average 35 miles per hour and the track is elevated above the vireo habitat in the SAR crossing location (DOT 2014). Lights on trains operating at night are not expected to negatively affect vireo due to the elevation of the track above the vireo habitat. Additionally, vireos are frequently detected near human activities that generate intermittent or background noise and lights (e.g. at or near airports and along roadways, including freeways). We therefore do not expect the increase in rail traffic to limit or otherwise disrupt vireo use of the habitat around the SAR crossing.

Effects on Recovery

According to section 2(b), the primary purposes of the Act are to provide a means whereby the ecosystems upon which listed species depend may be conserved, and to provide a program for the recovery of listed species. Under section 2(c), Congress established a policy requiring all Federal agencies to use their authorities in seeking to recover listed species in furtherance of the purposes of the Act. Consistent with these purposes and Congressional policy, sections 3(5), 4(f), 7(a)(1), the implementing regulations to section 7(a)(2) at 50 CFR § 402.02 and related preamble at 51 FR 19926 (June 3, 1986) generally require Federal agencies to further the survival and recovery of listed species in the use of their authorities. According to these mandates, our analysis below assesses (1) whether the proposed action adequately offsets its adverse effects to the environmental baselines for the vireo, and (2) the extent to which the proposed action would cause "significant impairment of recovery efforts" or adversely affect the "species' chances for survival to the point that recovery is not attainable" (51 FR 19926).

Implementation of the proposed Project will result in the temporary loss of a portion of the foraging and nesting habitat of one breeding pair of vireo. Suitable riparian habitat in the action area will be temporarily reduced but the Project is providing for the conservation and management of 4.5 acres of riparian habitat for the benefit if vireo. Over the long term, the action area should support a similar or potentially higher number of vireo pairs as the baseline condition. The population of vireo on the SAR is increasing and we anticipate that the vireo will be maintained in the action area with no appreciable reduction in the numbers, reproduction, or distribution over time. We conclude that the proposed Project does not impair prospects for vireo recovery.

Santa Ana River woolly-star

Direct Effects

One woolly-star plant within the SAR may be impacted by the proposed Project. The Applicant has proposed a conservation measure in an effort to avoid impacting the woolly-star plant in the construction footprint, which includes the use of exclusionary fencing around the plant to minimize the potential for trampling. If excavation, grading, or the installation of a cofferdam and/or construction work pad cannot avoid the plant, it may be killed. No other woolly-star plants are known from the action area.

A common conservation measure used to offset impacts to plants is the collection and planting of seeds or the vegetative propagation by way of stem cutting from the plants proposed for impact. Woolly star is not known to be propagated by stem cuttings and cross pollination is required to produce viable seeds. The individual that is at risk from the Project is isolated from other woolly-star plants and therefore is not expected to produce many, if any viable seed. It is anticipated that collection and planting of seed from this individual would fail to offset Project impacts. The Applicant has proposed to offset this impact by collecting seeds from woolly-star plants located both up and down stream of the Project area, then distributing the collected seeds

in the temporary impact area where the existing plant is located, followed by 2 years of maintenance (weeding) and monitoring woolly-star establishment.

Adherence to Project limits of construction and implementation of best management practices as described in the conservation measures section of this biological opinion are intended to preclude any direct adverse effects on unidentified plants within the Project footprint.

Indirect Effects

Negative indirect effects to woolly-star resulting from the Project are not anticipated. Changes in hydrology, caused by widening the expanse of the bridge by 70 feet in the SAR crossing location may alter habitats downstream. The longer bridge will have increased capacity, so velocity and scour caused by flood flows are expected to be reduced. The net result is an anticipated benefit to species associated with alluvial deposits, including woolly-star found downstream of the Project area. Although anticipated, the benefit to woolly-star is not anticipated to be measureable.

Effects on Recovery

The individual woolly-star in the Project footprint is a recruiting plant. Although there is low probability that this plant will reproduce successfully, removing the potential for reproduction is harmful to the species. In the SAR the distribution of woolly-star becomes scattered and diffuse downstream (west) of Orange Street in the City of Redlands and into the Riverside County where its current distribution ends. Thus, each plant in the downstream portion of the species' distribution is more important to the species than an isolated individual found located upstream where the population is more aggregated. The isolated plants or small groups of plants in the downstream portion of the range represent "stepping stones" of genetic diversity as well as the opportunity for successful cross pollination. The SAR crossing location is downstream of Orange Street. As such, the loss of the individual plant in the project footprint reduces the potential for crosspollination and genetic exchange up or down stream of the SAR crossing.

The proposed conservation measures for woolly-star would offset this effect by replacing the single plant with a reproductive group of plants that would maintain and improve the distribution of the species in the watershed. This would contribute to recovery of the species by increasing both genetic diversity and numbers of plants in the action area portion of the SAR Watershed.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We are unaware of

any non-Federal actions affecting listed species that are reasonably certain to occur within the Action Area.

CONCLUSION

After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the proposed Redlands Passenger Rail Project with its associated activities, including pre-construction surveys, is not likely to jeopardize the continued existence of the vireo or woolly-star. We reached these conclusions for the following reasons:

1. The Project proposes to impact 1.70 acres of occupied vireo habitat within the SAR and Mission Zanja Channel. This represents a small portion of the available riparian habitat in the immediate vicinity and we do not expect a permanent reduction in the number of vireo in the action area.

2. Substantial efforts will be undertaken to minimize injury and mortality of both vireo and woolly-star in the SAR crossing location during construction activities which includes the installation of noise attenuation structures during the vireo nesting season and fencing to minimize construction impacts to the single woolly-star plant.

3. Permanent impacts to unoccupied suitable vireo habitat and temporary impacts to occupied vireo habitat will be compensated at a ratio of 3:1 (3.30 acres) and temporary impacts to unoccupied suitable habitat will be compensated at a ratio of 2:1 (1.2 acres), for a total of 4.50 acres of vireo habitat. Restoration of temporarily impacted areas in the Project footprint will account for 0.74 acre, with the remainder (3.76 acres) to be purchased through an in-lieu fee payment to an appropriate conservation bank within the Santa Ana River watershed.

4. Seeds from the closest population of woolly-star found upstream of the Project area will be collected and planted in the temporary impact area after grading activities are completed and soils have been re-contoured to pre-Project conditions. Seed harvest shall be limited to no more than 50 percent from any woolly-star plant. Planting of seeds shall be coordinated to occur prior to the first rains of the season, typically during early fall.

5. Woolly-star seedlings will be monitored and maintained for a period of 2 years to maximize successful establishment.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in

any such conduct. Harm is further defined to include significant habitat modification or degradation that actually kills or injures listed wildlife by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is further defined as an intentional or negligent act or omission that creates the likelihood of injury to listed wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and 7(o)(2) of the Act, such incidental take is not considered a prohibited taking under the Act, provided that such taking is in compliance with this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by the Applicant so that they become binding conditions of any permit or grant documents issued to the permittee, as appropriate, for the exemption in section 7(o)(2) to apply. The Applicant has a continuing duty to regulate the activity covered by this incidental take statement. If the Applicant fails to assume and implement the terms and conditions of the incidental take statement or to make them enforceable terms of permit or grant documents, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of the incidental take, the Applicant must report the progress of the action and its impact on the species to the PSFWO as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

Impacts to vireo habitat caused by Project activities will lead to reduced breeding success for vireos in the vicinity of the Project. The estimated level of take for vireo is based on the number of vireo territories in the vicinity of the Project and the amount of vireo habitat that will be impacted. If the amount or extent of incidental take is exceeded (i.e., number of vireo territories affected or amount of habitat impacted), it will trigger reinitiation of consultation.

Take for the Project is exempted as follows:

- Harm to no more than one territory (one pair) of vireo is expected, as defined in 50 CFR § 17.3, due to the direct loss of no more than 1.70 acres of occupied and suitable vireo habitat (HDR 2014b), that includes a significant portion of the potential use area for this pair. These birds are not expected to die but are anticipated to suffer a reduction in fitness and productivity. The reduction in productivity may extend for a period of up to 5 years or until riparian habitat has regrown within temporary impact areas in the Project area.

EFFECT OF TAKE

In the accompanying biological opinion, we have determined the level of anticipated take noted above would not result in an appreciable reduction in the number, distribution, or reproduction of vireo or woolly-star, and is thus not likely to result in jeopardy to the vireo or woolly-star.

REASONABLE AND PRUDENT MEASURES

The FTA and/or the Applicant shall implement the conservation measures included as part of the proposed action analyzed in this biological opinion to minimize the incidental take of vireo. In addition to these conservation measures, we consider the following reasonable and prudent measures are necessary to minimize the effects of incidental take on vireo:

1. The FTA and/or the Applicant shall monitor and report on compliance with the established take thresholds for vireo associated with the proposed action.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the FTA and/or the Applicant shall comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

To implement reasonable and prudent measure number 1 (monitor and report on compliance with established vireo take thresholds), the FTA and/or the Applicant shall:

1.1 Ensure biological monitors meet the standards for a qualified biologist and have been pre-approved by PSFWO for work on this Project.

1.2 If the biological monitor detects impacts to vireo from Project-related activities in excess of that described in the above incidental take statement, the FTA and/or the Applicant, their agents, or the biological monitor will contact the PSFWO immediately.

1.3 The qualified biologist will submit a brief summary report to the PSFWO identifying the number of vireo that observed and any measures that were taken to minimize impacts to vireo. The purpose of this report is to ensure impacts to vireo from the Project do not exceed take thresholds.

DISPOSITION OF SICK, INJURED, OR DEAD SPECIMENS

The Applicant shall notify the PSFWO (see address and phone number below) within 3 working days if any endangered or threatened species is found dead or injured as a direct or indirect result of Project implementation. Notification must include the date, time, and location of the injured animal or carcass, and any other pertinent information. In addition, mark dead animals

appropriately, photograph, and leave the carcass on site; transport injured animals to a qualified veterinarian; and contact the PSFWO regarding the final disposition of any treated animals that survive.

REINITIATION NOTICE

This concludes formal consultation regarding the Project as described in materials submitted to us. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In all instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

For further information about this biological opinion, please contact Kai Palenscar of the PSFWO, 777 E. Tahquitz Canyon Way, Suite 208, Palm Springs, California 92262 at 760-322-2070, extension 208.

Sincerely,

G. Mendel Stewart
Field Supervisor

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